American Cavalier King Charles Spaniel Club, Inc.
Health Survey
2004-2005

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A Collaborative Effort

ACKCSC Charitable Trust,
ACKCSC Health Committee,
Board of Directors and Members, ACKCSC, Inc.,

and

Purdue University School of Veterinary Medicine
Section of Clinical Epidemiology
Dr. Larry Glickman, Head
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I Introduction

There are more than 150 breeds eligible for American Kennel Club (AKC) registration. While each dog breed originated from a relatively small gene pool, selective breeding for desirable physical traits such as height, coat color, and head shape, has produced a canine species that is unique among mammals in its phenotypic diversity, with normal adult body weight ranging from approximately 4 to 180 lbs. This wide disparity in normal body size is associated with great differences in longevity and health between the smaller and larger breeds. For example, there are many diseases that occur with greater frequency in larger dogs such as bone cancer, cardiomyopathy, and hip dysplasia, while periodontal disease tends to be far more common in the smaller breeds. Further evidence for the effect of selective breeding is that mixed breed dogs generally live longer and have a lower incidence of most diseases compared with purebred dogs of the same size. Perhaps the greatest impact of body size is that giant breed dogs usually die before 9 years of age while smaller dogs typically live greater than 12 years with some surviving to over 20 years. For these reasons, the health status of the canine population must be evaluated breed by breed to fully appreciate the general state of health and well-being.

There are few existing sources of data that can be used to assess the health and longevity of purebred dogs. Veterinary hospital based information is available through the national computerized Veterinary Medical Data Base (VMDB) which is housed at Purdue University and contains information on hospital visits for more than five million dogs and cats, both mixed and pure breeds. However, the VMDB primarily includes animals referred to veterinary teaching hospitals in North America, because of severe or life-threatening conditions that are difficult to diagnose and treat in private veterinary practice. Thus, these dogs are not necessarily representative of the general pet population. Two sources of information that are becoming available for canine health studies are the electronic medical records of Banfield the Pet Hospital with >475 hospitals located in 44 states. More than 3 million dogs-visits occur each year at Banfield hospitals and all medical records are stored in a single data warehouse. This rich data base was recently used to measure the rate and type of adverse events that occurred following vaccination of greater than two million dogs and to characterize the frequency and type adverse events following use of ProHeart 6 and other heartworm preventives in approximately one

million dogs. Another source of data that is being more frequently used to determine the pattern of disease in living and dying dogs is pet insurance records of companies like Veterinary Pet Insurance. Formal breed health surveys and genetic screening of some breeds have been conducted to measure the prevalence of suspected genetic diseases and to identify individual animals who might be carriers of these inherited diseases. Few of these health surveys however, have been comprehensive or published in the scientific literature. Also, persons unfamiliar with the principles of research design and statistical data analysis have typically conducted many of these breed surveys.

The breed survey described in this report represents a collaborative effort between the American Cavalier King Charles Spaniel Club and the Clinical Epidemiology Section of the Purdue University School of Veterinary Medicine. The primary objective was to describe the frequency and pattern of occurrence of health related conditions and causes of death in Cavalier King Charles Spaniels (CKCS). A secondary objective was to relate physical traits, diet, environment, and personality of individual animals to certain diseases and longevity. We hope the results of this survey will serve to better familiarize veterinarians and owners with the wonderful CKCS breed and provide CKCS breed clubs nationwide with information for prioritizing future health-related research and disease prevention efforts. It should serve to stimulate further studies on the causes of diseases that affect CKCSs. Personally, it provided me (LG) the opportunity to know the CKCS better and to appreciate the gentle and friendly nature of the breed.

II Methods

The Health Committee of the American Cavalier King Charles Spaniel Club, Inc. (ACKCSC) in collaboration with Dr. Larry Glickman, Dr. Nita Glickman and Dr. Malathi Raghavan, from Purdue University School of Veterinary Medicine developed the questionnaire that was made accessible to CKCS owners through the ACKCSC's website and by direct mailing. In addition to helping develop the health survey, Patti Conroy coordinated communications between Purdue University and individuals of the Club. Each owner was asked

to complete a separate questionnaire for up to five dogs that were alive on January 1, 2001. Usable responses were submitted directly to Purdue University for 566 CKCS by 313 owners.

Information on the questionnaires was coded and entered into a computer database after all owners identifiers were deleted, in order to keep the information confidential. A software application called Epi Info version 6.04 developed by the Centers for Disease Control and Prevention (Atlanta, GA) was used for data entry and The SAS System version 8.2 was used for data analysis. The SAS system is a comprehensive data management and analysis application from the SAS Institute (Cary, NC). A probability (P) value of <0.05 was used as a measure of statistical significance in some of the analyses to test for a possible association between a disease and a potential risk factor such as a particular diet, a chemical exposure, or vaccination. A P value of <0.05 implies that the likelihood of observing the exposure-disease relationship by chance alone was less than one in twenty (i.e., a level widely considered as being statistically significant).

List of Abbreviations / Glossary of Terms

N = Number
% = Percent
SD = Standard Deviation
Puppy $\leq$ 9 months of age
Adult $\geq$ 9 months to 7 years of age
Senior $\geq$ 7 years of age

Section I. Description

Table 1—Information for 313 CKCS Owners

	Owners	
	N	%
Number of CKCSs entered into the study by each owner		
1	188	60.1
2	65	20.8
3	21	6.7
4	11	3.5
5	28	9.0
These 313 owners contributed 566 CKCSs to this survey		
Number of CKCSs living with each owner on January 1, 2001		
None	12	3.8
1	141	45.1
2 – 5	121	38.7
6 – 10	26	8.3
>10	8	2.6
No response	5	1.6
Total number of CKCSs living with 308 owners on January 1, 2001 was 782.		
Number of CKCSs currently living with each owner		
None	10	3.2
1	106	33.9
2 – 5	133	42.5
>5	58	18.6
No response	6	1.9
Total number of CKCSs currently living with 307 owners is 1084.		
Number of years each owner has been associated with CKCSs		
1	2	0.6
2 – 5	64	20.5
6 –10	113	36.1
11 – 20	92	29.4
> 20	31	9.9
No response	11	3.5
Total number of years 302 owners were associated with CKCSs is 3396		

Table 1—Information for 313 CKCS Owners (Cont'd)-Page 2

	Owners	
	N	%
Primary interest of the owner (More than one response per owner possible)		
Companion / pet	281	89.8
Show	118	37.7
Breeder	107	34.2
Obedience	71	22.7
Agility	53	16.9
Therapy	51	16.3
Rescue	47	15.0
Other	11	3.5

Table 2—Background of 566 CKCSs

	N	%
Place where obtained		
Breeder—other home	217	38.3
Breeder—kennel	188	33.2
Breeder—self	121	21.4
Rescue	13	2.3
Pet store	1	0.2
Animal shelter	0	0.0
Other	5	0.9
No response	21	3.7
Primary interest of the breeding (more than one response per CKCS possible)		
Conformation	365	64.5
Companion / pet	164	29.0
Obedience	1	0.2
Tracking / hunting	0	0.0
Agility	0	0.0
Other	2	0.4

Table 3—Country in Which CKCS Spent Most of its Lifetime

	N	%
Country		
USA	460	81.3
Canada	40	7.1
Australia	20	3.5
United Kingdom	18	3.2
France	9	1.6
New Zealand	1	0.2
No response	18	3.2

Table 4—State in the USA in Which CKCS Spent Most of its Lifetime

	N	%
Alabama	2	0.4
Arizona	3	0.7
California	64	13.9
Colorado	7	1.5
Connecticut	7	1.5
District of Columbia	1	0.2
Delaware	1	0.2
Florida	28	6.1
Georgia	9	2.0
Hawaii	1	0.2
Illinois	21	4.6
Kansas	1	0.2
Kentucky	5	1.1
Louisiana	1	0.2
Massachusetts	6	1.3
Maryland	6	1.3
Maine	1	0.2
Michigan	13	2.8
Minnesota	4	0.8
Missouri	6	1.3
Montana	2	0.4
North Carolina	20	4.3
Nebraska	2	0.4
New Jersey	21	4.6
Nevada	5	1.1
New York	35	7.6
Ohio	21	4.6
Oklahoma	2	0.4
Oregon	6	1.3
Pennsylvania	12	2.6
Rhode Island	1	0.2
Tennessee	7	1.5
Texas	19	4.1
Virginia	9	2.0
Vermont	3	0.6
Washington	30	6.5
Wisconsin	15	3.3
No response	63	13.7
Total	460	100.0

Table 5—Vital Status of CKCSs

	N	%
Alive as of January 1, 2001	566	100.0
Bitches	345	60.9
Dogs	221	39.1
Vital status as of February 1, 2005 (study end)		
Bitches	345	100.0
Alive	294	85.2
Died	51	14.8
Death by euthanasia	25	7.3
Dogs	221	100.0
Alive	184	83.3
Died	37	16.7
Death by euthanasia	15	6.8
Cause of death diagnosed by a veterinarian	66	75.0 % of 88 deaths
Bitches	37	72.6
Dogs	29	78.4
Necropsy performed	3	3.4 % of 88 deaths
Bitches	2	3.9
Dogs	1	2.7

Table 6—Age of CKCSs

	N	Mean years	± SD
Age as of January 1, 2001 (Survey start date)	566	4.1	3.2
Bitches	345	3.9	3.2
Dogs	221	4.4	3.3
Age as of February 1, 2005 if alive (Survey end date)	478	7.4	2.6
Bitches	294	7.2	2.5
Dogs	184	7.6	2.6
Age at death	88	10.7	2.9
Bitches	51	10.5	2.9
Euthanized	25	10.8	2.5
Not euthanized	26	10.3	3.2
Dogs	37	10.9	3.0
Euthanized	15	10.4	3.1
Not euthanized	22	11.2	2.9

Figure 1—Distribution of Age by Gender as of February 1, 2005

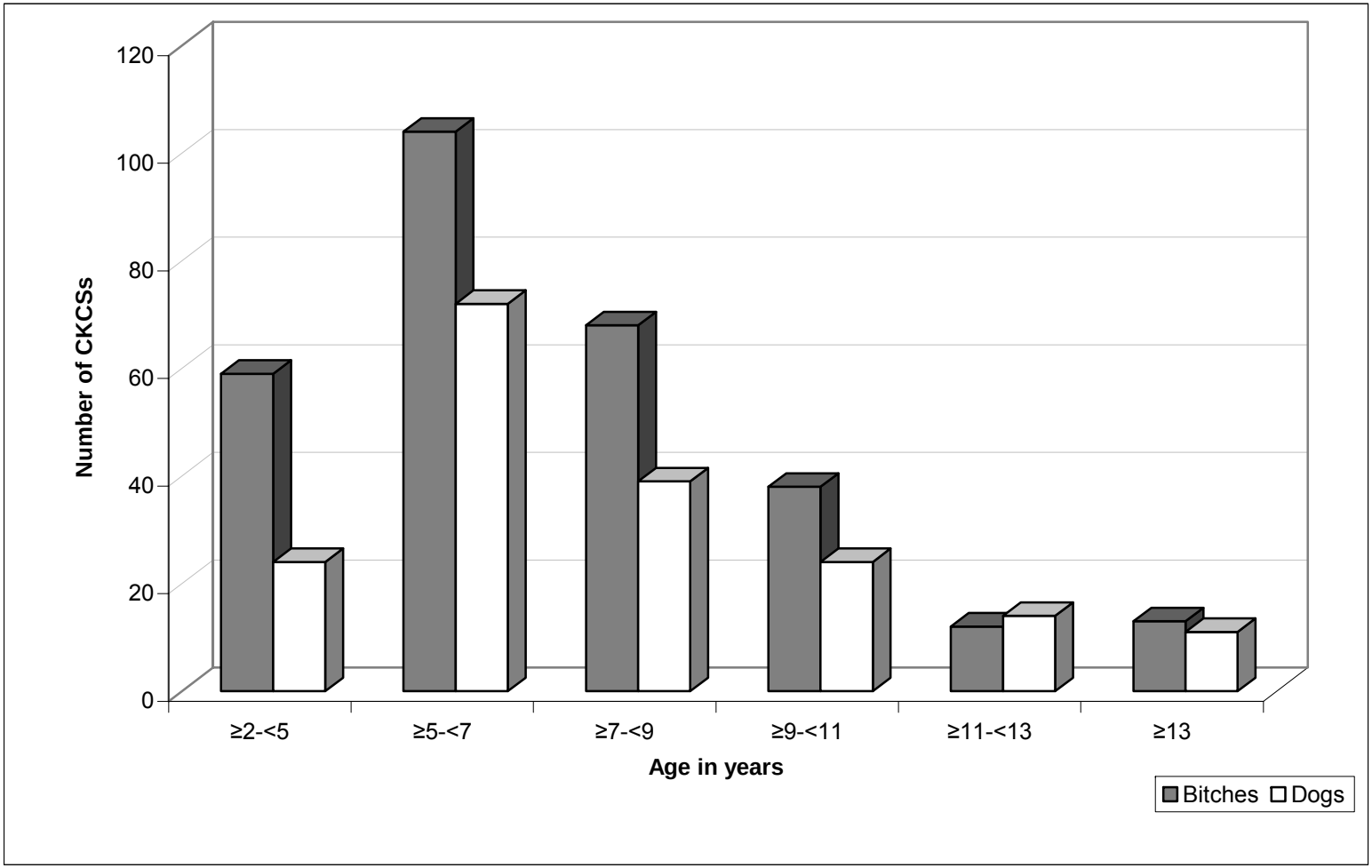


Figure 2—Distribution of Age at Death by Gender

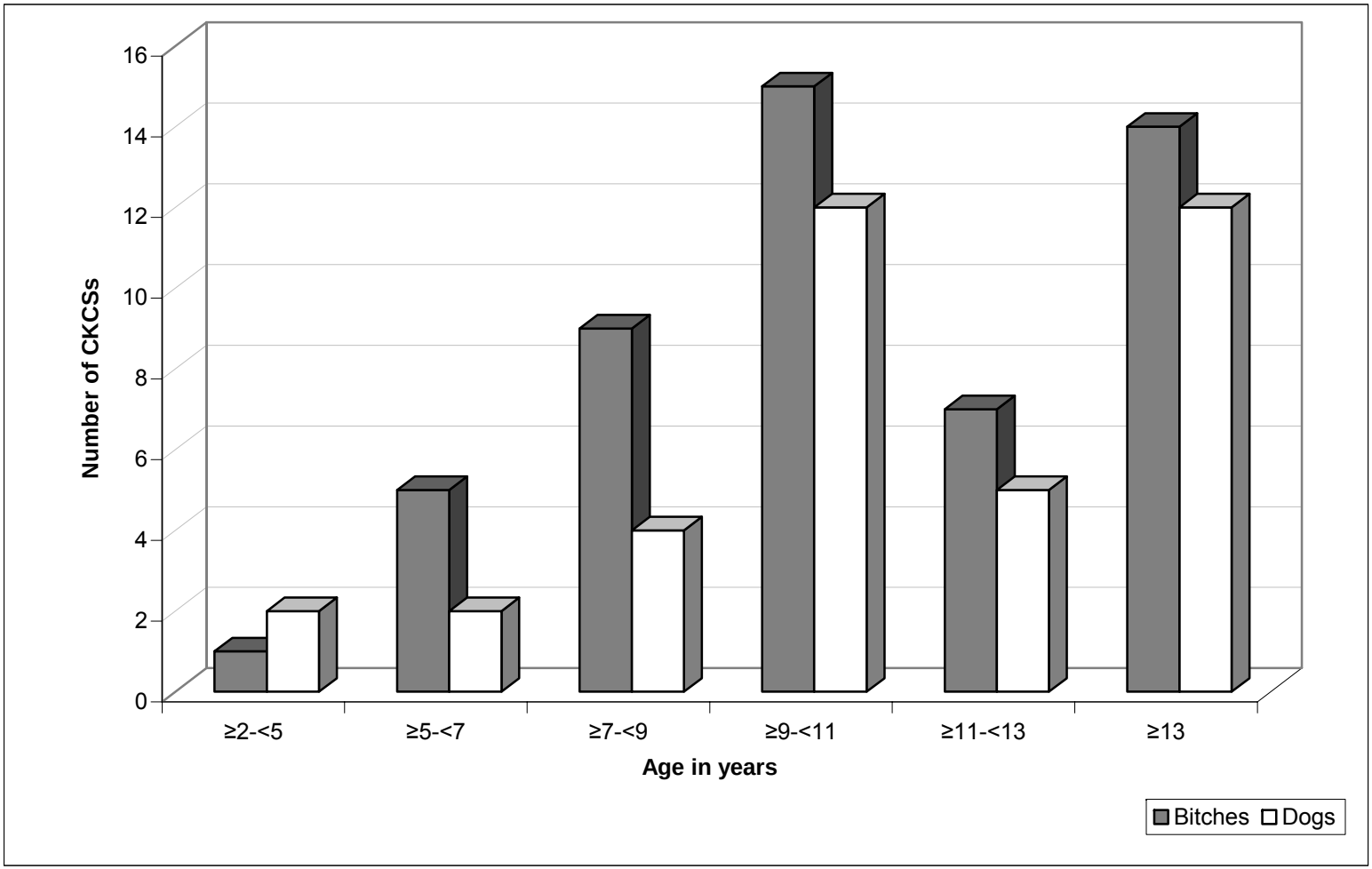


Table 7—Activities Participated In by CKCSs

	N	%	Number of events in a typical year		
			Range	Mean	± SD
Events*					
None	254	44.9	--	--	--
Field events	1	0.2	2.0, 2.0	2.0	--
Agility trials	47	8.3	1.0, 40.0	12.0	9.0
Obedience trials	47	8.3	1.0, 30.0	8.2	7.8
Tracking tests	1	0.2	1.0, 1.0	1.0	--
Conformation shows	244	43.1	1.0, 100.0	12.0	12.6
Pet therapy visits	51	9.0	1.0, >365.0†	30.4	60.9
Other	12	2.1	1.0, 52.0	15.6	18.0

* More than one response per CKCS possible
† One CKCS participated in therapy visits daily

Table 8—Housing and Management of CKCSs

	N	%
Primary housing type (> 50% of the time)		
Free in house	457	80.7
In a crate in the house	57	10.1
Kennel (indoor)	12	2.1
Kennel (inside/outside)	15	2.7
Kennel (outside)	1	0.2
Fenced yard	7	1.2
Other (including free in selected areas of house)	15	2.7
No response	2	0.4
Sleeps in owner's bed		
Never	126	22.3
Sometimes	166	29.3
Usually	74	13.1
Always	189	33.4
No response	11	1.9

Table 9—Body Mass Index (Weight/Height) of CKCSs by Age and Gender

	N	Mean	± SD
All	362	1.4	0.2
Bitches	229	1.4	0.2
Dogs	133	1.4	0.2
Unknown / missing	204		
Ages 0 - 8 years	228	1.3	0.2
Bitches	150	1.3	0.2
Dogs	78	1.4	0.2
Unknown / missing	106		
Ages 8+ years	134	1.4	0.2
Bitches	79	1.3	0.2
Dogs	55	1.5	0.2
Unknown / missing	98		

Figure 3—Distribution of Heights of CKCS by Gender

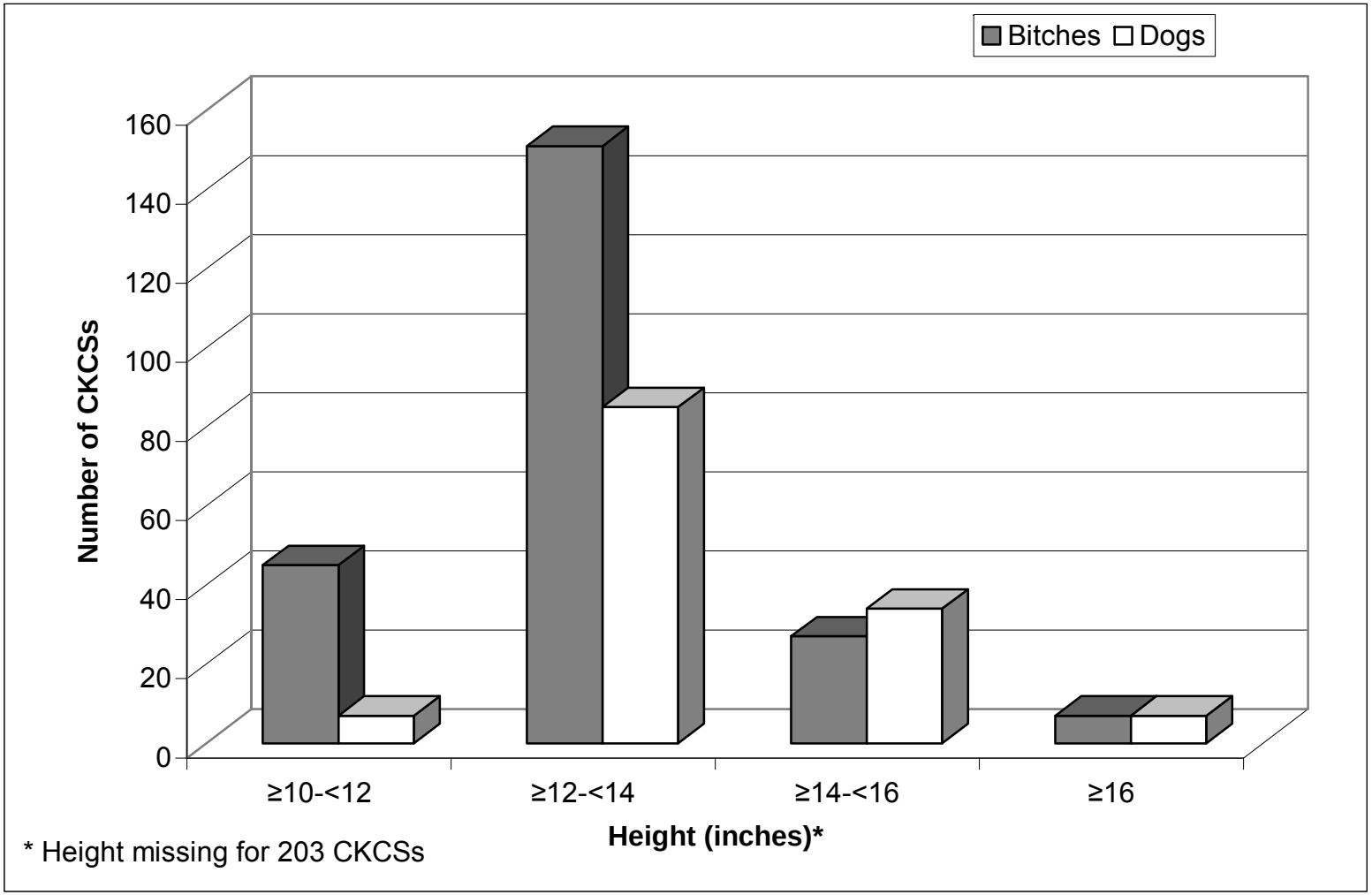


Figure 4—Distribution of Weights of CKCS by Gender

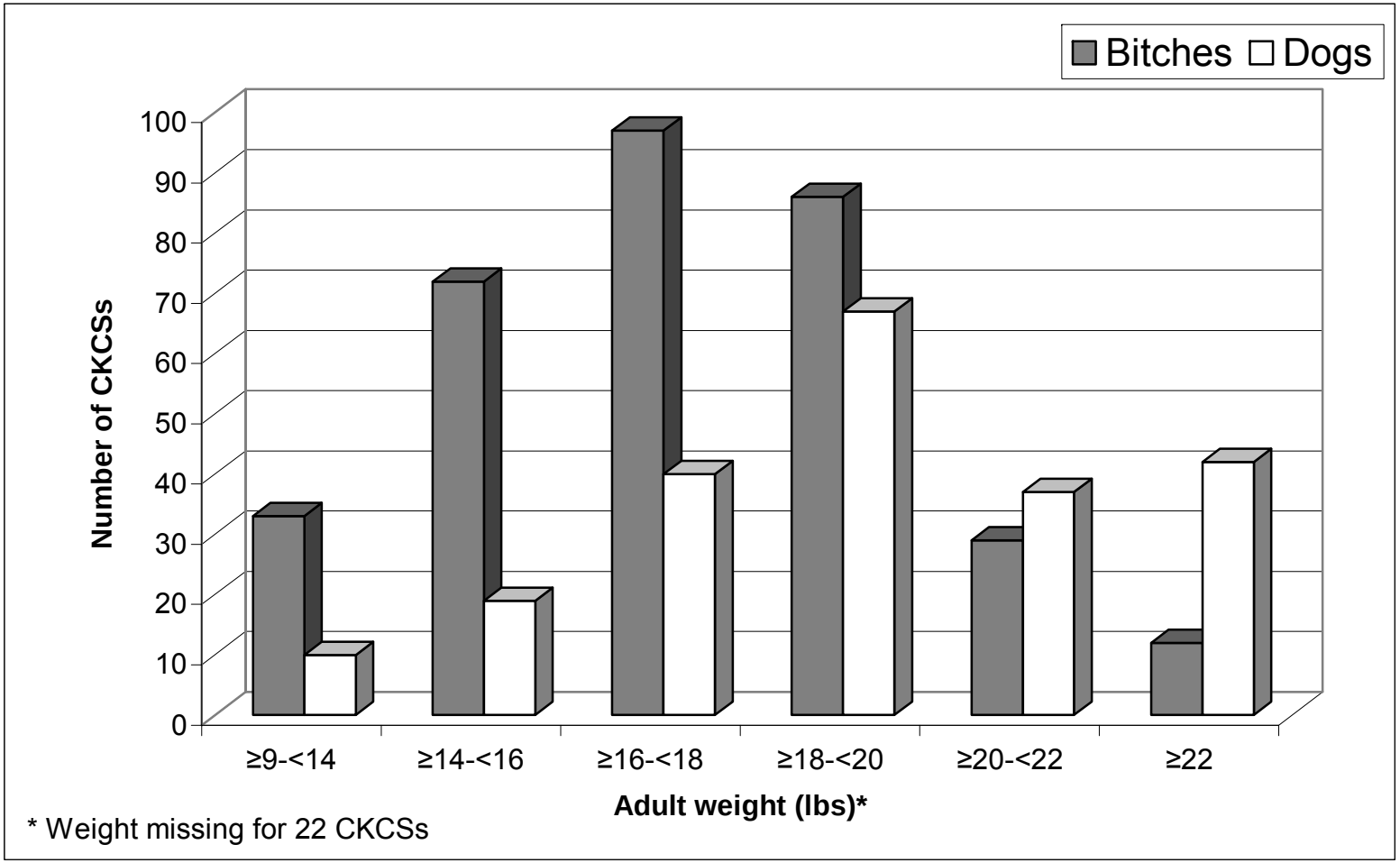


Figure 5—Distribution of Body Mass Index (Weight/Height) of CKCS by Gender

Table 10—Body Measurements of CKCSs [a]

Bitches

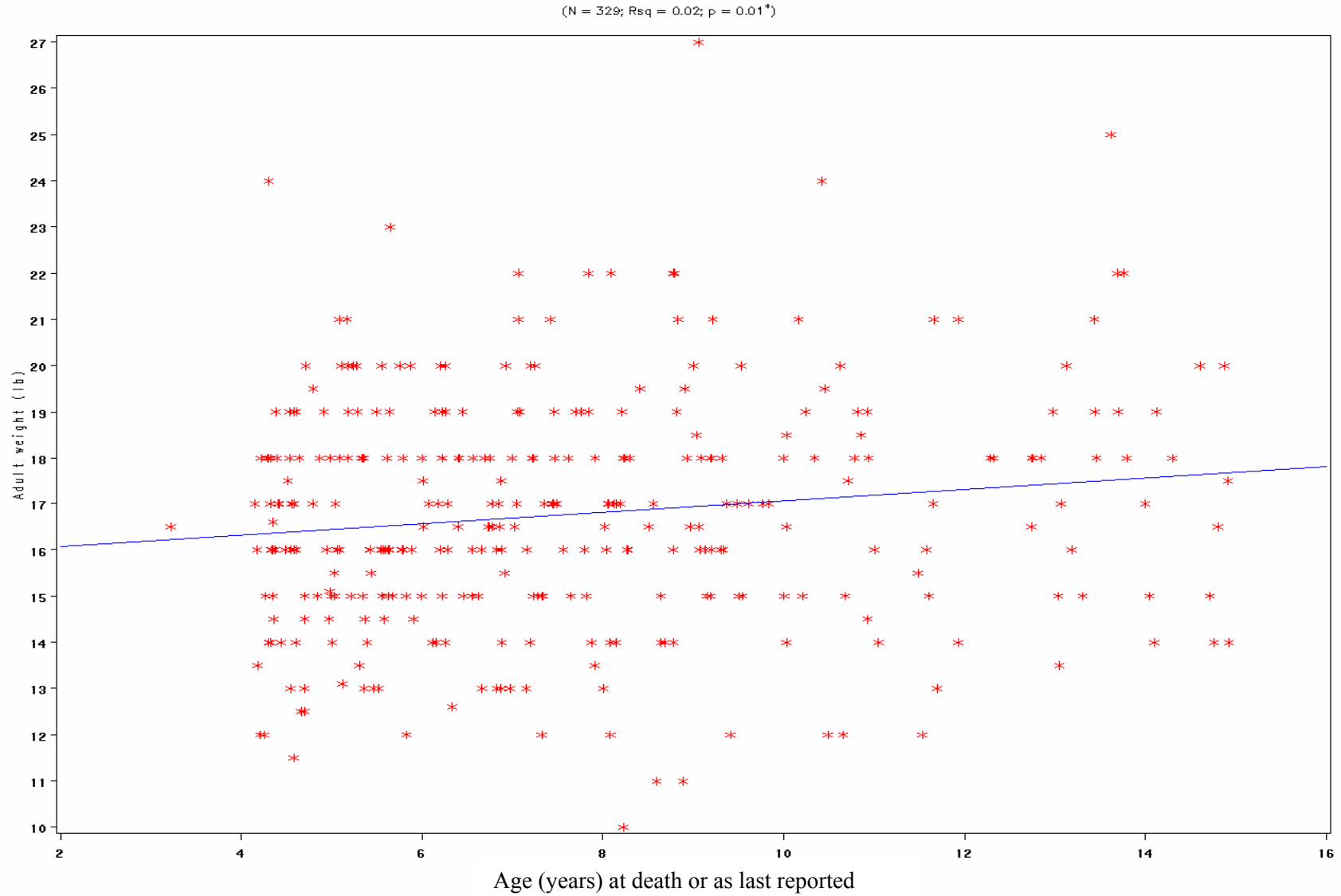
	Weight[c] (lb)		Height[c] (in)		Weight/Height Index	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Age[b] (years)						
4 – 4.9	58	16.2±2.3	44	12.4±1.1	44	1.3±0.2
5 – 6.9	106	16.6±2.2	80	12.3±0.9	80	1.3±0.1
7 – 8.9	73	16.8±2.8	48	12.6±1.2	48	1.3±0.2
9+	92	17.3±2.8	58	12.9±1.8	57	1.4±0.2

Dogs

	Weight[c] (lb)		Height[c] (in)		Weight/Height Index	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Age[b] (years)						
4 – 4.9	26	17.9±4.1	16	13.2±2.1	16	1.3±0.2
5 – 6.9	72	18.8±3.8	46	13.4±1.1	46	1.4±0.2
7 – 8.9	41	18.9±2.5	30	13.4±1.2	30	1.4±0.2
9+	76	19.5±3.4	41	13.2±1.1	41	1.4±0.2

[a] Numbers do not total to 345 bitches and 221 dogs due to missing information
[b] Age as of February 1, 2005, or age at death.
[c] Weight and height as of February 1, 2005, or as last reported.

Figure 6—Relationship of Body Weight to Age in CKCS Bitches



*The probability that this relationship occurred by chance alone is 1 in 100

Figure 7—Relationship of Body Weight to Age in CKCS Dogs

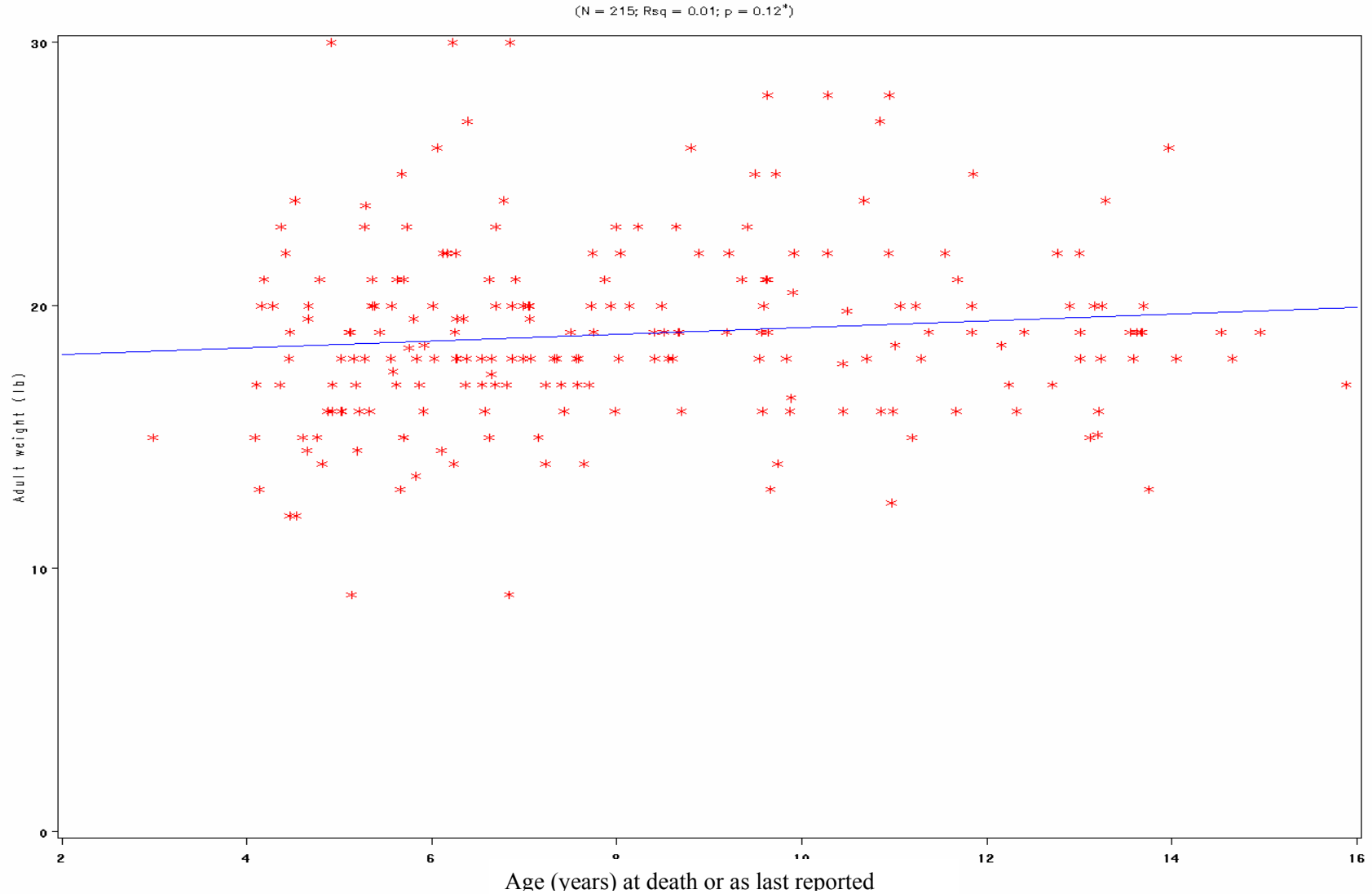


Table 11—Rate of Growth, Body Condition, and Bone Type

	Lifestage			
	Puppy		Adult	
	N[a]	%	N[a]	%
Growth rate as puppy				
Slow	15	2.7	--	--
Average	426	75.3	--	--
Maximum	10	1.8	--	--
Body condition				
Bitches				
Underweight	24	7.0	3	0.9
Average	296	85.8	301	87.3
Overweight/obese	3	0.9	37	10.7
Dogs				
Underweight	23	10.4	9	4.1
Average	183	82.8	190	86.0
Overweight/obese	1	0.5	20	9.1
Bone type				
Bitches				
Small	--	--	65	18.8
Medium	--	--	229	66.4
Large	--	--	47	13.6
Dogs				
Small	--	--	13	5.9
Medium	--	--	146	66.1
Large	--	--	60	27.2

[a] May not add up to 345 bitches and 221 dogs due to unanswered or unknown information

Table 12—Owner's Assessment of Growth and Body Condition in CKCS Bitches [a]

	Adult weight[b] (lb)		Adult height[b] (in)		Adult Weight/Height Index	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Desired puppy growth rate						
Slow	8	15.9±2.0	9	12.1±0.6	8	1.3±0.1
Average	261	16.7±2.4	191	12.5±1.3	191	1.3±0.2
Maximum	7	16.3±3.8	4	12.4±1.3	4	1.2±0.2
Puppy body condition						
Underweight	22	15.4±1.8	18	12.3±1.3	18	1.3±0.2
Average	287	16.8±2.6	199	12.5±1.3	198	1.3±0.2
Overweight	3	16.3±1.5	1	12.0	1	1.3
Adult body condition						
Underweight	2	17.0±2.8	2	13.5±2.1	2	1.3±0.01
Average	289	16.5±2.3	204	12.4±1.1	203	1.3±0.2
Overweight/obese	37	19.1±3.3	23	13.2±2.1	23	1.4±0.2
Adult bone structure						
Small	61	14.9±2.0	41	12.4±1.3	40	1.2±0.2
Medium	220	16.7±2.1	163	12.4±1.1	163	1.3±0.2
Large	46	19.6±2.6	25	13.4±2.0	25	1.4±0.2

[a] Numbers do not total to 345 bitches due to missing information
[b] Weight and height as of February 1, 2005, or as last reported.

Table 13—Owner's Assessment of Growth and Body Condition in CKCS Dogs [a]

	Adult weight[b] (lb)		Adult height[b] (in)		Adult weight/height Index	
	N	Mean±SD	N	Mean±SD	N	Mean±SD
Desired puppy growth rate						
Slow	6	19.3±6.6	5	12.6±1.1	5	1.4±0.3
Average	156	19.1±3.3	98	13.4±1.4	98	1.4±0.2
Maximum	3	20.3±4.7	3	13.9±1.9	3	1.5±0.2
Puppy body condition						
Underweight	21	15.9±3.2	13	12.5±0.7	13	1.3±0.2
Average	181	19.3±3.4	113	13.4±1.4	113	1.4±0.2
Overweight	1	24.0	1	14.0	1	1.7
Adult body condition						
Underweight	8	15.5±1.8	4	12.6±0.5	4	1.2±0.2
Average	187	18.7±3.2	118	13.3±1.3	118	1.4±0.2
Overweight/obese	20	22.7±4.1	11	13.9±0.9	11	1.6±0.2
Adult bone structure						
Small	13	15.5±2.5	6	13.0±1.5	6	1.1±0.1
Medium	143	18.3±3.0	88	13.1±1.2	88	1.4±0.2
Large	59	21.3±3.5	39	13.9±1.2	39	1.5±0.2

[a] Numbers do not total 221 dogs due to missing information
[b] Weight and height as of February 1, 2005, or as last reported

Table 14—Reproductive Status

	N (%)	Age at neutering, years		
		Median	Mean	± SD
Neutered	386 (68.2)	1.9	3.1	2.9
Bitches	242 (70.1)	3.3	3.7	3.1
Dogs	144 (65.2)	0.8	1.9	2.1
Unknown / missing	5 (0.9)			

Figure 8—Distribution of adult body weight by gender and neuter status

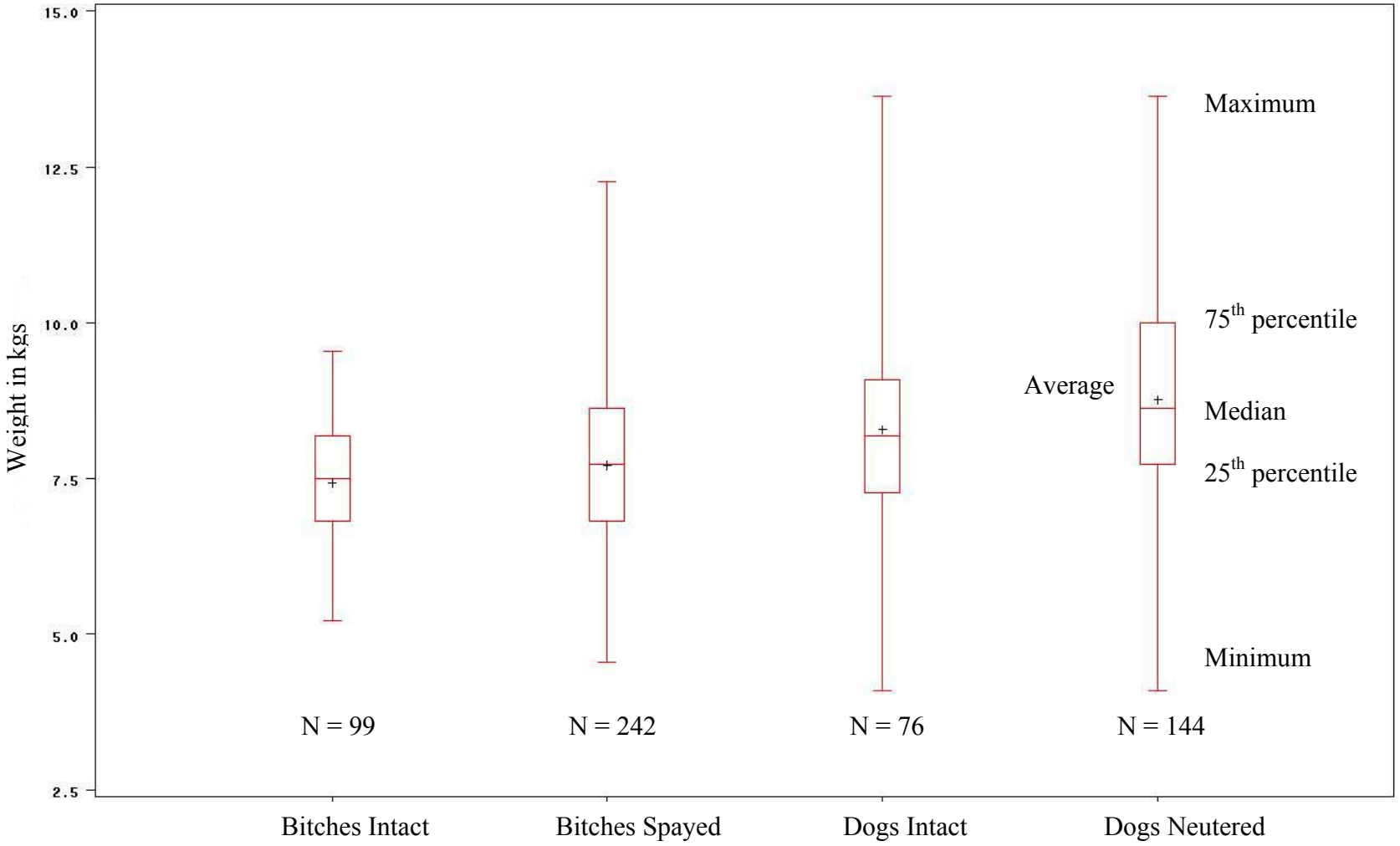


Figure 9—Distribution of adult body weight by age and gender

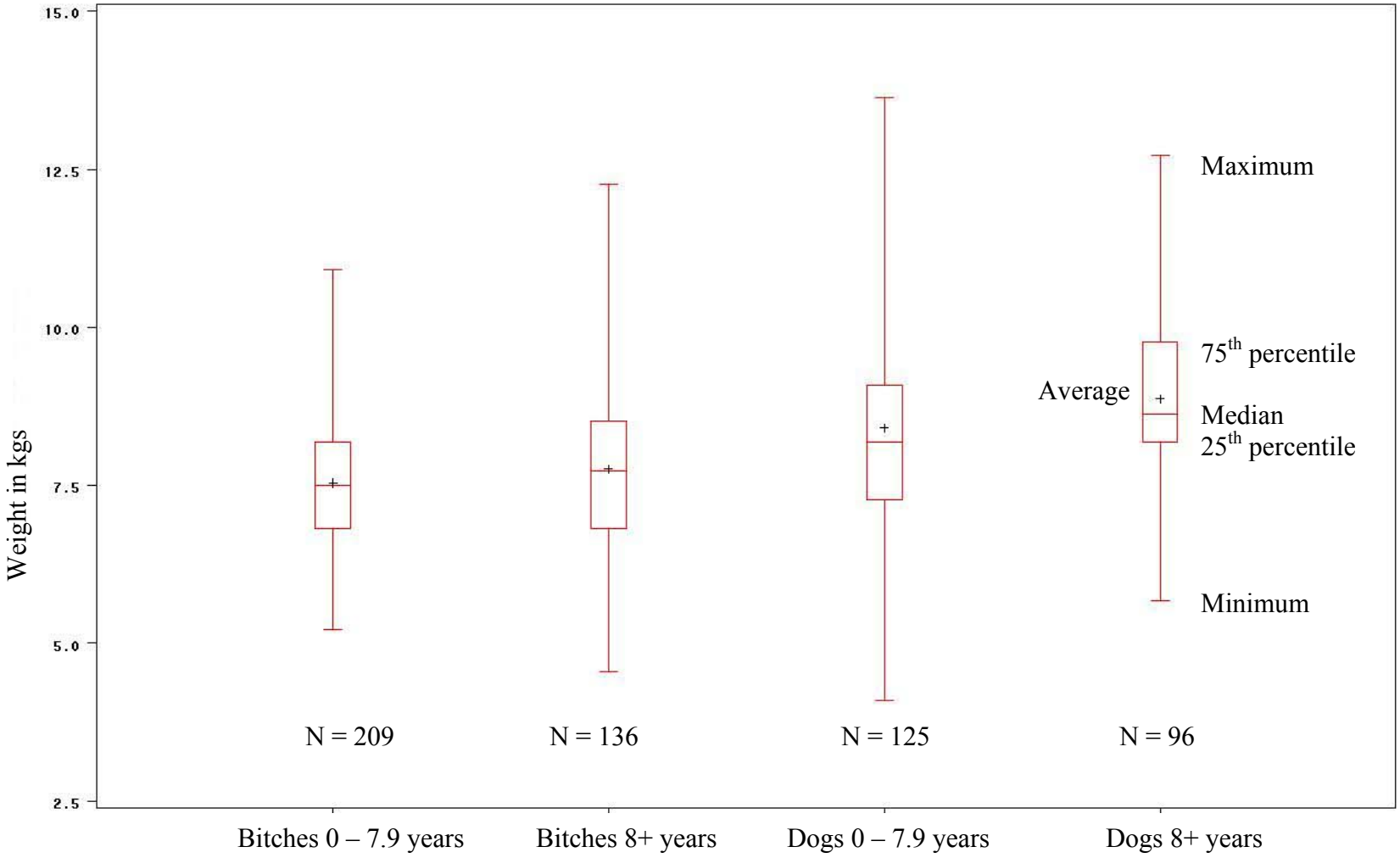


Figure 10—Distribution of adult body weight by age, gender and neuter status

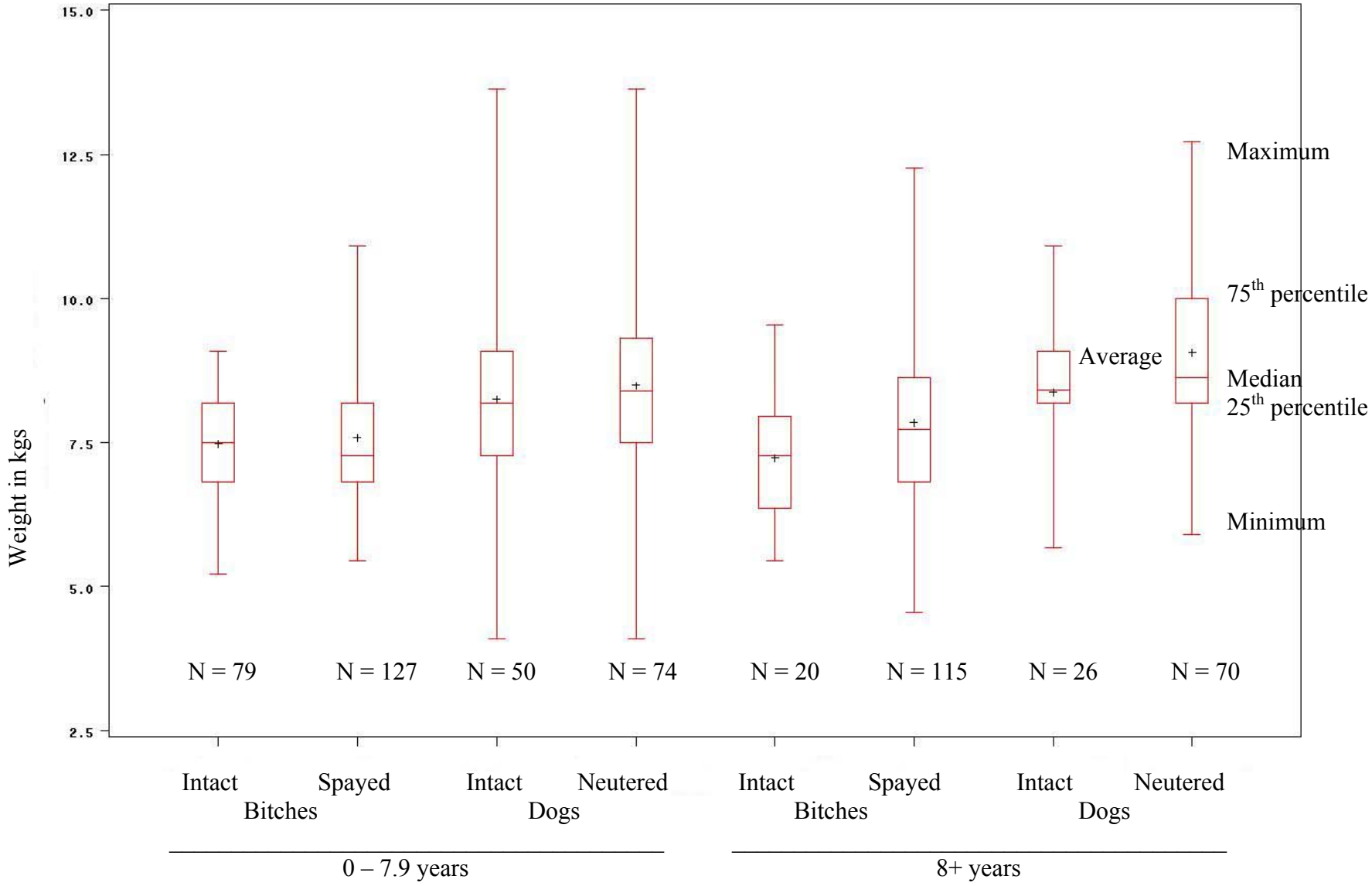


Table 15—Reproductive Performance of 566 CKCS

	N	%
CKCS ever bred	275	48.6
Bitches	206	59.5
Dogs	69	31.4

* Of the 206 bitches bred, 199 (96.6%) had whelped.

Table 16—Reproductive Performance of 345 CKCS Bitches

Number of bitches that whelped	Total no. litters	Bitches				
		N	%			
	0	147	42.5			
	1	48	13.9			
	2	53	15.3			
	3	40	11.6			
	4	31	9.0			
	5	15	4.3			
	6	5	1.5			
	Unknown	7	2.0			
Bitches	**Litter order**	**Bitches N***		**Median**	**Mean**	**±SD**
				Age at whelp (years)		
	1	192		2.5	2.8	1.2
	2	144		3.6	3.8	1.4
	3	91		4.5	4.8	1.2
	4	51		5.3	5.6	1.2
	5	20		5.9	6.0	1.2
	6	5		8.1	7.9	1.3
Live born	**Litter order**	**Litters N***		**Pups per litter**		
	1	189		4.0	3.7	1.8
	2	143		4.0	4.3	1.7
	3	89		4.0	4.2	1.9
	4	49		4.0	4.2	1.8
	5	20		3.0	3.1	1.8
	6	5		2.0	2.0	0.7
Stillborn	**Litter order**	**Litters N***		**Pups per litter**		
	1	150		0	0.5	0.8
	2	113		0	0.5	0.9
	3	63		0	0.4	0.8
	4	30		0	0.3	0.4
	5	9		0	0.4	0.7
	6	3		0	0.3	0.6

* Indicates number with reported information

Table 16—Reproductive Performance of 345 CKCS Bitches (Cont'd)—Page 2

Weaned	Litter order	Litters N*	Median	Mean	±SD
			Pups per litter		
	1	182	3.0	3.5	1.8
	2	139	4.0	4.1	1.6
	3	86	4.0	4.0	1.8
	4	49	4.0	4.0	1.9
	5	20	3.0	3.1	1.7
	6	5	2.0	2.0	0.7

Table 17—Reproductive Performance by Method of Insemination

Method of Insemination	Litter order	Number of litters	Number live born pups per litter		
			Median	Mean	±SD
Natural					
	1	165	4.0	3.7	1.8
	2	123	4.0	4.4	1.7
	3	76	4.0	4.3	2.0
	4	45	4.0	4.3	1.8
	5	17	3.0	3.2	1.9
	6	5	2.0	2.0	0.7
Artificial—Fresh semen					
	1	20	4.0	3.5	1.5
	2	18	4.5	4.2	1.2
	3	11	4.0	4.3	1.2
	4	5	4.0	3.4	1.5
	5	2	2.0	2.0	1.4
	6	0	--	--	--
Artificial—Chilled semen					
	1	5	3.0	3.2	2.3
	2	2	2.5	2.5	0.7
	3	2	2.5	2.5	2.1
	4	0	--	--	--
	5	1	3.0	3.0	--
	6	1	2.0	2.0	--
Unknown					
	1	4	4.5	4.5	2.1
	2	1	*	*	*
	3	2	1.0	1.0	--
	4	1	*	*	*
	5	0	--	--	--
	6	0	--	--	--

* Not reported

Table 18—Reproductive Performance by Method of Insemination

Method of insemination	Number of bitches	Number of litters	Number of pups per litter		
			Median	Mean	±SD
Natural	176	431			
Live born			4.0	4.0	1.9
Stillborn			0	0.4	0.8
Weaned			4.0	3.8	1.8
Artificial—Fresh semen	41	56			
Live born			4.0	3.8	1.4
Stillborn			0	0.4	0.7
Weaned			4.0	3.8	1.3
Artificial—Chilled semen	8	11			
Live born			3.0	2.8	1.7
Stillborn			0	0.2	0.4
Weaned			2.0	2.7	1.7
Unknown	5	8			
Live born			3.0	3.3	2.5
Stillborn			0	0	--
Weaned			6.0	6.0	--

Table 19—Coat Color of CKCSs

	N	%
Black & tan	39	6.9
Ruby	48	8.5
Tricolor	151	26.7
Blenheim	328	58.0

Table 20—Personality Scores [a] of CKCSs

	Mean ± SD
Personality trait	
Active	6.4±1.9
Excitable	5.1±2.0
Aggressive to dogs	2.2±1.9
Aggressive to people	1.3±1.0
Possessive / territorial	2.6±2.0
Submissive to dogs	3.7±2.5
Submissive to people	4.2±3.0
Fearful of people	1.9±1.7
Fearful of environmental change	2.8±2.4
Obsessive compulsive disorder	1.8±1.7
Fly catchers syndrome	1.3±1.3
Happy	8.7±1.4
Trainable	8.0±1.8

[a] Possible scores are 1 – 10 where 1 = never (low)…10 = always (high).

Table 21—Personality Score[a] as Characterized by Owners for CKCS vs Irish Setters, Golden Retrievers and Akitas

	CKCS N = 566	Irish Setter[b] N = 565	Golden Retriever[b] N = 1442	Akita[b] N = 603
	Mean ± (SD)	Mean ± (SD)	Mean ± (SD)	Mean ± (SD)
Personality trait				
Active / energetic	**6.4 (1.9)**	7.2 (1.8)	6.9 (1.9)	6.3 (2.1)
Aggressive to dogs	**2.2 (1.9)**	2.5 (2.0)	2.4 (2.0)	4.9 (2.9)
Aggressive to people	**1.3 (1.0)**	1.4 (1.2)	1.3 (0.9)	2.0 (1.6)
Excitable	**5.1 (2.0)**	5.9 (2.1)	5.6 (2.2)	5.3 (2.3)
Happy	**8.7 (1.4)**	9.1 (1.2)	9.0 (1.3)	8.6 (1.6)
Submissive to dogs	**3.7 (2.5)**	3.5 (2.5)	3.4 (2.5)	2.9 (2.3)
Submissive to people	**4.2 (3.0)**	4.4 (3.3)	4.2 (3.2)	5.3 (3.0)
Trainable	**8.0 (1.8)**	8.6 (1.6)	8.5 (1.7)	7.8 (1.9)

[a] Possible scores are 1 – 10 where 1 = never (low)…10 = always (high).
[b] Based on previous breed health surveys

Section II. Diet and Body Measurements

Table 22—Usual Diet of 566 Adult CKCSs

Foods fed	Frequency of feeding							
	Daily		Weekly		Monthly		Never	
	N	%	N	%	N	%	N	%
Dry	492	86.9	6	1.1	5	0.9	63	11.1
Canned	98	17.3	19	3.4	11	1.9	438	77.4
Home prepared	167	29.5	46	8.1	8	1.4	345	61.0
Table scraps	50	8.8	58	10.2	8	1.4	450	79.5
Other*	99	17.5	25	4.4	0	0.0	442	78.1

* Includes fresh and frozen raw meats, specialty dog diets, treats.

Table 23—Number of Meals Fed Daily to CKCSs

Food type	Number of meals	Adults	
		N	%
Dry		492	100.0
	1	131	26.6
	2	228	46.3
	3	8	1.6
	5	2	0.4
	Unspecified	123	25.0
Canned		98	100.0
	1	35	35.7
	2	27	27.6
	3	1	1.0
	Unspecified	35	35.7
Home prepared		167	100.0
	1	50	29.9
	2	56	33.5
	3	2	1.2
	5	1	0.6
	Unspecified	58	34.7
Table scraps		50	100.0
	1	25	50.0
	2	1	2.0
	3	3	6.0
	Unspecified	21	42.0
Other		99	100.0
	1	44	44.4
	2	22	22.2
	3	5	5.1
	Unspecified	28	28.3

Table 24—The Brands of Dry Foods Fed

Brand name*	N	%	Rank
Back to Basics	2	0.4	
BilJac	4	0.8	
Breeders' Choice	4	0.9	
California Natural	10	2.1	
Canidae	58	12.3	2
Canine Zone	3	0.6	
Diamond	4	0.9	
Dick Van Patten's	1	0.2	
Dr. Foster & Smith	2	0.4	
Eagle	13	2.8	
Eukanuba	59	12.5	1
Flint River Ranch	4	0.9	
Fromm	3	0.6	
Hill's Science Diet	58	12.3	2
Iams	24	5.1	
Innova	14	3.0	
Innovative Veterinary Diet	2	0.4	
Kibble & Bits	3	0.6	
Kirkland	8	1.7	
Natural Balance	13	2.8	
Natural Choice	3	0.6	
Nature's Recipe	9	1.9	
Nutro	30	6.4	4
Pedigree	12	2.6	
Pet Valu	5	1.1	
PHD	4	0.9	
Pinnacle	3	0.6	
Precise	3	0.6	
Pro Plan	10	2.1	
Purina	28	5.9	
Royal Canin	29	6.2	5
Solid Gold	17	3.6	
Waltham	3	0.6	
Wellness	9	1.9	
Wysong	2	0.4	
Other	14	2.8	
Total	471	100.0	

* Brand information not reported for 32 CKCSs that were fed dry food

Table 25—The Brands of Canned Foods Fed

Brand name*	N	%	Rank
Butchers	2	1.7	
California Natural	2	1.7	
Canidae	7	6.0	4
Eagle Pack	4	3.5	
Eukanuba	1	0.9	
Hill's Science Diet	11	10.3	3
Iams	7	6.0	4
Innovative Veterinary Diet	2	1.7	
Kirkland Signature	2	1.7	
Masterfoods	2	1.7	
Mighty Dog	2	1.7	
Nature's Recipe	6	5.2	
Neura	3	2.6	
Nutro	2	1.7	
Pedigree	35	30.2	1
Safeway Select	2	1.7	
Tripett	13	11.2	2
Wellness	3	2.6	
Other	9	7.7	
Total	115	100.0	

* Brand information not reported for 13 CKCS that were fed canned food

Table 26—First Ingredients Listed on the Label of Commercial Foods Fed Daily

Foods fed	N	%
Dry*	375	100.0
White meat	172	45.9
Red meat	116	30.9
Plant origin	73	19.5
Fish or fish meal	5	1.3
Other	9	2.4
Canned†	101	100.0
White meat	39	38.6
Red meat	25	24.8
Meat by products	10	9.9
Plant origin	2	2.0
Other	25	24.8

* Label ingredients missing for 128 CKCSs that were fed dry food
† Label ingredients missing for 27 CKCSs that were fed canned food

Table 27—Most Commonly Fed Home Prepared Foods[a]

	First		Second	
	N	%	N	%
White meat	111	38.4	60	25.8
Red meat	81	28.0	36	15.5
Other meat	1	0.4	10	4.3
Vegetables	60	20.8	46	19.7
Dairy	7	2.4	7	3.0
Eggs	5	1.7	21	9.0
Yogurt	4	1.4	4	1.7
Fruit	4	1.4	10	4.3
Bones	3	1.0	16	6.9
Fish	2	0.7	5	2.2
Pasta	1	0.4	5	2.2
Other	10	3.5	13	5.6
Total	289	100.0	233	100.0

Table 28—Usual Supplements Given to 566 Adults

Supplements	Daily		Weekly		Monthly		Never	
	N	%	N	%	N	%	N	%
Vitamins	202	35.9	26	4.6	3	0.5	335	59.2
Minerals	54	9.5	13	2.3	1	0.2	498	88.0
Cartilage / joint	112	19.8	6	1.1	0	0.0	448	79.2
Food supplements	111	19.6	14	2.5	7	1.2	434	76.7
Other	73	12.9	3	0.5	1	0.2	489	86.4

Table 29—Daily Diet Compared with Body Condition of Adults

Type of Diet	Body Condition[a]					
	Underweight		Average		Overweight/obese	
	N	%	N	%	N	%
Dry						
Yes	10	83.3	423	86.2	55	96.5
No	2	16.7	68	13.9	2	3.5
Canned						
Yes	3	25.0	85	17.3	8	14.0
No	9	75.0	406	82.7	49	86.0
Home prepared						
Yes	5	41.7	146	29.7	15	26.3
No	7	58.3	345	70.3	42	73.7
Table scraps						
Yes	0	0.0	41	8.4	8	14.0
No	12	100.0	450	91.7	49	86.0
Other						
Yes	4	33.3	87	17.7	9	15.8
No	8	66.7	404	82.3	48	84.2

[a] Body condition missing for 16 CKCSs

Table 30—Daily Diet Compared with Weight and Height in Adult Bitches

Type of Diet	Weight[a]			Height[a]			Weight/Height		
	N	Mean ± (SD)		N	Mean ± (SD)		N	Mean ± (SD)	
Dry									
Yes	290	16.9	2.5	195	12.5	1.1	195	1.3	0.2
No	39	15.8	2.5	35	12.5	2.0	34	1.3	0.2
Canned									
Yes	58	17.3	2.9	48	12.5	1.0	48	1.3	0.2
No	271	16.6	2.5	182	12.5	1.3	181	1.3	0.2
Home prepared									
Yes	99	17.0	2.5	74	12.4	1.2	73	1.4	0.2
No	230	16.7	2.6	156	12.6	1.3	156	1.3	0.2
Table scraps									
Yes	27	17.8	2.2	18	12.8	1.2	18	1.4	0.2
No	302	16.7	2.6	212	12.5	1.3	211	1.3	0.2
Other									
Yes	61	17.2	2.5	41	13.2	1.9	41	1.3	0.2
No	268	16.7	2.6	189	12.4	1.0	188	1.3	0.2

[a] Weight in lbs and height in inches as of February 1, 2005 or as last reported

Table 31—Daily Diet Compared with Weight and Height in Adult Dogs

Type of Diet	Weight[a]			Height[a]			Weight/Height		
	N	Mean ± (SD)		N	Mean ± (SD)		N	Mean ± (SD)	
Dry									
Yes	185	19.0	3.6	111	13.3	1.2	111	1.4	0.2
No	30	18.6	2.6	22	13.5	1.7	22	1.4	0.2
Canned									
Yes	33	17.6	3.2	21	12.9	1.4	21	1.4	0.2
No	182	19.2	3.5	112	13.4	1.3	112	1.4	0.2
Home prepared									
Yes	61	19.2	3.1	43	13.4	1.4	43	1.4	0.2
No	154	18.9	3.7	90	13.3	1.3	90	1.4	0.2
Table scraps									
Yes	20	20.4	4.2	9	13.9	1.6	9	1.6	0.2
No	195	18.8	3.4	124	13.3	1.3	124	1.4	0.2
Other									
Yes	37	19.1	3.5	27	13.4	1.5	27	1.5	0.2
No	178	18.9	3.5	106	13.3	1.2	106	1.4	0.2

[a] Weight in lbs and height in inches as of February 1, 2005 or as last reported

Section III. Health and Environmental Management

Table 32—Frequency of Vaccination[a]

Type of vaccines	Yearly		Every 2 years		Every 3 years		Sporadic		Puppy only		Never	
	N	%	N	%	N	%	N	%	N	%	N	%
Rabies[b]	92	17.1	25	4.7	360	67.0	34	6.3	4	0.7	22	4.1
Distemper[b]	233	46.0	59	11.6	122	24.1	72	14.2	17	3.4	4	0.8
Parvovirus	246	48.8	49	9.7	119	23.6	70	13.9	17	3.4	3	0.6
Leptospirosis	99	29.6	22	6.6	18	5.4	39	11.7	6	1.8	150	44.9
Parainfluenza	166	41.7	42	10.6	88	22.1	57	14.3	8	2.0	37	9.3
Adenovirus	93	29.2	31	9.7	80	25.1	40	12.5	3	0.9	72	22.6
Lyme disease	61	20.1	5	1.6	7	2.3	10	3.3	0	0.0	221	72.7
Kennel cough	163	41.2	8	2.0	6	1.5	93	23.5	1	0.3	125	31.6
Coronavirus	88	28.0	22	7.0	18	5.7	38	12.1	3	1.0	145	46.2

[a] Numbers may not add to 566 CKCSs because of missing information.
[b] In addition, 19 owners reported distemper and parvovirus revaccination is based on antibody titer.

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Table 33—Frequency of Routine Deworming

	Based on positive fecal tests		Yearly		Every 2 years		Every 3 years		Sporadic		Never[a]	
	N	%	N	%	N	%	N	%	N	%	N	%
Routine deworming[a]	248	45.6	87	16.0	1	0.2	2	0.4	82	15.1	124	22.8

[a] Information on routine deworming not reported for 22 CKCSs.

Table 34—Frequency of Heartworm Prevention

	Monthly Year-round		Monthly Seasonal		ProHeart6 Every 6 months		Never[a]	
	N	%	N	%	N	%	N	%
Heartworm frequency[a]	265	49.3	153	28.4	8	1.5	112	20.8

[a] Heartworm prevention information not reported for 28 CKCSs.

Table 35—State of Residence of CKCSs That Did Not Receive Heartworm Preventative[a]

State of residence	N	%
Washington	25	34.3
California	15	20.6
Nevada	5	6.9
New Jersey	4	5.5
Pennsylvania	4	5.5
Wisconsin	3	4.1
Ohio	2	2.7
Oregon	2	2.7
New York	1	1.4
Vermont	1	1.4
Not reported	11	15.1
Total	73	100.0

[a] US residents only

Table 36—Frequency of Exposure to Flea/Tick Products

Type of flea / tick product	Never[a]		Ever							
			Sporadic		Summer		Monthly		Weekly	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Dips	410	89.7	44	9.6	2	0.4	1	0.2	0	0.0
Drops on skin	131	25.4	141	27.4	136	26.4	107	20.8	0	0.0
Shampoos	330	72.5	102	22.4	15	3.3	7	1.5	1	0.2
Spray/Powder	391	87.3	50	11.2	6	1.3	1	0.2	0	0.0
Natural	351	80.7	74	17.0	7	1.6	0	0.0	3	0.7
Other	295	89.9	8	2.4	7	2.1	15	4.6	3	0.9

[a] Numbers may not add up to 566 CKCSs due to unreported information.

Table 37—Frequency of Water Exposure

	Never[a]		Ever							
			Sporadic		Summer		Monthly		Weekly	
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)
Swimming—pool	401	89.3	29	6.5	18	4.0	1	0.2	0	0.0
Swimming—fresh water	361	80.4	64	14.3	23	5.1	0	0.0	1	0.2
Swimming—salt water	400	88.3	39	8.6	13	2.9	0	0.0	1	0.2

[a] Numbers may not add up to 566 CKCSs due to unreported information .

Table 38—Frequency of Exposure to Lawn Chemicals

	N[a]	%
Frequency of contact with any lawn chemical		
Never	286	57.3
Ever	213	42.7
Sporadic	134	26.9
Summer	71	14.2
Monthly	8	1.6
Weekly	0	0.0
Frequency of chemical application to yard		
Never	306	54.8
Sporadic	106	19.0
Seasonal	119	21.3
Year-round	27	4.8
Amount of time elapsed before dog allowed on yard treated with lawn products		
Lawn product never used	262	52.4
> 24 hours	57	11.4
13 - 24 hours	79	15.8
≤12 hours	102	20.4
Walk dog through chemically treated areas		
Yes	43	7.7
No	514	92.3

[a] Numbers may not add to 566 CKCSs due to missing information

Section IV. Health Related Information

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved

Disorders	N	% of reports in category	% of 566 CKCSs
Malignant neoplasms by type			
Adenocarcinoma	3	13.0	0.5
Lymphoma	3	13.0	0.5
Squamous cell	3	13.0	0.5
Carcinoma, unspecified	2	8.7	0.4
Mast cell	1	4.3	0.2
Sarcoma, unspecified	1	4.3	0.2
Other	2	8.7	0.4
Unknown	8	34.8	1.4
Total incidents	**23**		
Total CKCSs	**23**		**4.1**
Malignant neoplasms by location			
Mammary	6	26.1	1.1
Intestine	2	8.7	0.4
Mouth	2	8.7	0.4
Bladder	1	4.3	0.2
Brain	1	4.3	0.2
Lymph node	1	4.3	0.2
Skin	1	4.3	0.2
Other	8	34.8	1.4
Unknown	1	4.3	0.2
Total incidents	**23**		
Total CKCSs	**23**		**4.1**
Non-malignant neoplasms by type			
Lipoma	15	40.5	2.7
Papilloma	14	37.8	2.5
Other	8	21.6	1.4
Total incidents	**37**		
Total CKCSs	**32**		**5.7**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 2

Disorders	N	% of reports in category	% of 566 CKCSs
Non-malignant neoplasms by location			
Skin	15	40.5	2.7
Limb / digits	4	10.8	0.7
Mammary	3	8.1	0.5
Eye	3	8.1	0.5
Lymph nodes	1	2.7	0.2
Mouth	1	2.7	0.2
Pancreas	1	2.7	0.2
Other	5	13.5	0.9
Unknown	4	10.8	0.7
Total incidents	**37**		**5.7**
Total CKCSs	**32**		
Heart & circulation			
Heart murmur	174	46.5	30.7
Mitral valve disease	153	40.9	27.0
Heart arrhythmia	19	5.1	3.4
Heart failure-unknown cause	11	2.9	1.9
Cardiomyopathy	5	1.3	0.9
Pulmonic stenosis	1	0.3	0.2
Heartworm infection	0	0.0	0.0
Subaortic stenosis	0	0.0	0.0
Other	11	2.9	1.9
Total incidents	**374**		
Total CKCSs	**251**		**44.4**
Allergies			
Allergic dermatitis due to:			
Fleas	32	27.8	5.7
Inhaled allergens	28	24.3	5.0
Food	20	17.4	3.5
Contact	9	7.8	1.6
Other	7	6.1	1.2
Atopic rhinitis	3	2.6	0.5
Eosinophilic granuloma	2	1.7	0.4
Anesthesia allergy	0	0.0	0.0
Drug allergy	7	6.1	1.2
Other	7	6.1	1.2

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 3

Disorders	N	% of reports in category	% of 566 CKCSs
Allergies (Cont'd)			
Total incidents	**115**		
Total CKCSs	**86**		**15.2**
Endocrine			
Hypothyroid	8	50.0	1.4
Pancreatic insufficiency	3	18.8	0.5
Hyperthyroid	1	6.3	0.2
Cushing's (hyperadrenal)	1	6.3	0.2
Addison's (hypoadrenal)	1	6.3	0.2
Diabetes mellitus	0	0.0	0.0
Other	2	12.5	0.4
Total incidents	**16**		
Total CKCSs	**16**		**2.8**
Digestive tract			
Gastritis	16	21.6	2.8
Colitis	15	20.3	2.7
Excessive diarrhea	14	18.9	2.5
Excessive vomiting	4	5.4	0.7
Foreign body	4	5.4	0.7
Malabsorption	3	4.1	0.5
Bloat	1	1.4	0.2
Esophageal disorder	1	1.4	0.2
Excessive flatulence	0	0.0	0.0
Megaesophagus	0	0.0	0.0
Other	16	21.6	2.8
Total incidents	**74**		
Total CKCSs	**61**		**10.8**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 4

Disorders	N	% of reports in category	% of 566 CKCSs
Blood disorders			
Thrombocytopenia	11	73.3	1.9
Autoimmune hemolytic anemia	1	6.7	0.2
Hemophilia	0	0.0	0.0
Chronic anemia	0	0.0	0.0
Mycrothrombocytopenia	0	0.0	0.0
Bone marrow failure	0	0.0	0.0
Other	3	20.0	0.5
Total incidents	**15**		
Total CKCSs	**14**		**2.5**
Urinary tract / renal			
Bladder infection	27	51.9	4.8
Bladder stones	6	11.5	1.1
Urinary incontinence	6	11.5	1.1
Kidney disease	5	9.6	0.9
Kidney failure	5	9.6	0.9
Other	3	5.8	0.5
Total incidents	**52**		
Total CKCSs	**42**		**7.4**
Neurological			
Syringomyelia	22	42.3	3.9
Seizures of unknown origin	17	32.7	3.0
Seizures of known origin	4	7.7	0.7
Wobbler syndrome	1	1.9	0.2
Nerve degeneration	1	1.9	0.2
Tremors (generalized)	1	1.9	0.2
Dementia	0	0.0	0.0
Other	6	11.5	1.1
Total incidents	**52**		
Total CKCSs	**52**		**9.2**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 5

Disorders	N	% of reports in category	% of 566 CKCSs
Musculoskeletal			
Patella luxation	35	28.0	6.2
Hip dysplasia	24	19.2	4.2
Arthritis senior	22	17.6	3.9
Degenerative disk disease	18	14.4	3.2
Anterior cruciate ligament tear	8	6.4	1.4
Spondylosis	3	2.4	0.5
Arthritis autoimmune	3	2.4	0.5
Osteochondritis	1	0.8	0.2
Elbow dysplasia	0	0.0	0.0
Eosinophilic panosteitis	0	0.0	0.0
Other	11	8.8	1.9
Total incidents	**125**		
Total CKCSs	**103**		**18.2**
Eye			
Adult onset cataracts	34	17.4	6.0
Dry eye	30	15.4	5.3
Corneal abrasion	22	11.3	3.9
Retinal folds	17	8.7	3.0
Distichiasis	15	7.7	2.7
Corneal dystrophy	15	7.7	2.7
Injury	12	6.2	2.1
Corneal ulcers	9	4.6	1.6
Prolapsed third eyelid	2	1.0	0.4
Entropion	2	1.0	0.4
PRA	2	1.0	0.4
Juvenile cataracts	1	0.5	0.2
Glaucoma	1	0.5	0.2
Ectropion	0	0.0	0.0
Other	33	16.9	5.8
Total incidents	**195**		
Total CKCSs	**154**		**27.2**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 6

Disorders	N	% of reports in category	% of 566 CKCSs
Ear			
Chronic ear infection	37	35.9	6.5
Hearing problem	35	34.0	6.2
Acute ear infection	30	29.1	5.3
Other	1	1.0	0.2
Total incidents	**103**		
Total CKCSs	**96**		**17.0**
Reproductive (females)			% of 345 bitches
Cesarian	54	41.2	15.7
Difficult whelping	18	13.7	5.2
Pyometra	14	10.7	4.1
Failure to carry to term	12	9.2	3.5
Premature delivery	6	4.6	1.7
Chronic false pregnancy	6	4.6	1.7
Irregular heat cycles	5	3.8	1.4
Infertility	3	2.3	0.9
Mastitis	3	2.3	0.9
Malformed puppies	3	2.3	0.9
Insufficient milk	1	0.8	0.3
Poor mother instinct	0	0.0	0.0
Early sterility	0	0.0	0.0
Other	6	4.6	1.7
Total incidents	**131**		
Total CKCSs	**88**		**25.5**
Reproductive (males)			% of 221 dogs
Low sperm count	6	20.7	2.7
Cryptorchidism unilateral	5	17.2	2.3
Abnormal semen	4	13.8	1.8
Enlarged prostate	4	13.8	1.8
Early sterility	3	10.3	1.4
No natural tie performed	2	6.9	0.9
Cryptorchidism bilateral	2	6.9	0.9
Testicular atrophy	2	6.9	0.9
Prostate infection	1	3.4	0.5
Lack of libido	0	0.0	0.0

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 7

Disorders	N	% of reports in category	% of 566 CKCSs
Reproductive (males)—Cont'd			% of 221 dogs
Other	0	0.0	0.0
Total incidents	**29**		
Total CKCSs	**22**		**10.0**
Skin / coat			
Sebaceous cyst	28	32.6	5.0
Hot spots	27	31.4	4.8
Seborrhea	9	10.5	1.6
Dull, dry skin/coat	6	7.0	1.1
Thin coat	5	5.8	0.9
Excessive coat	4	4.7	0.7
Pyoderma	2	2.3	0.4
Coat color change	1	1.2	0.2
Sebaceous adenititis	1	1.2	0.2
Rough coat	0	0.0	0.0
Pigment abnormalities	0	0.0	0.0
Other	3	3.5	0.5
Total incidents	**86**		
Total CKCSs	**69**		**12.2**
Trauma / accidents			
Lameness requiring treatment	18	38.3	3.2
Laceration requiring stitches	9	19.1	1.6
Fracture	8	17.0	1.4
Other	12	25.5	2.1
Total incidents	**47**		
Total CKCSs	**45**		**8.0**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 8

Disorders	N	% of reports in category	% of 566 CKCSs
Bacterial Infections			
Cystitis	8	20.5	1.4
Lyme disease	8	20.5	1.4
Tonsillitis	7	17.9	1.2
Pueumonia	4	10.3	0.7
Rocky mountain spotted fever	3	7.7	0.5
Ehrlichiosis	2	5.2	0.4
Interdigital infection	2	5.2	0.4
Prostatitis	1	2.6	0.2
Septicemia	0	0.0	0.0
Babesiosis	0	0.0	0.0
Other	4	10.3	0.7
Total incidents	**39**		
Total CKCSs	**36**		**6.4**
Viral Infections			
Tracheobronchitis	11	100.0	1.9
Parvovirus	0	0.0	0.0
Corona virus	0	0.0	0.0
Distemper	0	0.0	0.0
Other	0	0.0	0.0
Total incidents	**11**		
Total CKCSs	**11**		**1.9**
Fungal Infections			
Ringworm	1	25.0	0.2
Other	3	75.0	0.5
Total incidents	**4**		
Total CKCSs	**4**		**0.7**

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 9

Disorders	N	% of reports in category	% of 566 CKCSs
Parasitic Infestations			
Ear mites	35	18.4	6.2
Flea problems	31	16.3	5.5
Giardia	27	14.2	4.8
Coccidia	23	12.1	4.1
Tapeworms	22	11.6	3.9
Cheyletiella mites	16	8.4	2.8
Whipworms	8	4.2	1.4
Sarcoptic mange	8	4.2	1.4
Roundworms	7	3.7	1.2
Hookworms	6	3.2	1.1
Tick problem	3	1.6	0.5
Demodectic mange	0	0.0	0.0
Other	4	2.1	0.7
Total incidents	**190**		
Total CKCSs	**141**		**24.9**
Nose and mouth			
Gingivitis	104	52.8	18.4
Missing teeth	40	20.3	7.1
Undershot	16	8.1	2.8
Level bite	5	2.5	0.9
Overbite	2	1.0	0.4
Other abnormal dentition	8	4.1	1.4
Other	22	11.2	3.9
Total incidents	**197**		
Total CKCSs	**163**		**28.8**
Behavior problems			
Separation anxiety	9	24.3	1.6
Inappropriate urination	6	16.2	1.1
Obsessive / compulsive	4	10.8	0.7
Fear aggression	3	8.1	0.5
Fly catchers syndrome	3	8.1	0.5
Extremely fearful	3	8.1	0.5
Dominance aggression	2	5.4	0.4
Territorial aggression	2	5.4	0.4
Phobias	2	5.4	0.4
Timid or extremely shy	2	5.4	0.4

Table 39—Prevalence of Veterinary-Confirmed Health Disorders by Type and System Involved (Cont'd)—Page 10

Disorders	N	% of reports in category	% of 566 CKCSs
Behavior problems (cont'd)			
Possessive aggression	1	2.7	0.2
Other	0	0.0	0.0
Total incidents	**37**		
Total CKCSs	**24**		**4.2**
Congenital			
Umbilical hernia	71	87.7	12.5
Inguinal hernia	7	8.6	1.2
Diaphragmatic hernia	0	0.0	0.0
Club foot	0	0.0	0.0
Swimmer puppy	0	0.0	0.0
Cleft lip	0	0.0	0.0
Cleft palate	0	0.0	0.0
Other	3	3.7	0.5
Total incidents	**81**		
Total CKCSs	**81**		**14.3**
Other			
Anal sacculitis	66	62.9	11.7
Total incidents	**66**		
Total CKCSs	**66**		**11.7**

Table 40—Mitral Valve Disease (MVD) in 192 CKCSs[a]

	N	%
Signs of MVD "cleared" at a later date		
Yes	11	5.7
No	181	94.3
MVD confirmed by ultrasound/color doppler		
Yes	114	59.4
No	78	40.6
Medications used[b]		
Enalapril	55	28.6
Furosemide	43	22.4
Enacard	17	8.9
Spironolactone	13	6.8
Digoxin	12	6.3
Fortekor	10	5.2
Frudix	5	2.6
Vasotec	4	2.1
Vetmedin	4	2.1
Aminophyllen	3	1.6
Aspirin	3	1.6
Atenolol	3	1.6
Carvedilol	3	1.6
Analypril	2	1.0
Hydralazine	2	1.0
Lotensin	2	1.0
Hawthorn	2	1.0
Furozenol	1	0.5
Zestril	1	0.5
Aldactone	1	0.5
Benzapril	1	0.5
Biocardio	1	0.5
Lanoxin	1	0.5
Tamyl	1	0.5
Theophylline	1	0.5
Aldactone	1	0.5
Coreg	1	0.5
Coruental-D	1	0.5
Isonergine	1	0.5
Potassium	1	0.5
Procainamide	1	0.5
Verzomil	1	0.5

[a] This table is based on those owners who responded to questions regarding "confirmed" MVD. Note, however, that only 153 owners responded 'Yes' to veterinary-confirmed MVD in Table 38.

[b] Mean (SD) age at which medication for MVD was started: 7.7 (2.4) years

Table 41—Hearing Problem in 35 CKCSs

	N	%			
BAER test used?					
Yes	14	40.0			
No	15	42.9			
Not reported	6	17.1			
			Median	Mean	±SD
			Age (years)		
Age hearing became a serious problem			7.0	6.9	2.9
Age CKCS became totally deaf			8.0	7.5	3.1

Table 42—Geographic Distribution of Lyme Disease Cases

State of residence of CKCSs diagnosed with Lyme disease*	N	%
New Jersey	2	25.0
Massachusetts	1	12.5
Maryland	1	12.5
New York	1	12.5
Pennsylvania	1	12.5
Wisconsin	1	12.5
Not reported	1	12.5
Total	8	100.0

* Based on state in which dog spent most of its lifetime

Table 43—Auto Accidents and Hospitalizations

	N[a]	%
Auto accident requiring treatment by a veterinarian		
Yes	4	0.7
No	553	99.3
Hospitalized for health conditions		
Yes	48	8.9
No	491	91.1

[a] Numbers may not add to 566 CKCSs due to unreported information

Table 44—Syringomyelia or Chairi 1 Malformation (SM) in 566 CKCSs

	N	%
CKCS suspected of having SM		
Yes	48	8.5
No	384	67.8
Not reported	134	23.7
CKCS has first degree relative with SM		
Yes	19	3.4
No	228	40.3
Not reported	319	56.4
CKCS diagnosed with SM by a veterinarian		% of 48 CKCSs suspected of having SM
Yes	23	46.9
No	25	53.1

Table 45—Syringomyelia or Chairi 1 Malformation (SM) in 23 CKCSs

	N	%
Age at which CKCS first showed signs of SM (years)		
< 1	4	17.4
1 – 2	5	21.7
3 – 4	6	26.1
4 – 6	5	21.7
7 +	1	4.4
Not reported	2	8.7
Age at which CKCS diagnosed with SM (years)		
< 1	1	4.4
1 – 2	2	8.7
3 – 4	5	21.7
4 – 6	10	43.5
7 +	5	21.7
Diagnosis of SM based on:		
MRI	13	56.5
Post-mortem	0	0.0
Clinical signs only	10	43.5
Surgery performed for SM		
Yes	6	26.1
No	17	73.9
Initial clinical signs of SM		
Shoulder scratching	15	65.2
Scratching elsewhere	4	17.4
Neck pain	13	56.5
Pain elsewhere	5	21.7
Screaming when scratching	2	8.7
Screaming when excited	2	8.7
Screaming when touched	6	26.1
Screaming when change of head position	2	8.7
Screaming when jumping	1	4.4
Screaming for no apparent reason	9	39.1
Scoliosis (twisted spine especially neck)	3	13.0
Wobbly hind limb gait	5	21.7
Weak forelimbs	4	17.4

Table 45—Syringomyelia or Chairi 1 Malformation (SM) in 23 CKCSs (Cont'd)—Page 2

	N	%
Current clinical signs of SM[a]		
Shoulder scratching	15	65.2
Scratching elsewhere	8	34.8
Neck pain	10	43.5
Pain elsewhere	3	13.0
Screaming when scratching	2	8.7
Screaming when excited	3	13.0
Screaming when touched	6	26.1
Screaming when change of head position	2	8.7
Screaming when jumping	4	17.4
Screaming for no apparent reason	4	17.4
Scoliosis (twisted spine especially neck)	3	13.0
Wobbly hind limb gait	6	26.1
Weak forelimbs	6	26.1
Appears normal	4	17.4

[a] One CKCS was euthanized due to syringomyelia

Table 46—Suspected Adverse Reactions

	N	%
Vaccine or drug reaction		
Yes[a, b]	35	6.2
No	520	91.9
Not reported	11	1.9
Age at reaction		% of 35 CKCSs with adverse reactions
0 – 3.9	18	51.4
4 – 7.9	9	25.7
8+	4	11.4
Not reported	4	11.4
Specific vaccines and drugs		
Vaccines	12	34.3
Leptospirosis	5	14.3
Kennel cough	2	5.7
Lyme disease	1	2.9
DHLPP	1	2.9
Rabies	1	2.9
Nobivac	1	2.9
Parvo, distemper	1	2.9
Antibiotics	6	17.1
Baytril	2	5.7
Keflex	2	5.7
Amikacin	1	2.9
Sulfa drugs	1	2.9
Anesthesia	1	2.9
Unspecified	1	2.9
Narcotics	2	5.7
Fentanyl	2	2.9
Heartworm preventatives	2	5.7
Interceptor	1	2.9
Unspecified	1	2.9

Table 46—Suspected Adverse Reactions (cont'd)—Page 2

	N	%
Specific vaccines and drugs		
Flea/tick products	4	11.4
Biospot	2	5.7
Frontline	1	2.9
Unspecified	1	2.9
NSAIDs	2	5.7
Aspirin	1	2.9
Bextra	1	2.9
Other	4	11.4
Ivermectin	1	2.9
Atropine	1	2.9
Pimobendan	1	2.9
Theophylline	1	2.9

[a] Includes 12 vaccine-, 1 anesthetic- and 20 drug-reactions
[b] 19 (54.3 %) veterinary-confirmed

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N[a]	Mean	± (SD)	Minimum	Maximum
Malignant neoplasms					
Adenocarcinoma	3	10.0	2.6	7.0	12.0
Lymphoma	3	8.8	1.3	7.5	10.0
Squamous cell	3	9.7	2.5	7.0	12.0
Non-malignant neoplasms					
Lipoma	15	6.4	2.5	0.7	10.0
Papilloma	12	8.1	2.5	3.0	12.0
Heart & circulation					
Murmurs	169	6.0	2.4	0	15.0
Mitral valve disease	148	6.2	2.3	0.7	11.6
Heart arrhythmia	19	5.4	2.8	0.5	12.0
Heart failure-unknown cause	10	8.9	3.0	5.0	14.0
Cardiomyopathy	5	7.6	3.4	2.0	10.0
Allergies					
Allergic dermatitis due to:					
Fleas	31	2.9	2.4	0.5	10.0
Inhaled allergens	27	2.7	1.9	0.5	10.0
Food	20	2.3	2.3	0.2	10.0
Contact	9	2.7	2.0	0.2	5.0
Other	7	3.7	2.1	2.0	8.0
Drug Allergy	7	3.5	3.5	1.0	10.5
Atopic rhinitis	3	2.2	1.3	0.7	3.0
Endocrine					
Hypothyroid	8	6.6	2.8	3.0	12.0
Pancreatic insufficiency	3	4.3	3.2	2.0	8.0

[a] May not agree with confirmed reports in Table 38 because age at first occurrence was not reported for all cases.

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)— (Cont'd)-Page 2

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N	Mean	± (SD)	Minimum	Maximum
Gastrointestinal					
Gastritis	15	4.1	4.0	0.4	13.0
Colitis	13	2.6	2.1	0.7	8.0
Excessive diarrhea	14	4.0	3.2	0.6	12.0
Excessive vomiting	4	3.0	2.9	0.4	6.0
Foreign body	4	5.3	4.6	1.5	12.0
Malabsorption	3	5.7	3.2	2.0	8.0
Blood disorders					
Thrombocytopenia	8	3.7	3.3	0.9	10.0
Urinary tract / renal					
Bladder infection	26	5.2	3.7	0.3	13.0
Bladder stones	6	6.8	4.2	2.0	12.5
Urinary incontinence	6	6.2	3.4	1.0	10.0
Kidney disease	5	9.0	4.5	2.0	13.0
Kidney failure	5	12.1	2.4	8.0	14.0
Neurological					
Syringomyelia	22	4.1	2.5	0.8	11.0
Seizures--unknown origin	16	6.3	4.1	0.8	12.7
Seizures—known origin	4	5.8	5.9	0.5	13.0
Musculoskeletal					
Patella luxation	35	2.4	1.6	0.5	7.0
Hip dysplasia	22	2.9	2.6	0.1	12.0
Arthritis senior	22	8.9	2.3	5.5	13.0
Degenerative disk disease	17	5.4	2.3	2.0	11.0
Anterior cruciate ligament tear	8	6.7	4.9	0.5	13.0
Spondylosis	2	5.0	1.4	4.0	6.0
Arthritis autoimmune	3	7.0	4.6	3.0	12.0

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)— (Cont'd)-Page 3

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N	Mean	± (SD)	Minimum	Maximum
Eye					
Adult onset cataracts	33	9.2	2.9	2.0	13.0
Dry eye	29	7.7	3.0	2.5	13.0
Corneal abrasion	20	4.5	3.1	0.5	10.0
Retinal folds	16	1.0	1.0	0	4.0
Distichiasis	14	3.0	2.3	0.5	7.0
Corneal dystrophy	15	2.9	1.2	1.0	6.0
Injury	12	4.8	3.3	0.5	10.0
Corneal ulcers	8	5.1	2.2	2.0	8.0
Ear					
Chronic ear infection	36	3.1	2.5	0.2	11.0
Hearing problem	34	5.9	3.1	1.5	12.0
Acute ear infection	28	3.9	2.4	0.2	11.0
Reproductive (female)					
Cesarian	52	3.8	1.3	1.0	6.0
Difficult whelping	18	3.6	0.9	2.0	5.1
Pyometra	13	5.3	2.3	2.0	8.0
Failure to carry to term	12	4.0	1.4	1.0	6.0
Premature delivery	6	3.4	1.5	2.0	6.0
Chronic false pregnancy	6	1.9	2.1	0.5	6.0
Irregular heat cycles	5	1.9	1.1	0.5	3.0
Infertility	3	3.0	1.7	2.0	5.0
Mastitis	3	5.0	1.0	4.0	6.0
Malformed puppies	3	2.0	1.0	1.0	3.0

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)--(Cont'd)-Page 4

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N	Mean ± (SD)		Minimum	Maximum
Reproductive (male)					
Low sperm count	6	4.5	2.1	2.0	8.0
Cryptorchidism unilateral	5	0.1	0.2	0	0.5
Abnormal semen	4	3.8	1.5	2.0	5.0
Enlarged prostate	4	5.8	3.0	3.0	10.0
Early sterility	3	2.7	1.2	2.0	4.0
Skin / coat					
Sebaceous cysts	26	6.0	3.1	1.5	12.0
Hot spots	27	2.8	1.5	1.0	7.2
Seborrhea	8	3.6	3.2	1.0	10.0
Dull, dry skin/coat	5	4.0	2.9	0.5	7.0
Thin coat	4	3.1	2.7	1.0	7.0
Excessive coat	4	3.0	1.8	1.0	5.0
Trauma / accidents					
Lameness requiring treatment	18	4.4	3.1	0.8	12.0
Laceration requiring stitches	8	3.1	2.0	1.0	7.0
Fracture	8	3.4	4.3	0.1	11.0
Bacterial infections					
Cystitis	8	7.4	3.8	2.0	13.0
Lyme disease	8	4.8	1.7	3.0	8.0
Tonsillitis	7	1.5	1.2	0.5	4.0
Pneumonia	4	6.3	5.4	2.0	14.0
RMSF	2	4.5	0.7	4.0	5.0

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)--(Cont'd)-Page 5

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N	Mean ± (SD)		Minimum	Maximum
Viral infections					
Tracheobronchitis	11	4.1	3.4	0.1	9.0
Parasitic					
Ear mites	34	4.4	2.9	0.3	12.0
Flea problems	31	2.7	2.5	0.3	11.2
Giardia	27	2.5	2.0	0.1	7.0
Coccidia	22	2.4	2.7	0.2	10.0
Tapeworms	20	3.7	2.2	0.1	7.8
Cheyletiella mites	16	3.0	3.3	0.1	13.0
Whipworms	8	2.7	1.9	0.1	5.5
Sarcoptic mange	8	1.7	2.4	0.1	7.0
Roundworms	6	0.6	1.2	0	3.0
Hookworms	6	3.0	2.3	0.1	5.5
Tick problem	3	4.7	2.1	3.0	7.0
Nose & mouth					
Gingivitis	102	5.0	2.1	0.5	10.0
Missing teeth	39	4.7	2.7	0	13.0
Undershot	16	0.3	0.4	0	1.0
Level bite	5	0.3	0.2	0	0.5
Behavior problems					
Separation anxiety	9	2.5	2.4	0.3	8.0
Inappropriate urination	6	5.7	5.6	0.2	14.0
Obsessive / compulsive	4	1.5	1.3	0	3.0
Fear aggression	3	2.0	1.0	1.0	3.0
Fly catchers syndrome	3	1.2	1.0	0	2.0
Extremely fearful	3	2.7	1.2	2.0	4.0

Table 47—Mean Age at First Occurrence of Health Disorders (3 or More Cases)--(Cont'd)-Page 6

Health disorder	Affected CKCSs	Age at first occurrence, years			
	N	Mean	± (SD)	Minimum	Maximum
Congenital					
Umbilical hernia	66	0.1	0.2	0	1.0
Inguinal hernia	7	1.0	1.8	0	5.0
Other					
Anal sacculitis	64	3.7	2.5	0.5	14.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N[a]	%
Malignant neoplasm										
Adenocarcinoma	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0
Lymphoma	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0
Squamous cell	0	0.0	0	0.0	1	33.3	2	66.7	3	100.0
Non-malignant neoplasm										
Lipoma	3	20.0	5	33.3	4	26.7	3	20	15	100.0
Papiloma	1	8.3	2	16.7	3	25.0	6	50.0	12	100.0
Cardiovascular										
Heart murmur	44	26.0	58	34.3	46	27.2	21	12.4	169	100.0
Mitral valve disease	36	24.3	51	34.5	36	24.3	25	16.9	148	100.0
Heart arrythmia	8	42.1	7	36.8	2	10.5	2	10.5	19	100.0
Heart failure	0	0.0	2	20.0	3	30.0	5	50.0	10	100.0
Cardiomyopathy	1	20.0	0	0.0	1	20.0	3	60.0	5	100.0

[a] May not agree with confirmed reports in Table 46 because age at first occurrence was not reported for all cases

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 2

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Allergies										
Allergic dermatitits due to:										
Fleas	24	77.4	4	12.9	2	6.5	1	3.2	31	100.0
Inhaled allergens	23	85.2	3	11.1	0	0.0	1	3.7	27	100.0
Food	17	85.0	2	10.0	0	0.0	1	5.0	20	100.0
Contact	6	66.7	3	33.3	0	0.0	0	0.0	9	100.0
Other	6	85.7	0	0.0	1	14.3	0	0.0	7	100.0
Atopic rhinitis	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0
Drug allergy	5	71.4	1	14.3	0	0.0	1	14.3	7	100.0
Endocrine										
Hypothyroid	2	25.0	3	37.5	2	25.0	1	12.5	8	100.0
Pancreatic insufficiency	2	66.7	0	0.0	1	33.3	0	0.0	3	100.0
Gastrointestinal										
Gastritis	8	53.3	5	33.3	0	0.0	2	13.3	15	100.0
Colitis	11	84.6	1	7.7	1	7.7	0	0.0	13	100.0
Excessive diarrhea	9	64.3	2	14.3	2	14.3	1	7.1	14	100.0
Excessive vomiting	2	50.0	2	50.0	0	0.0	0	0.0	4	100.0
Foreign body	3	75.0	0	0.0	0	0.0	1	25.0	4	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 3

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Gastrointestinal (cont'd)										
Malabsorption	1	33.3	0	0.0	2	66.7	0	0.0	3	100.0
Blood disorders										100.0
Thrombocytopenia	6	75.0	0	0.0	1	12.5	1	12.5	8	100.0
Urinary tract										
Bladder infections	13	50.0	5	19.2	3	11.5	5	19.2	26	100.0
Bladder stones	2	33.3	2	33.3	0	0.0	2	33.3	6	100.0
Urinary incontinence	2	33.3	0	0.0	3	50.0	1	16.7	6	100.0
Kidney disease	1	20.0	0	0.0	1	20.0	3	60.0	5	100.0
Kidney failure	0	0.0	0	0.0	1	20.0	4	80.0	5	100.0
Neurological										
Syringomyelia	14	63.6	5	22.7	2	9.1	1	4.5	22	100.0
Seizures of known origin	2	50.0	0	0.0	1	25.0	1	25.0	4	100.0
Seizures of unknown origin	7	43.8	2	12.5	1	6.3	6	37.5	16	100.0
Musculoskeletal										
Patella luxation	30	85.7	4	11.4	1	2.9	0	0.0	35	100.0
Hip dysplasia	19	86.4	1	4.5	1	4.5	1	4.5	22	100.0
Arthritis senior	0	0.0	4	18.2	8	36.4	10	45.5	22	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 4

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Musculoskeletal (cont'd)										
Degenerative disk disease	6	35.3	7	41.2	3	17.6	1	5.9	17	100.0
Anterior cruciate ligament tear	4	50.0	0	0.0	1	12.5	3	37.5	8	100.0
Spondylosis	1	50.0	1	50.0	0	0.0	0	0.0	2	100.0
Arthritis autoimmune	1	33.3	1	33.3	0	0.0	1	33.3	3	100.0
Eye										
Adult onset cataracts	3	9.1	4	12.1	3	9.1	23	69.7	33	100.0
Dry eye	5	17.2	8	27.6	4	13.8	12	41.4	29	100.0
Corneal abrasion	11	55.0	3	15.0	4	20.0	2	10.0	20	100.0
Retinal folds	16	100.0	0	0.0	0	0.0	0	0.0	16	100.0
Distichiasis	11	78.6	1	7.1	2	14.3	0	0.0	14	100.0
Corneal dystrophy	14	93.3	1	6.6	0	0.0	0	0.0	15	100.0
Injury	6	50.0	3	25.0	0	0.0	3	25.0	12	100.0
Corneal ulcers	4	50.0	1	12.5	3	37.5	0	0.0	8	100.0
Ear										
Chronic ear infection	28	77.8	4	11.1	2	5.6	2	5.6	36	100.0
Hearing problem	15	44.1	6	17.6	7	20.6	6	17.6	34	100.0
Acute ear infection	18	64.3	7	25.0	2	7.1	1	3.6	28	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 5

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Reproductive—female										
Cesarian	36	69.2	16	30.8	0	0.0	0	0.0	52	100.0
Difficult whelping	15	83.3	3	16.7	0	0.0	0	0.0	18	100.0
Pyometra	5	38.5	3	23.1	5	38.5	0	0.0	13	100.0
Failure to carry to term	8	66.7	4	33.3	0	0.0	0	0.0	12	100.0
Premature delivery	5	83.3	1	16.7	0	0.0	0	0.0	6	100.0
Chronic false pregnancy	5	83.3	1	16.7	0	0.0	0	0.0	6	100.0
Irregular heat cycles	5	100.0	0	0.0	0	0.0	0	0.0	5	100.0
Infertility	2	66.7	1	33.3	0	0.0	0	0.0	3	100.0
Mastitis	1	33.3	2	67.7	0	0.0	0	0.0	3	100.0
Malformed puppies	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0
Reproductive—male										
Low sperm count	3	50.0	2	33.3	1	16.7	0	0.0	6	100.0
Cryptorchidism unilateral	5	100.0	0	0.0	0	0.0	0	0.0	5	100.0
Abnormal semen	2	50.0	2	50.0	0	0.0	0	0.0	4	100.0
Enlarged prostate	1	25.0	2	50.0	0	0.0	1	25.0	4	100.0
Early sterility	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 6

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Skin/coat										
Sebaceous cyst	9	34.6	6	23.1	4	15.4	7	26.9	26	100.0
Hot spots	23	85.2	3	11.1	1	3.7	0	0.0	27	100.0
Seborrhea	6	75.0	0	0.0	1	12.5	1	12.5	8	100.0
Dull, dry skin/coat	3	60.0	0	0.0	2	40.0	0	0.0	5	100.0
Thin coat	3	75.0	0	0.0	1	25.0	0	0.0	4	100.0
Excessive coat	3	75.0	1	25.0	0	0.0	0	0.0	4	100.0
Trauma/Accidents										
Lameness requiring treatment	12	66.7	2	11.1	2	11.1	2	11.1	18	100.0
Laceration requiring stitches	6	75.0	1	12.5	1	12.5	0	0.0	8	100.0
Fracture	6	75.0	0	0.0	0	0.0	2	25.0	8	100.0
Bacterial										
Cystitis	1	12.5	3	37.5	1	12.5	3	37.5	8	100.0
Lyme disease	4	50.0	3	37.5	1	12.5	0	0.0	8	100.0
Tonsillitis	7	100.0	0	0.0	0	0.0	0	0.0	7	100.0
Pneumonia	2	50.0	1	25.0	0	0.0	1	25.0	4	100.0
RMSF	1	50.0	1	50.0	0	0.0	0	0.0	2	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 7

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Viral										
Tracheobronchitis (kennel cough)	6	54.5	2	18.2	1	9.1	2	18.2	11	100.0
Parasitic										
Ear mites	17	50.0	10	29.4	5	14.7	2	5.9	34	100.0
Flea problems	28	90.3	0	0.0	1	3.2	2	6.5	31	100.0
Giardia	22	81.5	3	11.1	2	7.4	0	0.0	27	100.0
Coccidia	19	86.4	1	4.5	1	4.5	1	4.5	22	100.0
Tapeworms	14	70.0	4	20.0	2	10.0	0	0.0	20	100.0
Cheyletiella mites	12	75.0	3	18.8	0	0.0	1	6.3	16	100.0
Whipworms	7	87.5	1	12.5	0	0.0	0	0.0	8	100.0
Sarcoptic mange	7	87.5	0	0.0	1	12.5	0	0.0	8	100.0
Roundworms	6	100.0	0	0.0	0	0.0	0	0.0	6	100.0
Hookworms	4	66.7	2	33.3	0	0.0	0	0.0	6	100.0
Tick problem	2	66.7	0	0.0	1	33.3	0	0.0	3	100.0
Nose and mouth										
Gingivitis	40	39.2	35	34.3	24	23.5	3	2.9	102	100.0
Missing teeth	19	48.7	12	30.8	5	12.8	3	7.7	39	100.0
Undershot	16	100.0	0	0.0	0	0.0	0	0.0	16	100.0

Table 48—First Occurrence of Health Disorders (3 or More Cases) by Age Group--(Cont'd)—Page 8

Health Disorders	Age in years									
	0 – 4.9		5 – 6.9		7 – 8.9		9+		All ages	
	N	%	N	%	N	%	N	%	N	%
Nose and mouth (cont'd)										
Level bite	5	100.0	0	0.0	0	0.0	0	0.0	5	100.0
Behavior										
Separation anxiety	8	88.9	0	0.0	1	11.1	0	0.0	9	100.0
Inappropriate urination	3	50.0	0	0.0	1	16.7	2	33.3	6	100.0
Obsessive / compulsive	4	100.0	0	0.0	0	0.0	0	0.0	4	100.0
Fear aggression	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0
Fly catchers syndrome	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0
Extremely fearful	3	100.0	0	0.0	0	0.0	0	0.0	3	100.0
Congenital										
Umbilical hernia	66	100.0	0	0.0	0	0.0	0	0.0	66	100.0
Inguinal hernia	6	85.7	1	14.3	0	0.0	0	0.0	7	100.0
Other										
Anal sacculitis	43	67.2	15	23.4	4	6.3	2	3.1	64	100.0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years)

Disorder	Age in Years			
	0 – 4.9	5 – 6.9	7 – 8.9	9+
Neoplasia by type	**0.7**	**4.0**	**12.8**	**24.4**
Adenocarcinoma	0	0	2.1	4.1
Dogs	0	0	0	4.3
Bitches	0	0	3.7	3.7
Fibrosarcoma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Hemangiosarcoma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Lymphoma	0	0	2.1	4.1
Dogs	0	0	5.1	4.3
Bitches	0	0	0	3.7
Malignant Giant Cell	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Mast Cell	0	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0	0	0	0
Melanoma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Mesothelioma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Myeloma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Osteosarcoma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Sertoli cell tumor	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Squamous cell	0	0	2.1	4.1
Dogs	0	0	0	4.3
Bitches	0	0	3.7	3.7
Transitional cell carcinoma	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 2

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Carcinoma, unspecified	0	0	2.1	2.0
Dogs	0	0	0	4.3
Bitches	0	0	3.7	0
Sarcoma, unspecified	0	1.3	0	0
Dogs	0	3.2	0	0
Bitches	0	0	0	0
Other neoplasms	0.4	1.3	0	0
Dogs	0	3.2	0	0
Bitches	0.6	0	0	0
Unknown neoplasms	0.4	1.3	4.3	8.1
Dogs	0	3.2	0	4.3
Bitches	0.6	0	7.3	11.2
Non-Malignant Neoplasms	**2.6**	**10.6**	**17.1**	**24.4**
Lipoma	1.1	6.6	8.5	6.1
Dogs	0.9	6.5	10.3	8.6
Bitches	1.2	6.7	7.3	3.7
Papilloma	0.4	2.6	6.4	12.2
Dogs	0	6.5	10.3	12.8
Bitches	0.6	0	3.7	11.2
Other non-malignant neoplasms	1.1	1.3	2.1	6.1
Dogs	0.9	0	0	8.6
Bitches	1.2	2.2	3.7	3.7
Cardiovascular	**35.4**	**157.1**	**190.1**	**118.1**
Heart Failure (unknown cause)	0	2.6	6.4	10.2
Dogs	0	3.2	10.3	4.3
Bitches	0	2.2	3.7	14.9
Cardiomyopathy	0.4	0	2.1	6.1
Dogs	0	0	5.1	4.3
Bitches	0.6	0	0	7.5
Heartworm infection	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Heart arrhythmia	2.9	9.2	4.3	4.1
Dogs	3.7	6.5	0	8.6
Bitches	2.4	11.1	7.3	0
Heart murmur	16.1	76.6	98.2	42.7
Dogs	17.7	81.0	112.9	34.2
Bitches	15.0	73.5	87.8	48.6

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 3

Disorder	Age in Years			
	0 – 4.9	5 – 6.9	7 – 8.9	9+
Pulmonic stenosis	0	1.3	0	0
Dogs	0	0	0	0
Bitches	0	2.2	0	0
Subaortic stenosis	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Mitral valve disease	13.1	67.3	76.9	50.9
Dogs	11.2	71.3	92.4	42.8
Bitches	14.4	64.6	65.8	56.0
Other cardiovascular disorders	2.9	0	2.1	4.1
Dogs	0.9	0	0	4.3
Bitches	4.2	0	3.7	3.7
Allergy	**33.2**	**18.5**	**6.4**	**10.2**
Allergic dermatitis due to:				
Fleas	8.8	5.3	4.3	2.0
Dogs	13.1	9.7	5.1	4.3
Bitches	6.0	2.2	3.7	0
Food	6.2	2.6	0	2.0
Dogs	6.5	3.2	0	4.3
Bitches	6.0	2.2	0	0
Inhaled allergens	8.4	4.0	0	2.0
Dogs	11.2	3.2	0	4.3
Bitches	6.6	4.5	0	0
Contact	2.2	4.0	0	0
Dogs	3.7	3.2	0	0
Bitches	1.2	4.5	0	0
Other allergic dermatitis	2.2	0	2.1	0
Dogs	4.7	0	0	0
Bitches	0.6	0	3.7	0
Atopic rhinitis	1.1	0	0	0
Dogs	1.9	0	0	0
Bitches	0.6	0	0	0
Anesthesia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Eosinophilic granuloma	0.4	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0.6	0	0	0
Drug allergy	1.8	1.3	0	2.0
Dogs	1.9	0	0	4.3
Bitches	1.8	2.2	0	0
Other allergy	2.2	1.3	0	0
Dogs	0.9	3.2	0	0
Bitches	3.0	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 4

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Endocrine	**1.8**	**6.6**	**8.5**	**4.1**
Hypothyroid	0.7	4.0	4.3	2.0
Dogs	0.9	3.2	10.3	4.3
Bitches	0.6	4.5	0	0
Hyperthyroid	0	1.3	0	0
Dogs	0	0	0	0
Bitches	0	2.2	0	0
Cushing's (hyperadrenal)	0	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0	0	0	0
Addison's (hypoadrenal)	0	0	2.1	0
Dogs	0	0	0	0
Bitches	0	0	3.7	0
Diabetes mellitus	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Pancreatic insufficiency	0.7	0	2.1	0
Dogs	0.9	0	0	0
Bitches	0.6	0	3.7	0
Other endocrine disorders	0.4	1.3	0	0
Dogs	0	3.2	0	0
Bitches	0.6	0	0	0
Gastrointestinal	**16.4**	**14.5**	**19.2**	**12.2**
Bloat	0.4	0	0	0
Dogs	0.9	0	0	0
Bitches	0	0	0	0
Mega esophageal disorder	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Esophageal disorder-other	0.4	0	0	0
Dogs	0	0	0	0
Bitches	0.6	0	0	0
Gastritis (chronic or intermittent)	2.9	6.6	0	4.1
Dogs	2.8	3.2	0	8.6
Bitches	3.0	8.9	0	0
Excessive vomiting	0.7	2.6	0	0
Dogs	0.9	6.5	0	0
Bitches	0.6	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 5

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Excessive diarrhea	3.3	2.6	4.3	2.0
Dogs	2.8	6.5	5.1	4.3
Bitches	3.6	0	3.7	0
Excessive flatulence	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Malabsorbtion	0.4	0	4.3	0
Dogs	0	0	10.3	0
Bitches	0.6	0	0	0
Colitis	4.0	1.3	2.1	0
Dogs	6.5	0	0	0
Bitches	2.4	2.2	3.7	0
Foreign body	1.1	0	0	2.0
Dogs	1.9	0	0	0
Bitches	0.6	0	0	3.7
Other gastrointestinal disorders	3.3	1.3	8.5	4.1
Dogs	3.7	0	10.3	0
Bitches	3.0	2.2	7.3	7.5
Hematologic	**2.6**	**0.0**	**6.4**	**2.0**
Hemophilia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Autoimmune hemolytic anemia	0		2.1	0
Dogs	0	0	0	0
Bitches	0	0	3.7	0
Chronic anemia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Mycrothrombycytopenia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Thrombocytopenia	2.2	0	2.1	2.0
Dogs	3.7	0	5.1	0
Female	1.2	0	0	3.7
Bone marrow failure	0	0	0	0
Dogs	0	0	0	0
Female	0	0	0	0
Other hematologic disorders	0.4	0	2.1	0
Dogs	0	0	5.1	0
Bitches	0.6	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 6

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Urinary Tract / Renal	**6.9**	**11.9**	**17.1**	**30.5**
Kidney disease	0.4	0	2.1	6.1
Dogs	0.9	0	0	8.6
Bitches	0	0	3.7	3.7
Kidney failure	0	0	2.1	8.1
Dogs	0	0	0	12.8
Bitches	0	0	3.7	3.7
Bladder stones	0.7	2.6	0	4.1
Dogs	0.9	3.2	0	8.6
Bitches	0.6	2.2	0	0
Bladder infection(s)	4.7	6.6	6.4	10.2
Dogs	3.7	0	0	4.3
Bitches	5.4	11.1	11.0	14.9
Urinary incontinence	0.7	0	6.4	2.0
Dogs	0	0	0	0
Bitches	1.2	0	11.0	3.7
Other urinary tract/renal disorders	0.4	2.6	0	0
Dogs	0	0	0	0
Bitches	0.6	4.5	0	0
Neurological	**8.8**	**9.2**	**10.7**	**30.5**
Seizures of unknown origin	2.6	2.6	2.1	12.2
Dogs	1.9	3.2	0	12.8
Bitches	3.0	2.2	3.7	11.2
Seizures of known origin	0.7	0	2.1	2.0
Dogs	0.9	0	0	4.3
Bitches	0.6	0	3.7	0
Wobbler syndrome	0.4	0	0	0
Dogs	0	0	0	0
Bitches	0.6	0	0	0
Dementia (senility)	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Nerve degeneration	0	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0	0	0	0
Tremors - generalized	0	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0	0	0	0
Syringomyelia	5.1	6.6	4.3	2.1
Dogs	6.5	3.2	0.0	4.3
Bitches	4.2	8.9	7.3	0.0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 7

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Other neurological disorders	0	0	2.1	10.2
Dogs	0	0	5.1	4.3
Bitches	0	0	0	14.9
Musculoskeletal	**24.1**	**26.4**	**36.3**	**34.6**
Eosinophilic panosteitis	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Osteochondritis dissecans	0	0	2.1	0
Dogs	0	0	5.1	0
Bitches	0	0	0	0
Hip dysplasia	6.9	1.3	2.1	2.0
Dogs	7.5	0	0	0
Bitches	6.6	2.2	3.7	3.7
Elbow dysplasia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Spondylosis	0.4	1.3	0	0
Dogs	0	3.2	0	0
Bitches	0.6	0	0	0
Degenerative disk disease	2.2	9.2	6.4	2.0
Dogs	1.9	16.2	15.4	0
Bitches	2.4	4.5	0	3.7
Anterior cruciate ligament tear	1.5	0	2.1	6.1
Dogs	0.9	0	5.1	4.3
Bitches	1.8	0	0	7.5
Arthritis (autoimmune)	0.4	1.3	0	2.0
Dogs	0	3.2	0	4.3
Bitches	0.6	0	0	0
Arthritis (Seniors)	0	5.3	17.1	20.4
Dogs	0	3.2	25.7	21.4
Bitches	0	6.7	11.0	18.7
Patella luxation	11.0	5.3	2.1	0
Dogs	8.4	3.2	5.1	0
Bitches	12.6	6.7	0	0
Other musculoskeletal disorders	1.8	2.6	4.3	2.0
Dogs	4.7	3.2	10.3	0
Bitches	0	2.2	0	3.7

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 8

Disorder	Age in Years			
	0 – 4.9	5 – 6.9	7 – 8.9	9+
Eyes	**35.8**	**35.7**	**40.6**	**87.5**
Progressive retinal atrophy	0	2.6	0	0
Dogs	0	3.2	0	0
Bitches	0	2.2	0	0
Retinal folds	5.8	0	0	0
Dogs	6.5	0	0	0
Bitches	5.4	0	0	0
Juvenile cataracts-early onset	0.4	0	0	0
Dogs	0.9	0	0	0
Bitches	0	0	0	0
Cataracts-adult onset	1.1	5.3	6.4	46.8
Dogs	0	3.2	5.1	51.4
Bitches	1.8	6.7	7.3	41.1
Glaucoma	0	0	0	2.0
Dogs	0	0	0	4.3
Bitches	0	0	0	0
Entropion	0.7	0	0	0
Dogs	0	0	0	0
Bitches	1.2	0	0	0
Ectropion	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Prolapsed 3rd eyelid	0.4	1.3	0	0
Dogs	0	3.2	0	0
Bitches	0.6	0	0	0
Distichiasis	4.0	1.3	4.3	0
Dogs	3.7	0	5.1	0
Bitches	4.2	2.2	3.7	0
Corneal abrasion	4.0	4.0	8.5	4.1
Dogs	2.8	6.5	10.3	0
Bitches	4.8	2.2	7.3	7.5
Corneal ulcers	1.5	1.3	6.4	0
Dogs	1.9	3.2	0	0
Bitches	1.2	0	11.0	0
Dry eye	1.8	10.6	8.5	24.4
Dogs	3.7	13.0	15.4	34.2
Bitches	0.6	8.9	3.7	14.9
Injury	2.2	4.0	0	6.1
Dogs	1.9	6.5	0	8.6
Bitches	2.4	2.2	0	3.7
Corneal Dystrophy	5.1	1.3	0	0
Dogs	5.6	0	0	0
Bitches	4.8	2.2	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 9

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Other eye diseases	8.8	4.0	6.4	4.1
Dogs	7.5	9.7	5.1	4.3
Bitches	9.6	0	7.3	3.7
Ears	**22.3**	**22.4**	**25.6**	**18.3**
Hearing problem first noticed	5.5	7.9	14.9	12.2
Dogs	3.7	16.2	25.7	12.8
Bitches	6.6	2.2	7.3	11.2
Chronic ear infection	10.2	5.3	4.3	4.1
Dogs	14.0	6.5	0	8.6
Bitches	7.8	4.5	7.3	0
Acute ear infection	6.6	9.2	4.3	2.0
Dogs	12.1	6.5	5.1	4.3
Bitches	3.0	11.1	3.7	0
Other ear disorders	0	0	2.1	0
Dogs	0	0	0	0
Bitches	0	0	3.7	0
Reproductive (Bitches)	**53.4**	**75.8**	**18.3**	**0.0**
Infertility	1.2	2.2	0	0
Failure to carry to term	4.8	8.9	0	0
Early sterility (before 5 years of age)	0	0	0	0
Premature delivery(s)	3.0	2.2	0	0
Caesarian delivery	21.6	35.7	0	0
Irregular heat cycles	3.0	0	0	0
Chronic false pregnancy	3.0	2.2	0	0
Difficulty whelping (dystocia)	9.0	6.7	0	0
Mastitis	0.6	4.5	0	0
Pyometra	3.0	6.7	18.3	0
Insufficient milk	0	2.2	0	0
Malformed puppies	1.8	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 10

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Poor mothering instinct	0	0	0	0
Other reproductive disorders	2.4	4.5	0	0
Reproductive (Dogs)	**17.7**	**19.4**	**5.1**	**8.9**
Early sterility (before 8 years of age)	2.8	0	0	0
Low sperm count	2.8	6.5	5.1	0
Abnormal semen	1.9	6.5	0	0
Can't perform natural tie	0.9	0	0	4.5
Cryptorchidism unilateral	4.7	0	0	0
Cryptorchidism bilateral	1.9	0	0	0
Prostate infection(s)	0.9	0	0	0
Enlarged prostate	0.9	6.5	0	4.5
Lack of libido	0	0	0	0
Testicular atrophy	0.9	0	0	0
Other reproductive disorders	0	0	0	0
Skin / Coat	**19.0**	**14.5**	**19.2**	**18.3**
Pyoderma	0.7	0	0	0
Dogs	0.9	0	0	0
Bitches	0.6	0	0	0
Dull and Dry	1.1	0	4.3	0
Dogs	1.9	0	5.1	0
Bitches	0.6	0	3.7	0
Rough coat 'syndrome'	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Seborrhea	2.2	0	2.1	2.0
Dogs	3.7	0		4.3
Bitches	1.2	0	3.7	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 11

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Pigment abnormalities	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Coat color change	0.4	0	0	0
Dogs	0.9	0	0	0
Bitches	0	0	0	0
Sebaceous cysts	3.3	7.9	8.5	14.2
Dogs	2.8	13.0	10.3	17.1
Bitches	3.6	4.5	7.3	11.2
Sebaceous adenitis	0	1.3	0	0
Dogs	0	0	0	0
Bitches	0	2.2	0	0
Hot spots	8.4	4.0	2.1	0
Dogs	12.1	0	0	0
Bitches	6.0	6.7	3.7	0
Excessive coat	1.1	1.3	0	0
Dogs	0.9	0	0	0
Bitches	1.2	2.2	0	0
Thin coat	1.1	0	2.1	0
Dogs	1.9	0	0	0
Bitches	0.6	0	3.7	0
Other skin disorders	0.7	0	0	2.0
Dogs	0.9	0	0	0
Bitches	0.6	0	0	3.7
Trauma / accidents	**11.0**	**4.0**	**10.7**	**8.1**
Fracture / broken bone	2.2	0	0	4.1
Dogs	1.9	0	0	4.3
Bitches	2.4	0	0	3.7
Lameness (not due to fracture or cruciate tear)	4.4	2.6	4.3	4.1
Dogs	8.4	3.2	0	0
Bitches	1.8	2.2	7.3	7.5
Laceration requiring stitches	2.2	1.3	2.1	0
Dogs	3.7	3.2	0	0
Bitches	1.2	0	3.7	0
Other trauma	2.2	0	4.3	0
Dogs	3.7	0	0	0
Bitches	1.2	0	7.3	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 12

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Infections / Infestations	**60.6**	**44.9**	**36.3**	**28.5**
Bacterial	**8.0**	**10.6**	**6.4**	**10.2**
Pneumonia	0.7	1.3	0	2.0
Dogs	0	0	0	0
Bitches	1.2	2.2	0	3.7
Prostatitis	0.4	0	0	0
Dogs	0.9	0	0	0
Cystitis	0.4	4.0	2.1	6.1
Dogs	0	0	0	0
Bitches	0.6	6.7	3.7	11.2
Tonsillitis	2.6	0	0	0
Dogs	2.8	0	0	0
Bitches	2.4	0	0	0
Septicemia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Lyme disease	1.5	4.0	2.1	0
Dogs	1.9	6.5	5.1	0
Bitches	1.2	2.2	0	0
Erlichiosis	0.7	0	0	0
Dogs	1.9	0	0	0
Bitches	0	0	0	0
Babesiosis	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Rocky Mountain Spotted Fever	0.4	1.3	0	0
Dogs	0.9	3.2	0	0
Bitches	0	0	0	0
Interdigital infection	0.4	0	2.1	0
Dogs	0	0	5.1	0
Bitches	0.6	0	0	0
Other bacterial infections	1.1	0	0	2.0
Dogs	0.9	0	0	0
Bitches	1.2	0	0	3.7

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 13

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Viral	**2.2**	**2.6**	**2.1**	**4.1**
Parvovirus	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Corona virus	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Distemper	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Tracheobronchitis (kennel cough)	2.2	2.6	2.1	4.1
Dogs	1.9	0	0	8.6
Bitches	2.4	4.5	3.7	0
Other viral infections	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Fungal	**0.7**	**0.0**	**2.1**	**2.0**
Ringworm	0	0	0	2.0
Dogs	0	0	0	0
Bitches	0	0	0	3.7
Other fungal infections	0.7	0	2.1	0
Dogs	0	0	0	0
Bitches	1.2	0	3.7	0
Parasitic	**51.1**	**31.7**	**25.6**	**12.2**
Giardia	8.0	4.0	4.3	0
Dogs	9.3	9.7	0	0
Bitches	7.2	0	7.3	0
Coccidia	6.9	1.3	2.1	2.0
Dogs	6.5	3.2	0	0
Bitches	7.2	0	3.7	3.7
Roundworms	2.2	0	0	0
Dogs	1.9	0	0	0
Bitches	2.4	0	0	0
Hookworms	1.5	2.6	0	0
Dogs	3.7	6.5	0	0
Bitches	0	0	0	0
Whipworms	2.6	1.3	0	0
Dogs	4.7	0	0	0
Bitches	1.2	2.2	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 14

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Tapeworms	5.1	5.3	4.3	0
Dogs	4.7	9.7	0	0
Bitches	5.4	2.2	7.3	0
Demodectic mange	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Sarcoptic mange	2.6	0	2.1	0
Dogs	0.9	0	0	0
Bitches	3.6	0	3.7	0
Ear Mites	6.2	13.2	10.7	4.1
Dogs	4.7	13.0	5.1	0
Bitches	7.2	13.4	14.6	7.5
Cheyletiella mites	4.4	4.0	0	2.0
Dogs	4.7	3.2	0	0
Bitches	4.2	4.5	0	3.7
Tick problems	0.7	0	2.1	0
Dogs	1.9	0	5.1	0
Bitches	0	0	0	0
Flea problems	10.2	0	2.1	4.1
Dogs	14.9	0	0	8.6
Bitches	7.2	0	3.7	0
Other parasitic infestations	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Oral - Dental	**35.4**	**73.9**	**70.5**	**12.2**
Malocclusion - overbite	0.7	0	0	0
Dogs	0.9	0	0	0
Bitches	0.6	0	0	0
Malocclusion - undershot	5.8	0	0	0
Dogs	3.7	0	0	0
Bitches	7.2	0	0	0
Level bite	1.8	0	0	0
Dogs	0.9	0	0	0
Bitches	2.4	0	0	0
Missing teeth	6.9	15.8	10.7	6.1
Dogs	7.5	22.7	15.4	8.6
Bitches	6.6	11.1	7.3	3.7
Gingivitis	14.6	46.2	51.3	6.1
Dogs	14.0	58.3	46.2	4.3
Bitches	15.0	37.9	54.9	7.5

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 15

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Other abnormal dentition	2.2	0	2.1	0
Dogs	1.9	0	5.1	0
Bitches	2.4	0	0	0
Other oral disorders	3.3	11.9	6.4	0
Dogs	1.9	16.2	10.3	0
Bitches	4.2	8.9	3.7	0
Behavior Problems	**12.1**	**0.0**	**4.3**	**4.1**
Possessive aggression	0.4	0	0	0
Dogs	0.9	0	0	0
Bitches	0	0	0	0
Fear aggression	1.1	0	0	0
Dogs	0.9	0	0	0
Bitches	1.2	0	0	0
Dominance aggression	0.7	0	0	0
Dogs	1.9	0	0	0
Bitches	0	0	0	0
Obsessive-compulsive disorder	1.5	0	0	0
Dogs	0.9	0	0	0
Bitches	1.8	0	0	0
Territorial aggression	0.7	0	0	0
Dogs	0.9	0	0	0
Bitches	0.6	0	0	0
Fly catchers syndrome	1.1	0	0	0
Dogs	0.9	0	0	0
Bitches	1.2	0	0	0
Phobias	0.7	0	0	0
Dogs	1.9	0	0	0
Bitches	0	0	0	0
Timid or extremely shy	0.7	0	0	0
Dogs	0.9	0	0	0
Bitches	0.6	0	0	0
Extremely fearful	1.1	0	0	0
Dogs	0.9	0	0	0
Bitches	1.2	0	0	0
Inappropriate urination	1.1	0	2.1	4.1
Dogs	0.9	0	0	4.3
Bitches	1.2	0	3.7	3.7
Separation anxiety	2.9	0	2.1	0
Dogs	2.8	0	0	0
Bitches	3.0	0	3.7	0
Other behavioral problems	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0

Table 49—Age Specific Veterinary Confirmed Health Related Disorder Rates (per 1000 dog years) Page 16

Disorder	Age in Years			
	0 – 4.9	**5 – 6.9**	**7 – 8.9**	**9+**
Congenital Birth Defects	**27.4**	**1.3**	**0.0**	**0.0**
Umbilical hernia	24.1	0	0	0
Dogs	15.9	0	0	0
Bitches	29.4	0	0	0
Inguinal hernia	2.2	1.3	0	0
Dogs	1.9	0	0	0
Bitches	2.4	2.2	0	0
Diaphragmatic hernia	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Club foot/feet	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Swimmer puppy	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Cleft lip	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Cleft palate	0	0	0	0
Dogs	0	0	0	0
Bitches	0	0	0	0
Other birth defects	1.1	0	0	0
Dogs	1.9	0	0	0
Bitches	0.6	0	0	0
Other Disorders				
Anal sacculitis	15.7	19.8	8.5	4.1
Dogs	16.8	22.7	5.1	0
Bitches	15.0	17.8	11.0	7.5

Table 50—Outcome for Health Disorders with 3 or More Cases

Health disorder	Confirmed reports[a]		Treated[a,b]		Cured[b]	
			N	%	N	%
Malignant neoplasm						
Adenocarcinoma	3	Yes	2	66.7	1	50.0
		No	1	33.3	0	0.0
Lymphoma	3	Yes	3	100.0	1	33.3
		No	0	0.0	0	0.0
Squamous cell	3	Yes	3	100.0	1	33.3
		No	0	0.0	0	0.0
Non malignant neoplasm						
Lipoma	15	Yes	8	53.3	8	100.0
		No	6	40.0	0	0.0
Papilloma	14	Yes	7	50.0	7	100.0
		No	7	50.0	0	0.0
Cardiovascular						
Heart murmur	174	Yes	50	28.7	0	0.0
		No	110	63.2	2	1.8
Mitral valve disease	153	Yes	81	52.9	2	2.5
		No	63	41.2	0	0.0
Heart arrhythmia	19	Yes	6	31.6	1	16.7
		No	11	57.9	1	9.1
Heart failure-unknown cause	11	Yes	8	72.7	0	0.0
		No	2	18.2	0	0.0
Cardiomyopathy	5	Yes	5	100.0	0	0.0
		No	0	0	0	0.0

[a] Number treated may not be equal to number of confirmed reports due to missing data.
[b] Not all diagnosed cases are treated and not all treated cases are cured.

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 2

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Allergies						
Allergic dermatitis due:						
To flea	32	Yes	32	100.0	16	50.0
		No	0	0.0	0	0.0
To inhaled allergens	28	Yes	26	92.9	7	26.9
		No	0	0.0	0	0.0
To food	20	Yes	17	85.0	5	29.4
		No	1	5.0	0	0.0
To contact	9	Yes	7	77.8	2	28.6
		No	1	11.1	0	0.0
To other	7	Yes	6	85.7	1	16.7
		No	1	14.3	1	100.0
Drug allergy	7	Yes	5	71.4	3	60.0
		No	1	14.3	0	0.0
Atopic rhinitis	3	Yes	3	100.0	0	0.0
		No	0	0.0	0	0.0
Endocrine						
Hypothyroidism	8	Yes	8	100.0	3	37.5
		No	0	0.0	0	0.0
Pancreatic insufficiency	3	Yes	3	100.0	2	66.7
		No	0	0.0	0	0.0
Gastrointestinal						
Gastritis	16	Yes	15	93.8	9	60.0
		No	1	6.3	1	100.0
Colitis	15	Yes	13	86.7	11	84.6
		No	1	6.7	1	100.0
Excessive diarrhea	14	Yes	14	100.0	12	85.7
		No	0	0.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 3

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Gastrointestinal (Cont'd)						
Excessive vomiting	4	Yes	3	75.0	3	100.0
		No	0	0.0	0	0.0
Foreign body	4	Yes	3	75.0	3	100.0
		No	1	25.0	1	100.0
Malabsorption	3	Yes	3	100.0	2	66.7
		No	0	0.0	0	0.0
Blood disorders						
Thrombocytopenia	11	Yes	4	36.4	1	25.0
		No	7	63.6	0	0.0
Urinary tract						
Bladder infections	27	Yes	27	100.0	25	92.6
		No	0	0.0	0	0.0
Bladder stones	6	Yes	6	100.0	5	83.3
		No	0	0.0	0	0.0
Urinary incontenence	6	Yes	6	100.0	5	83.3
		No	0	0.0	0	0.0
Kidney disease	5	Yes	3	60.0	0	0.0
		No	0	0.0	0	0.0
Kidney failure	5	Yes	2	40.0	0	0.0
		No	1	20.0	0	0.0
Neurological						
Syringomyelia	22	Yes	15	68.2	3	20.0
		No	8	36.4	0	0.0
Seizures of unknown Origin	17	Yes	11	64.7	5	45.5
		No	6	35.3	0	0.0
Seizures of known Origin	4	Yes	4	100.0	1	25.0
		No	0	0.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases (Cont'd)—Page 4

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Musculoskeletal						
Patella luxation	35	Yes	19	54.3	13	68.4
		No	13	37.1	1	7.7
Hip dysplasia	24	Yes	6	25.0	1	16.7
		No	17	70.8	0	0.0
Arthritis senior	22	Yes	20	90.9	2	10.0
		No	2	9.1	0	0.0
Degenerative disk disease	18	Yes	11	61.1	2	18.2
		No	7	38.9	0	0.0
Anterior cruciate ligament tear	8	Yes	7	87.5	6	85.7
		No	1	12.5	0	0.0
Spondylosis	3	Yes	1	33.3	0	0.0
		No	2	66.7	0	0.0
Arthritis autoimmune	3	Yes	3	100.0	0	0.0
		No	0	0.0	0	0.0
Eye						
Adult onset cataracts	34	Yes	3	8.8	2	66.7
		No	27	79.4	0	0.0
Dry eye	30	Yes	30	100.0	12	40.0
		No	0	0.0	0	0.0
Corneal abrasion	22	Yes	21	95.5	19	90.5
		No	1	4.5	0	0.0
Retinal folds	17	Yes	0	0.0	0	0.0
		No	17	100.0	2	11.8
Distichiasis	15	Yes	3	20.0	2	66.7
		No	11	73.3	0	0.0
Corneal dystrophy	15	Yes	3	20.0	0	0.0
		No	12	80.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 5

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Eye (cont'd)						
Injury	12	Yes	12	100.0	11	91.7
		No	0	0.0	0	0.0
Corneal ulcers	9	Yes	8	88.9	6	75.0
		No	1	11.1	0	0.0
Ear						
Chronic ear infection	37	Yes	36	97.3	19	52.8
		No	0	0.0	0	0.0
Hearing problem	35	Yes	8	22.9	1	12.5
		No	25	71.4	0	0.0
Acute ear infection	30	Yes	29	96.7	28	96.6
		No	0	0.0	0	0.0
Reproductive (female)						
Cesarian	54	Yes	39	72.2	24	61.5
		No	1	1.9	1	100.0
Difficult whelping	18	Yes	12	66.7	4	33.3
		No	2	11.1	0	0.0
Pyometra	14	Yes	14	100.0	14	100.0
		No	0	0.0	0	0.0
Failure to carry to term	12	Yes	4	33.3	0	0.0
		No	7	58.3	0	0.0
Premature delivery	6	Yes	3	50.0	0	0.0
		No	2	33.3	0	0.0
Chronic false pregnancy	6	Yes	3	50.0	3	100.0
		No	2	33.3	0	0.0
Irregular heat cycles	5	Yes	1	20.0	1	100.0
		No	4	80.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 6

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Reproductive (female)—(cont'd)						
Infertility	3	Yes	2	66.7	1	50.0
		No	0	0.0	0	0.0
Mastitis	3	Yes	3	100.0	3	100.0
		No	0	0.0	0	0.0
Malformed puppies	3	Yes	0	0.0	0	0.0
		No	2	66.7	0	0.0
Reproductive (male)						
Low sperm count	6	Yes	4	66.7	2	50.0
		No	2	33.3	0	0.0
Cryptorchidism unilateral	5	Yes	4	80.0	4	100.0
		No	1	20.0	0	0.0
Abnormal semen	4	Yes	3	75.0	2	66.7
		No	1	25.0	0	0.0
Enlarged prostate	4	Yes	1	25.0	1	100.0
		No	3	75.0	0	0.0
Early sterility	3	Yes	3	100.0	1	33.3
		No	0	0.0	0	0.0
Skin						
Sebaceous cysts	28	Yes	14	50.0	11	78.6
		No	14	50.0	1	7.1
Hot Spots	27	Yes	27	100.0	20	74.1
		No	0	0.0	0	0.0
Seborrhea	9	Yes	9	100.0	5	55.6
		No	0	0.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 7

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Skin (cont'd)						
Dull, dry skin/coat	6	Yes	6	100.0	5	83.3
		No	0	0.0	0	0.0
Thin coat	5	Yes	3	60.0	3	100.0
		No	1	20.0	0	0.0
Excessive coat	4	Yes	1	25.0	0	0.0
		No	3	75.0	0	0.0
Trauma / accidents						
Lameness requiring treatment	18	Yes	18	100.0	15	83.3
		No	0	0.0	0	0.0
Laceration requiring stitches	9	Yes	9	100.0	9	100.0
		No	0	0.0	0	0.0
Fracture	8	Yes	7	87.5	7	100.0
		No	1	12.5	0	0.0
Bacterial infections						
Cystitis	8	Yes	8	100.0	8	100.0
		No	0	0.0	0	0.0
Lyme disease	8	Yes	8	100.0	7	87.5
		No	0	0.0	0	0.0
Tonsillitis	7	Yes	7	100.0	7	100.0
		No	0	0.0	0	0.0
Pneumonia	4	Yes	3	75.0	3	100.0
		No	1	25.0	0	0.0
RMSF	3	Yes	3	100.0	3	100.0
		No	0	0.0	0	0.0
Viral						
Tracheobronchitis	11	Yes	9	81.8	9	100.0
		No	2	18.2	2	100.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 8

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Parasitic						
Ear mites	35	Yes	35	100.0	32	91.4
		No	0	0.0	0	0.0
Flea problems	31	Yes	30	96.8	25	83.3
		No	0	0.0	0	0.0
Giardia	27	Yes	26	96.3	24	92.3
		No	0	0.0	0	0.0
Coccidia	23	Yes	22	95.7	21	95.5
		No	0	0.0	0	0.0
Tapeworms	22	Yes	21	95.5	20	95.2
		No	1	4.5	1	100.0
Cheyletiella mites	16	Yes	16	100.0	15	93.8
		No	0	0.0	0	0.0
Whipworms	8	Yes	8	100.0	7	87.5
		No	0	0.0	0	0.0
Sarcoptic mange	8	Yes	8	100.0	8	100.0
		No	0	0.0	0	0.0
Roundworms	7	Yes	7	100.0	6	85.7
		No	0	0.0	0	0.0
Hookworms	6	Yes	6	100.0	5	83.3
		No	0	0.0	0	0.0
Tick problem	3	Yes	3	100.0	3	100.0
		No	0	0.0	0	0.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 9

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Nose & mouth						
Gingivitis	104	Yes	97	93.3	51	52.6
		No	7	6.7	0	0.0
Missing teeth	40	Yes	29	72.5	11	37.9
		No	9	22.5	2	22.2
Undershot	16	Yes	2	12.5	1	50.0
		No	14	87.5	0	0.0
Level bite	5	Yes	0	0.0	0	0.0
		No	5	100.0	1	20.0
Behavior problems						
Separation anxiety	9	Yes	6	66.7	4	66.7
		No	3	33.3	0	0.0
Inappropriate urination	6	Yes	5	83.3	3	60.0
		No	1	16.7	0	0.0
Obsessive / compulsive	4	Yes	2	50.0	1	50.0
		No	2	50.0	0	0.0
Fear aggression	3	Yes	2	66.7	0	0.0
		No	1	33.3	0	0.0
Fly catchers syndrome	3	Yes	1	33.3	0	0.0
		No	2	66.7	0	0.0
Extremely fearful	3	Yes	1	33.3	1	100.0
		No	1	33.3	0	0.0
Congenital						
Umbilical hernia	71	Yes	46	64.8	45	97.8
		No	23	32.4	1	4.3
Inguinal hernia	7	Yes	5	71.4	5	100.0
		No	2	28.6	1	50.0

Table 50—Outcome for Health Disorders with 3 or More Cases—(Cont'd)--Page 10

Health disorder	Confirmed reports		Treated[a]		Cured	
			N	%	N	%
Other						
Anal sacculitis	66	Yes	65	98.5	52	80.0
		No	0	0.0	0	0.0

Table 51—Management for 24 CKCSs with Behavior Problems[a]

	N	%
Professional counseling or behavior modification	9	37.5
Medical treatment	4	16.7
Euthanasia was considered[b]	1	4.2
Not specified	10	41.7

[a] Based on prevalence of veterinary-confirmed behavior problems in Table 38.
[b] Behavior problem was listed as cause of death or euthanasia for none of the 88 CKCSs that died in this survey

Section V. Association Between Health Disorders, Host Factors, and Environment

Table 52—Gender and Health Disorder

Gender	Health Disorder		P value [a] for Gender Difference
Urinary Incontinence			
	Yes	No	
Bitches	6 (1.7)	339 (98.3)	
Dogs	0 (0.0)	221 (100)	0.08
Bladder Infection			
	Yes	No	
Bitches	22 (6.4)	323 (93.6)	
Dogs	5 (2.3)	216 (97.7)	0.03
Heart Murmur			
	Yes	No	
Bitches	97 (28.1)	248 (71.9)	
Dogs	77 (34.8)	144 (65.2)	0.09
Mitral Valve			
	Yes	No	
Bitches	89 (25.8)	256 (74.2)	
Dogs	64 (29.0)	157 (71.0)	0.41

[a] $P < 0.05$ indicates the association is statistically significant, that is, a less than 5% probability this association occurred by chance alone.

Table 53—Association between Gender, Neuter Status, and Urinary Incontinence

Neuter Status	Urinary Incontinence - Bitches		P value [a] for Neuter Status Difference
	Yes	No	
Neutered	6 (2.5)	236 (97.5)	
Intact	0 (0.0)	99 (100)	0.19

[a] $P < 0.05$ indicates the association is statistically significant, that is, a less than 5% probability this association occurred by chance alone.

Table 54—Association between Body Condition and Health Disorders

Body Condition	Health Disorder		P value[a]
	Musculoskeletal	**No Musculoskeletal**	
	Number (%)	Number (%)	
Puppy			
Underweight	7 (7.2)	40 (9.2)	0.51
Average	90 (92.8)	389 (89.8)	
Overweight	0 (0.0)	4 (1.0)	
Adult			
Underweight	3 (2.9)	9 (2.0)	0.05
Average	83 (80.6)	408 (89.3)	
Overweight	17 (16.5)	40 (8.7)	
	Heart Murmur	**No Heart Murmur**	
	Number (%)	Number (%)	
Puppy			
Underweight	14 (8.7)	33 (8.9)	0.96
Average	146 (90.7)	333 (90.2)	
Overweight	1 (0.6)	3 (0.8)	
Adult			
Underweight	4 (2.3)	8 (2.1)	0.75
Average	149 (86.1)	342 (88.4)	
Overweight	20 (11.6)	37 (9.5)	
	Mitral Valve	**No Mitral Valve**	
	Number (%)	Number (%)	
Puppy			
Underweight	8 (5.8)	39 (10.0)	0.32
Average	130 (93.5)	349 (89.2)	
Overweight	1 (0.7)	3 (0.8)	
Adult			
Underweight	3 (2.0)	9 (2.2)	0.89
Average	134 (88.7)	357 (87.3)	
Overweight	14 (9.3)	43 (10.5)	

* $P < 0.05$ indicates the association is statistically significant, that is, a less than 5% probability this association occurred by chance alone.

Table 55—Musculoskeletal Disorders by Adult Body Weight

Measurement	Bitches			Dogs		
	Disease Yes Number (%)	Disease No Number (%)	P value	Disease Yes Number (%)	Disease No Number (%)	P value [a]
Weight (pounds)						
1st tercile[b]	5 (11.1)	24 (14.1)		20 (35.1)	85 (31.3)	
2nd tercile	12 (26.7)	65 (38.2)		22 (38.6)	129 (47.4)	
3rd tercile	28 (62.2)	81 (47.7)	0.22	15 (26.3)	58 (21.3)	0.46

[a] $P < 0.05$ indicates the association is statistically significant, that is, a less than 5% probability this association occurred by chance alone.
[b] 1st tercile = 9-15.9 lb; 2nd tercile = 16-18.9 lb; 3rd tercile = 19+ lb

Table 56—Association between Coat Color and Health Disorders

Color of coat	Disorder		P-value[a]
	N (%)	N (%)	
	Any cardiovascular		
	Yes	No	
Black & tan	17 (43.6)	22 (56.4)	0.91
Ruby	23 (47.9)	25 (52.1)	
Tricolor	64 (42.4)	87 (57.6)	
Blenheim	147 (44.8)	181 (55.2)	
	Heart murmurs		
	Yes	No	
Black & tan	14 (35.9)	25 (64.1)	0.86
Ruby	16 (33.3)	32 (66.7)	
Tricolor	46 (30.5)	105 (69.5)	
Blenheim	98 (29.9)	230 (70.1)	
	Mitral Valve Disease		
	Yes	No	
Black & tan	7 (18.0)	32 (82.1)	0.43
Ruby	16 (33.3)	32 (66.7)	
Tricolor	43 (28.5)	108 (71.5)	
Blenheim	87 (26.5)	241 (73.5)	
	Any neurological		
	Yes	No	
Black & tan	3 (7.7)	36 (92.3)	0.15
Ruby	4 (8.3)	44 (91.7)	
Tricolor	21 (13.9)	130 (86.1)	
Blenheim	24 (7.3)	304 (92.7)	

Table 56—Association between Coat Color and Health Disorders—Page 2

Color of coat	Disorder		P-value[a]
	N (%)	N (%)	
	Syringomyelia		
	Yes	No	
Black & tan	1 (2.6)	38 (97.4)	0.95
Ruby	1 (2.1)	47 (97.9)	
Tricolor	7 (4.6)	144 (95.4)	
Blenheim	14 (4.3)	314 (95.7)	
	Any ear		
	Yes	No	
Black & tan	7 (18.0)	32 (82.1)	0.42
Ruby	4 (8.3)	44 (91.7)	
Tricolor	26 (17.2)	125 (82.8)	
Blenheim	59 (18.0)	269 (82.0)	
	Hearing problems		
	Yes	No	
Black & tan	1 (2.6)	38 (97.4)	0.29
Ruby	1 (2.1)	47 (97.9)	
Tricolor	7 (4.6)	144 (95.4)	
Blenheim	26 (7.9)	302 (92.1)	
	Any eye		
	Yes	No	
Black & tan	9 (23.1)	30 (76.9)	0.65
Ruby	12 (25.0)	36 (75.0)	
Tricolor	40 (26.5)	111 (73.5)	
Blenheim	70 (21.3)	258 (78.7)	

Table 57—Association between Family History and Syringomyelia

Any first degree relatives with syringomyelia?	Disorder		P-value[a]
	N (%)	N (%)	
	Suspected Syringomyelia		
	Yes	No	
Yes	9 (47.4)	10 (52.6)	0.001
No	38 (16.7)	189 (83.3)	
	Confirmed Syringomyelia		
	Yes	No	
Yes	5 (55.6)	4 (44.4)	0.52
No	17 (43.6)	22 (56.4)	

[a] $P < 0.05$ indicates the association is statistically significant, that is, a less than 5% probability this association occurred by chance alone.

Table 58—Association between Ear Infections and Hearing Problems

	Hearing problems		
	Yes N (%)	No N (%)	P value[a]
Ever diagnosed with ear infections?			
Yes	4 (11.4)	31 (88.6)	0.98
No	60 (11.3)	471 (88.7)	

[a] P = 0.98 indicates that there is no association between ear infections and hearing problems

Table 59—Association between Dietary Supplements and Health Disorders

Any daily supplements?	Disorder		P Value
	N (%)	N (%)	
	Any Heart Disease		
	Yes	No	
Yes	144 (47.7)	158 (52.3)	0.09
No	107 (40.5)	157 (59.5)	
	Heart Murmur		
	Yes	No	
Yes	100 (33.1)	202 (66.9)	0.19
No	74 (28.0)	190 (72.0)	
	Mitral Valve Disease		
	Yes	No	
Yes	82 (27.2)	220 (72.9)	0.95
No	71 (26.9)	193 (73.1)	
	Any Neurological Disease		
	Yes	No	
Yes	30 (9.9)	272 (90.1)	0.51
No	22 (8.3)	242 (91.7)	
	Syringomyelia		
	Yes	No	
Yes	13 (4.3)	289 (95.7)	0.76
No	10 (3.8)	254 (96.2)	

Section VI. Mortality Related Information

Figure 11—Cause of 88 CKCS Deaths

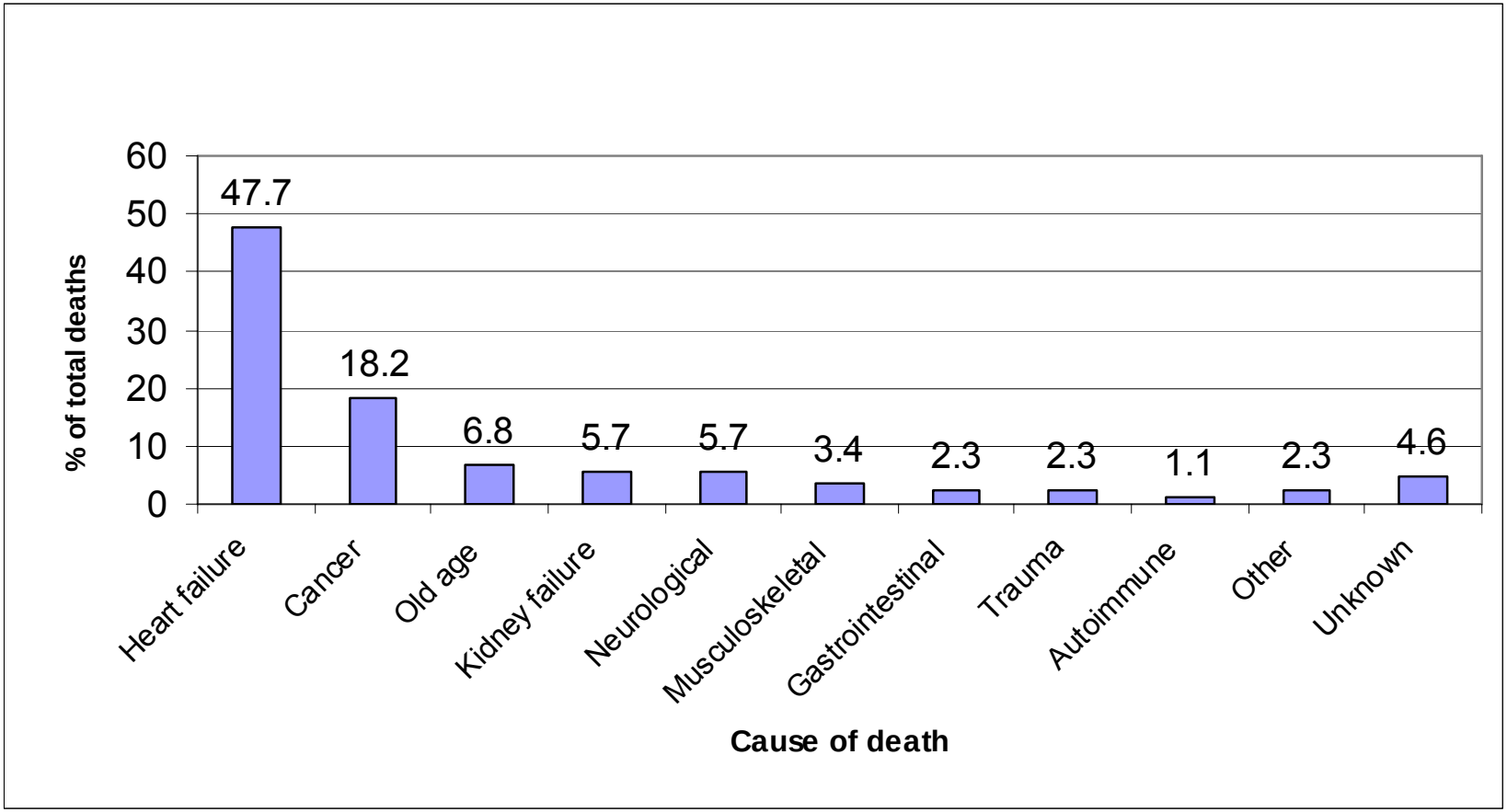


Figure 12— Veterinary-Confirmed Causes of 68 Deaths in CKCSs

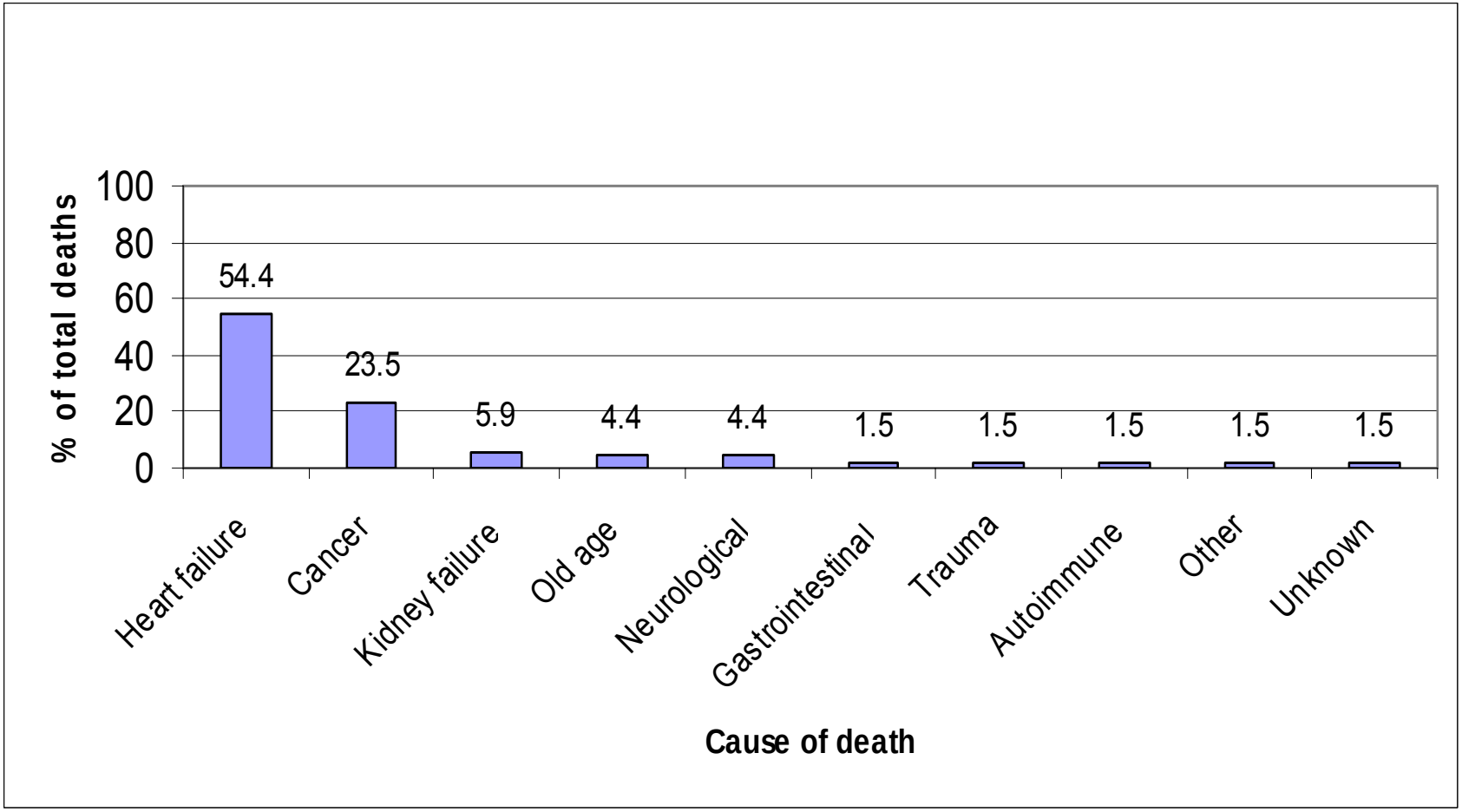


Table 60—Veterinary Confirmed Cause of 68 Deaths by Age

Cause of death	Age at death (years)				
	4 – 4.9	5 – 6.9	7 – 8.9	9+	All Ages
	N (%)	N (%)	N (%)	N (%)	N (%)
Heart failure	0	4 (66.7)	7 (63.6)	26 (54.2)	37 (54.4)
Cancer	0	1 (16.7)	2 (18.2)	13 (27.1)	16 (23.5)
Kidney failure	0	0	0	4 (8.3)	4 (5.9)
Old age	0	0	0	3 (6.3)	3 (4.4)
Musculoskeletal	0	0	0	0	0
Neurological	1 (33.3)	1 (16.7)	0	1 (2.1)	3 (4.4)
Gastrointestinal	1 (33.3)	0	0	0	1 (1.5)
Trauma	1 (33.3)	0	0	0	1 (1.5)
Autoimmune	0	0	1 (9.1)	0	1 (1.5)
Other	0	0	0	1 (2.1)	1 (1.5)
Unknown	0	0	1 (9.1)	0	1 (1.5)
Total	3 (100.0)	6 (100)	11 (100)	48 (100)	68 (100)

Table 61—Veterinary Confirmed Cause of 30 Deaths by Age for Dogs

Cause of death	Age at death (years)				
	4 – 4.9	5 – 6.9	7 – 8.9	9+	All Ages
	N (%)	N (%)	N (%)	N (%)	N (%)
Heart failure	0	1 (50.0)	1 (33.3)	12 (52.2)	14 (46.7)
Cancer	0	1 (50.0)	1 (33.3)	5 (21.7)	7 (23.3)
Kidney failure	0	0	0	4 (17.4)	4 (13.3)
Old age	0	0	0	1 (4.4)	1 (3.3)
Musculoskeletal	0	0	0	0	0
Neurological	1 (50.00)	0	0	1 (4.4)	2 (6.6)
Gastrointestinal	0	0	0	0	
Trauma	1 (50.0)	0	0	0	1 (3.3)
Autoimmune	0	0	0	0	0
Other	0	0	0	0	0
Unknown	0	0	1 (33.3)	0	1 (3.3)
Total	2 (100)	2 (100)	3 (100)	23 (100)	30 (100)

Table 62—Veterinary Confirmed Cause of 105 Deaths by Age for Bitches

Cause of death	Age at death (years)				
	4 – 4.9	5 – 6.9	7 – 8.9	9+	All Ages
	N (%)	N (%)	N (%)	N (%)	N (%)
Heart failure	0	3 (75.0)	6 (75.0)	14 (56.0)	23 (60.5)
Cancer	0	0	1 (12.5)	8 (32.0)	9 (23.7)
Kidney failure	0	0	0	0	0
Old age	0	0	0	2 (8.0)	2 (5.3)
Musculoskeletal	0	0	0	0	0
Neurological	0	1 (25.0)	0	0	1 (2.6)
Gastrointestinal	1 (100)	0	0	0	1 (2.6)
Trauma	0	0	0	0	0
Autoimmune	0	0	1 (12.5)	0	1 (2.6)
Other	0	0	0	1 (4.0)	1 (2.6)
Unknown	0	0	0	0	0
Total	1 (100)	4 (100)	8 (100)	25 (100)	38 (100)

Figure 13—Causes of Veterinary-Confirmed Deaths in CKCSs at 4 – 4.9 Years of Age (N = 3)

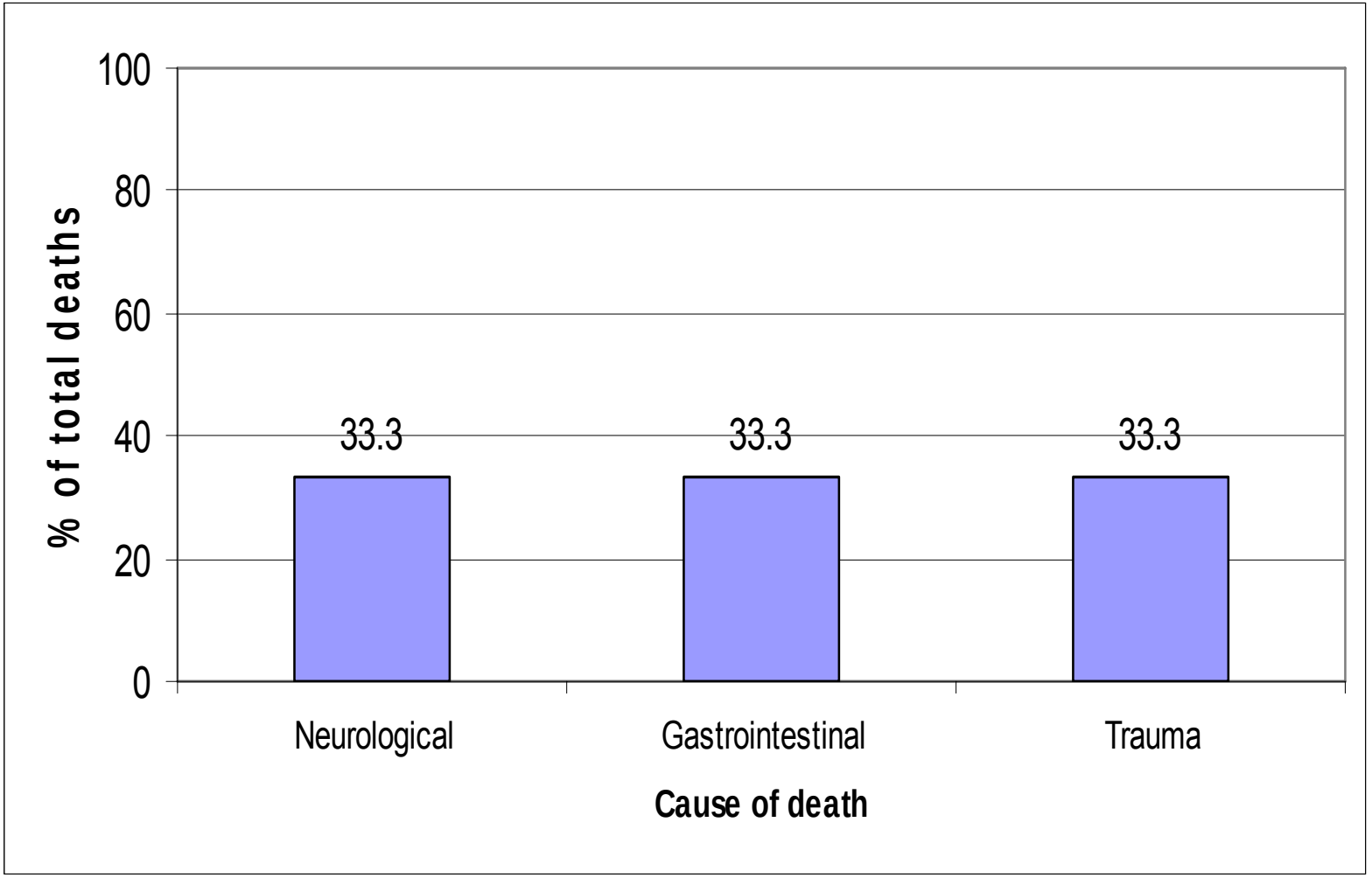


Figure 14—Cause of Veterinary-Confirmed Deaths in CKCSs at 5 – 6.9 Years of Age (N = 6)

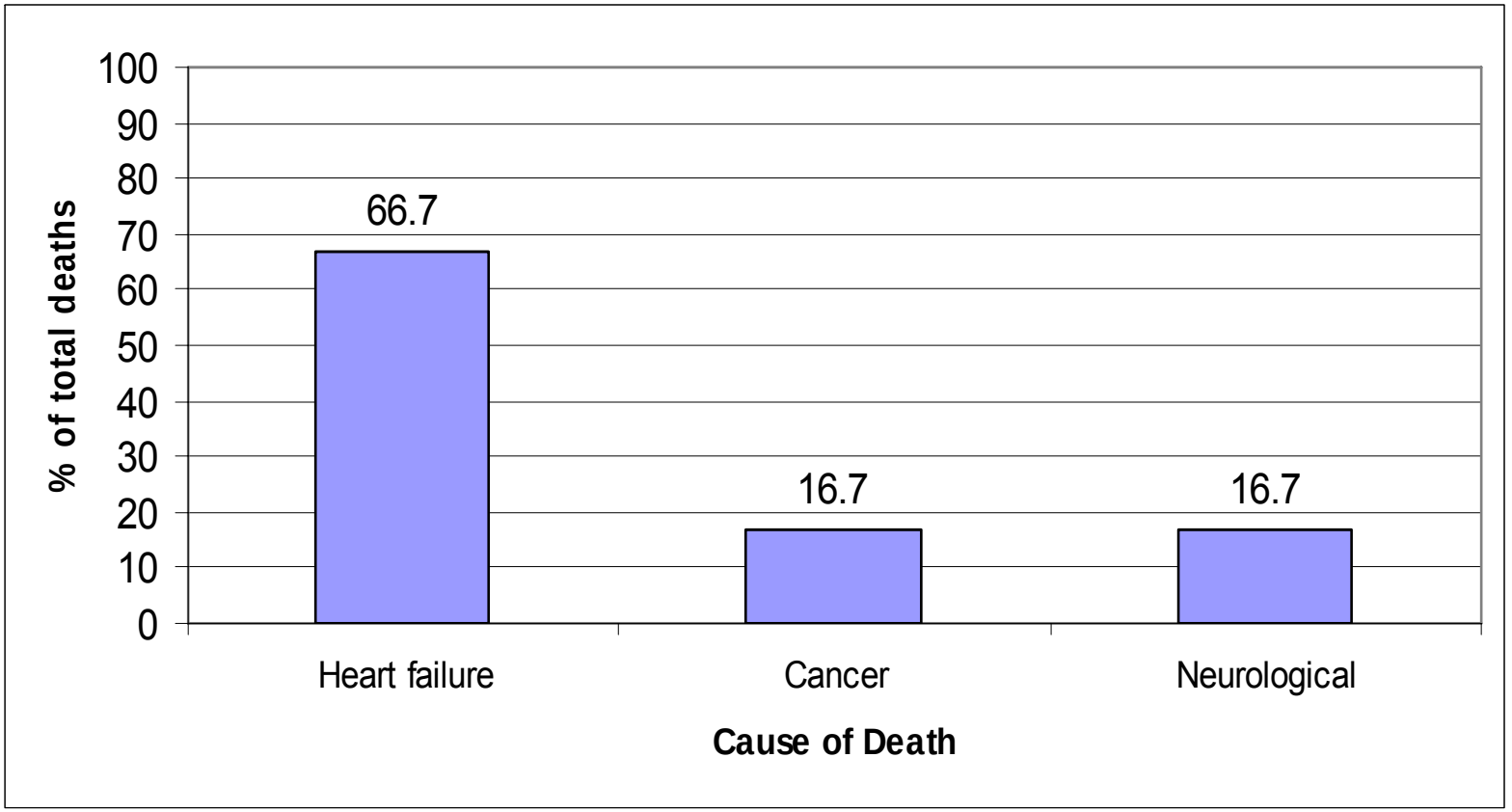


Figure 15—Cause of Veterinary-Confirmed Deaths in CKCSs at 7 - 8.9 Years of Age (N = 11)

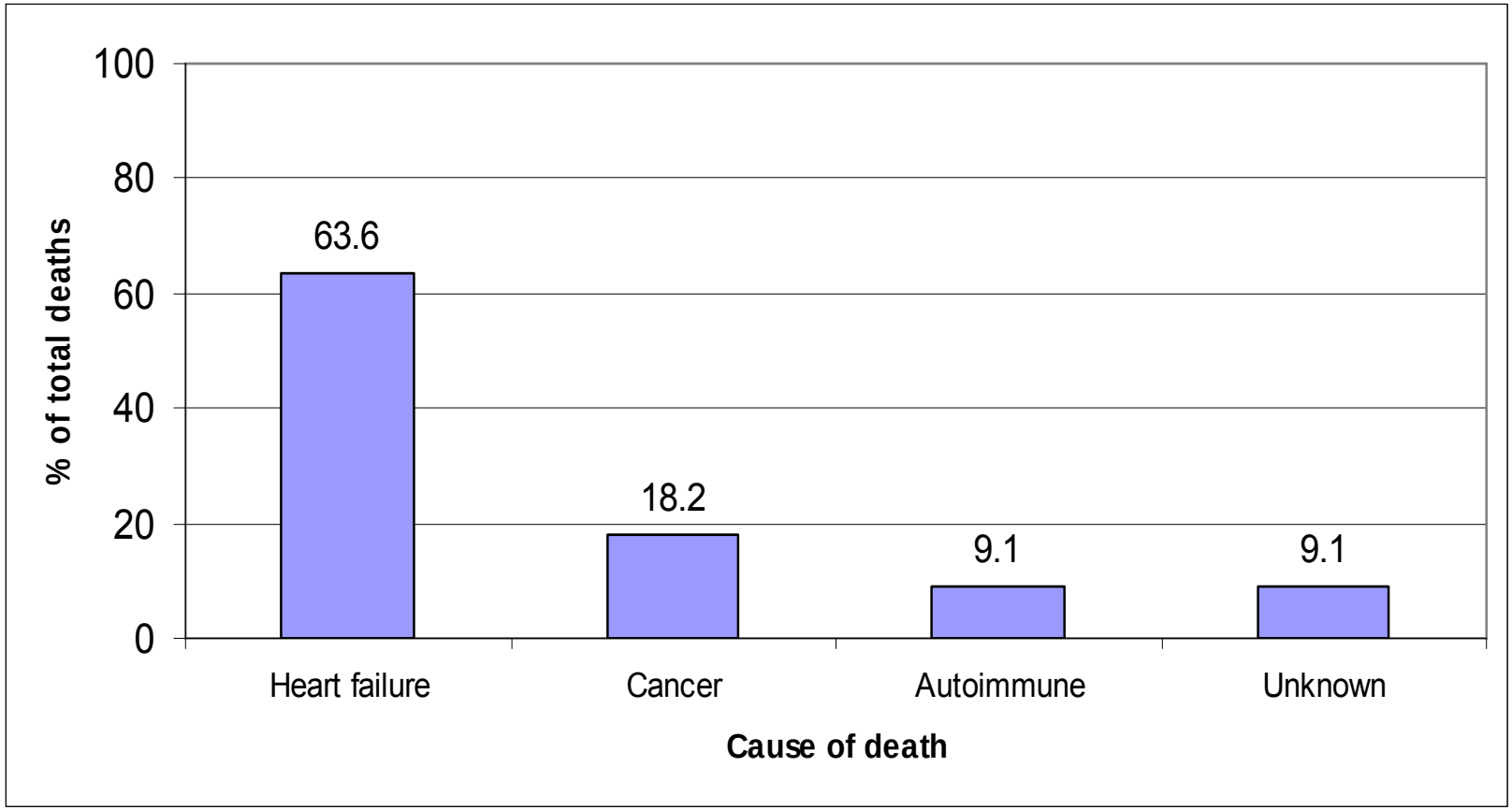


Figure 16—Cause of Veterinary-Confirmed Deaths in CKCSs at 9+ Years of Age (N = 48)

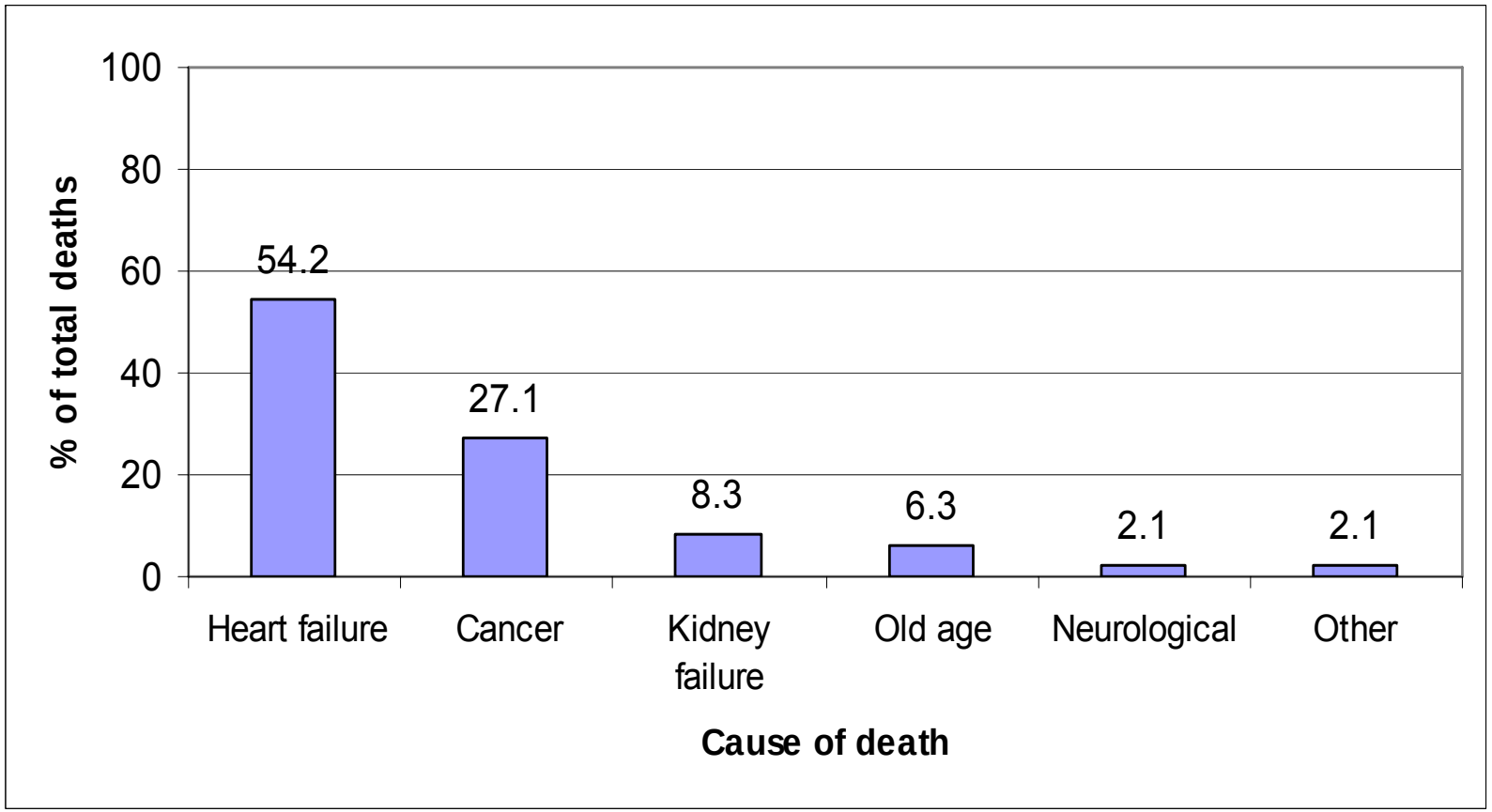


Figure 17—Heart Disease and Cancer as Causes of Disease

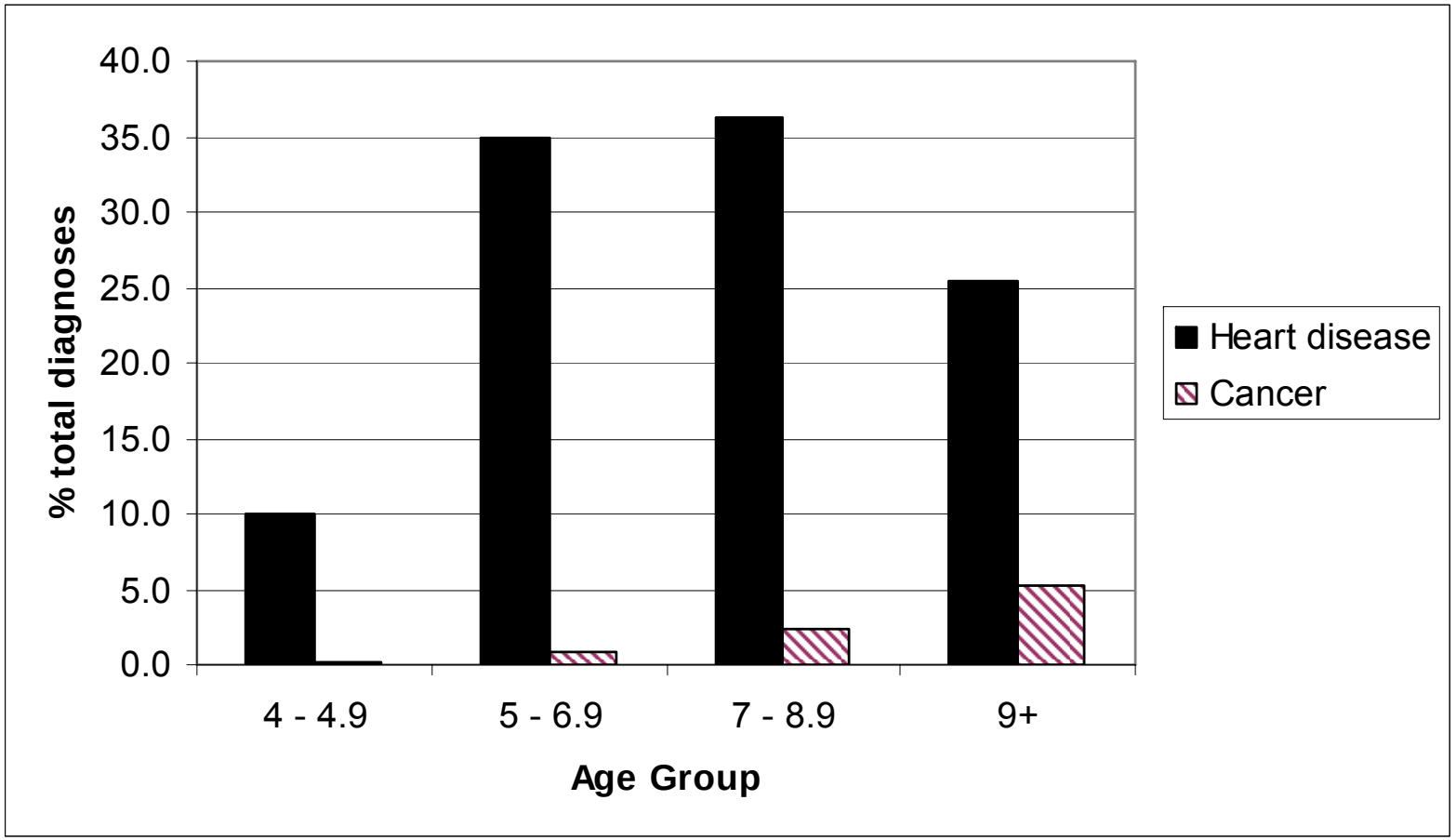


Table 63—Leading Causes of Death for Cavalier King Charles Spaniels, Irish Setters, Golden Retrievers, and Akitas

Breed	Leading Causes of Death	% of Veterinary Confirmed Deaths
Cavalier King Charles Spaniel		
	Cardiovascular	54.4
	Cancer	23.5
	Kidney Failure	5.9
Irish Setter		
	Cancer	37.6
	Kidney Failure	9.7
	Old Age	9.1
Golden Retriever		
	Cancer	61.4
	Neurological Disease	6.9
	Cardiovascular Disease	4.8
Akita		
	Cancer	21.4
	Gastric dilatation volvulus	21.4
	Musculoskeletal	15.5

Figure 18—Age- and Gender-Specific Death Rates

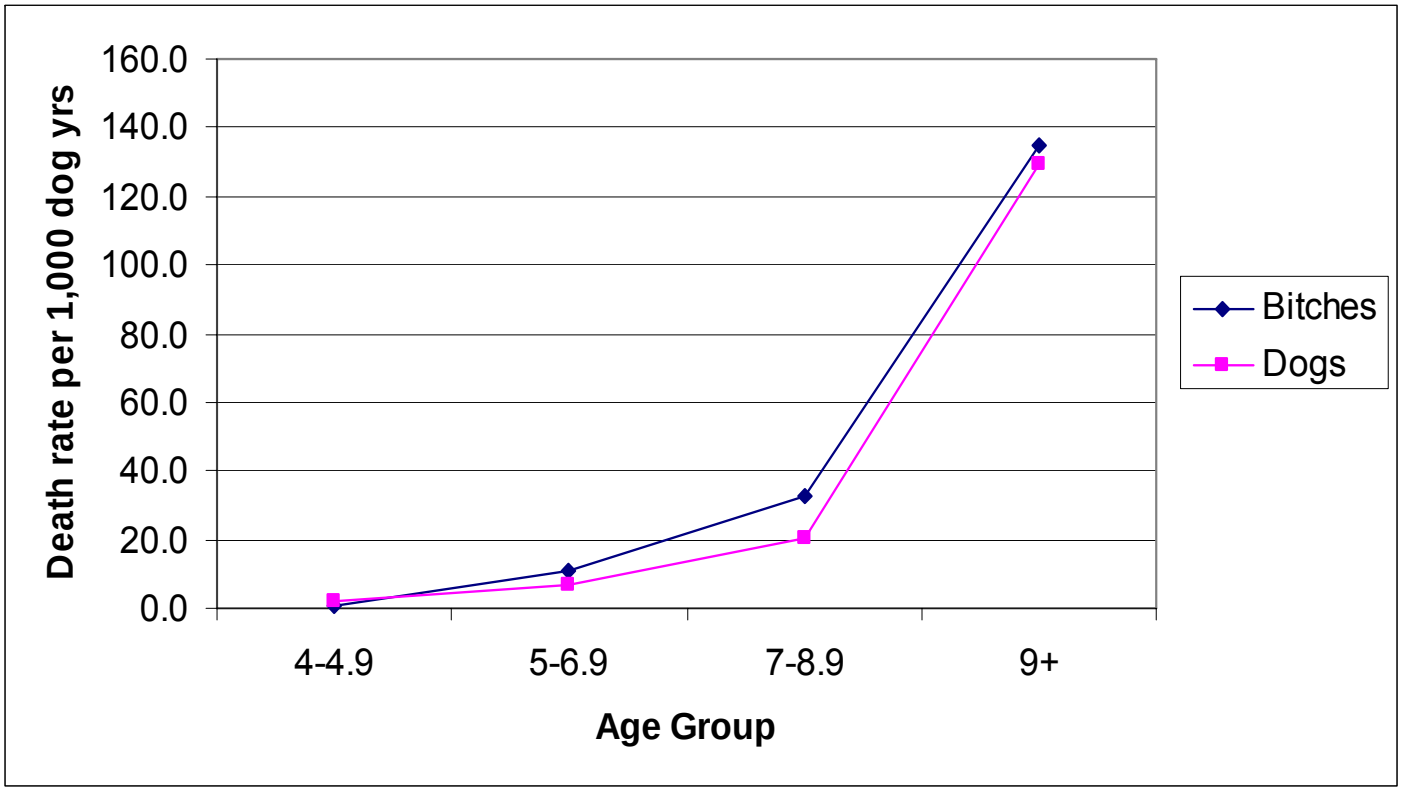


Table 64—Age & Gender Specific Death Rates per 1,000 Dog Years (All Deaths)

Category	4 –4.9 years		5 – 6.9 years		7 – 8.9 years		9+ years	
	N	Rate	N	Rate	N	Rate	N	Rate
All Cavalier King Charles Spaniels	3	1.1	7	9.2	13	27.8	65	132.3*
Bitches	1	0.6	5	11.1	9	32.9	36	134.5
Dogs	2	1.9	2	6.5	4	20.5	29	129.7

[a] This indicates that 13.2% of individuals in this age group will die each year, assuming a 10 year lifespan.

Table 65—Cause & Gender Specific Death Rates per 1,000 Dog Years

Cause of Death Confirmed by Veterinarian	All CKCSs		Bitches		Dogs	
	N [a] (%)	Rate	N [a] (%)	Rate	N [a] (%)	Rate
Heart failure	37 (54.4)	8.3	23 (60.5)	8.7	14 (46.7)	7.8
Cancer	16 (23.5)	3.6	9 (23.7)	3.4	7 (23.3)	3.9
Kidney failure	4 (5.9)	0.9	0	0	4 (13.3)	2.2
Old Age	3 (4.4)	0.7	2 (5.3)	0.8	1 (3.3)	0.6
Neurological	3 (4.4)	0.7	1 (2.6)	0.4	2 (6.7)	1.1
Gastrointestinal	1 (1.5)	0.2	1 (2.6)	0.4	0	0
Trauma	1 (1.5)	0.2	0	0	1 (3.3)	0.6
Autoimmune	1 (1.5)	0.2	1 (2.6)	0.4	0	0
Other	1 (1.5)	0.2	1 (2.6)	0.4	0	0
Unknown	1 (1.5)	0.2	0	0	1 (3.3)	0.6
All confirmed deaths	68 (100)	15.3	38 (100)	14.3	30 (100)	16.7
Cause of death not confirmed by veterinarian	20	4.5	13	4.9	7	3.9
All deaths	88	41.9	51	39.6	37	45.3

[a] Number of deaths that were confirmed by a veterinarian

Figure 19—Cause- and Gender-Specific Death Rates for CKCS

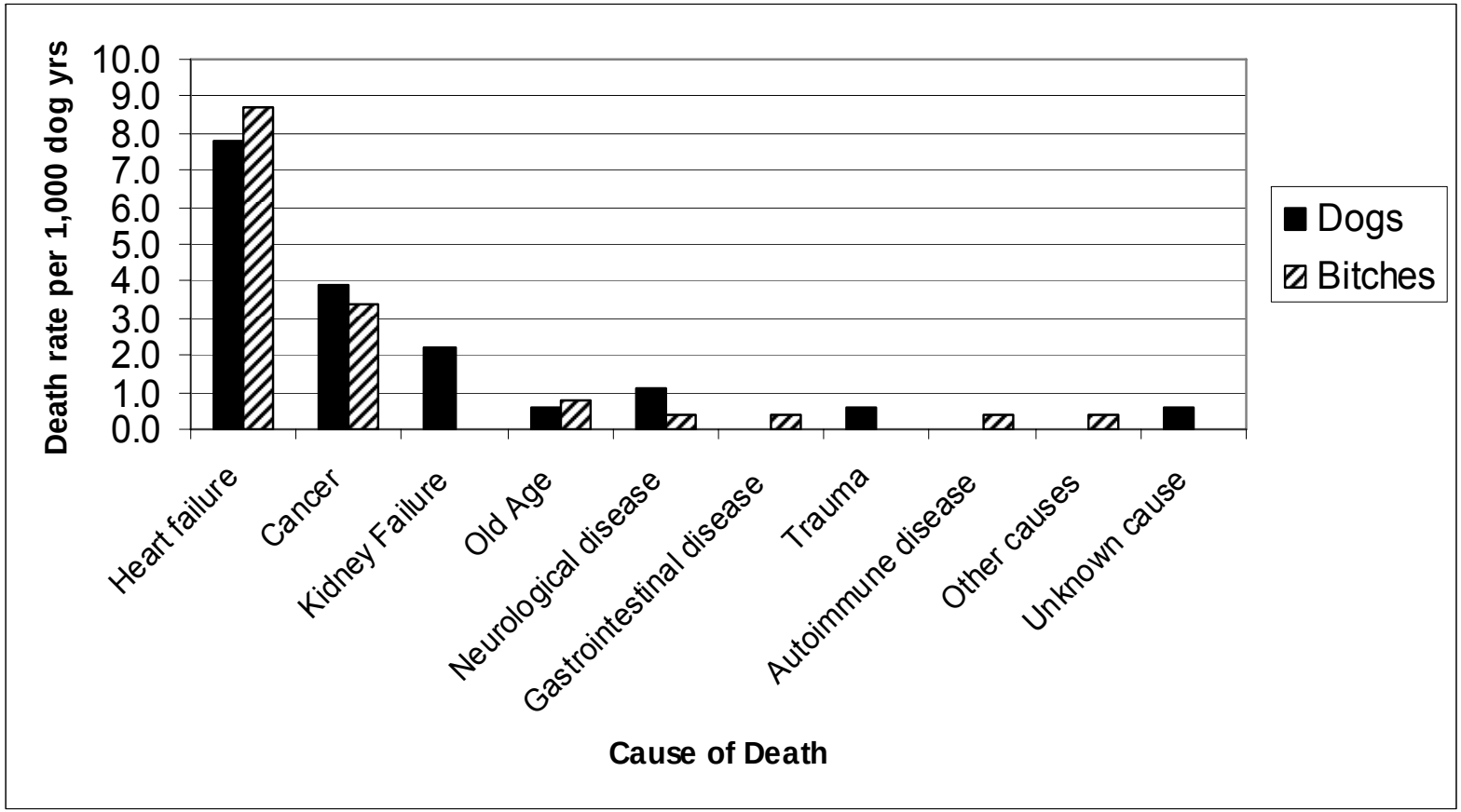


Table 66—Age & Cause Specific Death Rates per 1,000 Dog Years for the Three Leading Veterinary Confirmed Causes of Death (Excludes Unknown Causes)

Cause of death	4 – 4.9 years		5 – 6.9 years		7 – 8.9 years		9 + years	
	N	Rate	N	Rate	N	Rate	N	Rate
Bitches								
Heart failure	0	0	3	6.7	6	21.9	14	52.3 [a]
Cancer	0	0	0	0	1	3.7	8	29.9
Old age	0	0	0	0	0	0	2	7.5
Dogs								
Heart failure	0	0	1	3.2	1	5.1	12	53.6
Cancer	0	0	1	3.2	1	5.1	5	22.4
Kidney failure	0	0	0	0	0	0	4	17.9

[a] This indicates that 5.2 % of individuals in this age group will die due to a neoplasm each year, assuming a 10 year life span

Table 67—Age at Death in Years for the Eleven Most Common Causes of Death

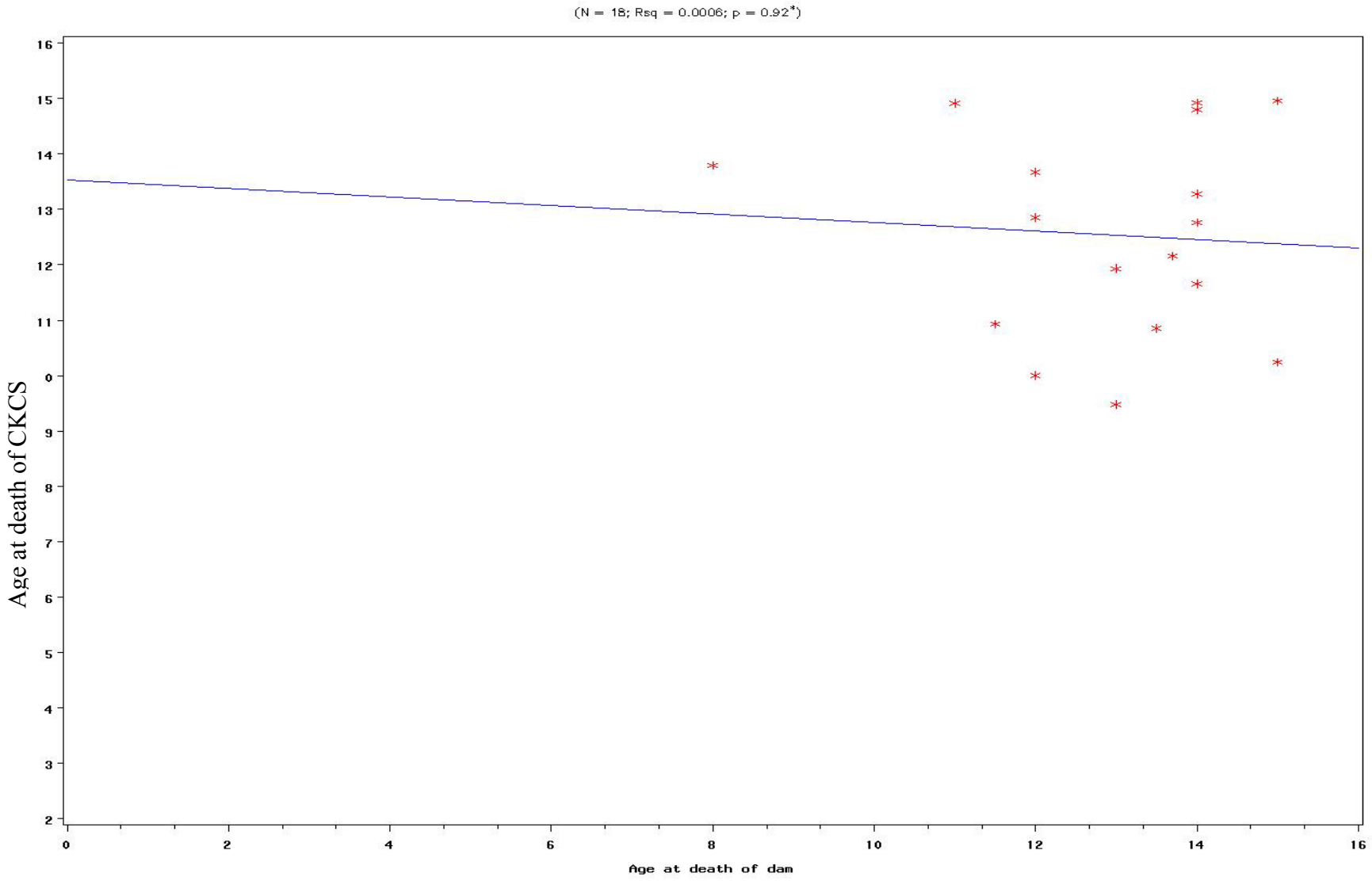
Cause of death	Veterinary Confirmed (N=68)		All Deaths [a] (N=88)	
	N (%)	Mean ±SD	N (%)	Mean ±SD
Heart failure	37 (54.4)	10.2±2.3	42 (47.7)	10.2±2.3
Cancer	16 (23.5)	10.9±2.5	16 (18.2)	10.9±2.5
Kidney failure	4 (5.9)	13.8±1.2	5 (5.7)	13.7±1.0
Old age	3 (4.4)	14.6±1.4	6 (6.8)	14.5±1.0
Musculoskeletal			3 (3.4)	10.1±3.9
Neurological	3 (4.4)	6.2±3.9	5 (5.7)	8.1±3.8
Gastrointestinal	1 (1.5)	3.2±0.0	2 (2.3)	8.4±7.2
Trauma	1 (1.5)	4.9±0.0	2 (2.3)	7.4±3.6
Autoimmune	1 (1.5)	8.0±0.0	1 (1.1)	8.0±0.0
Other	1 (1.5)	14.1±0.0	2 (2.3)	14.5±0.6
Unknown	1 (1.5)	7.7±0.0	4 (4.6)	10.5±2.1
All causes	68 (100.0)	10.4±3.0	88 (100.0)	10.7±2.9

[a] Veterinary confirmed deaths plus unconfirmed deaths

Table 68—Age at Death in Years by Place Where CKCS Obtained

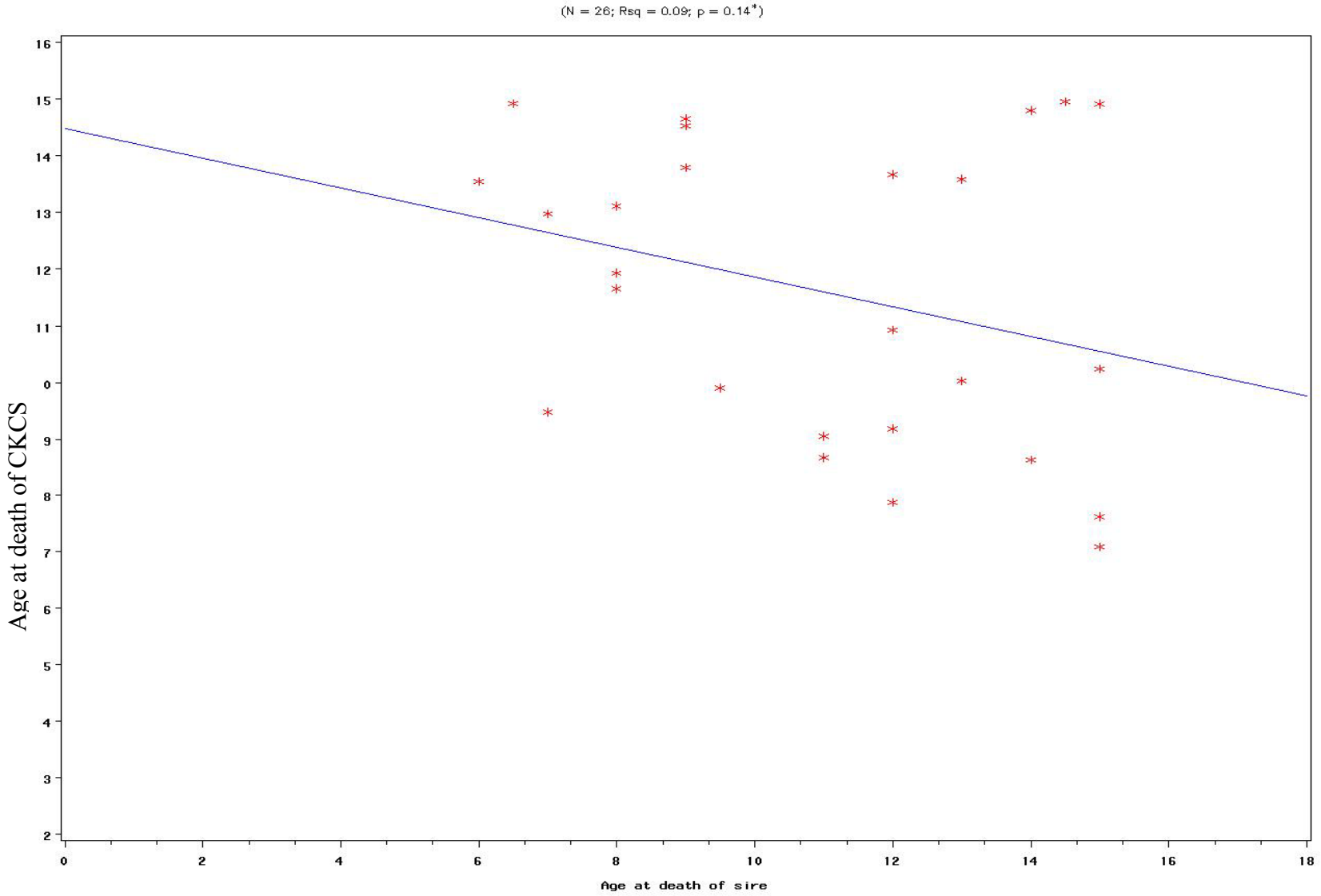
Source	Bitches		Dogs	
	N (%)	Mean ±SD	N (%)	Mean ±SD
Breeder – self	9 (18.0)	10.6±3.8	5 (14.7)	12.3±2.2
Breeder – kennel	16 (32.0)	11.0±3.0	10 (29.4)	11.7±2.5
Breeder – other home	22 (44.0)	10.3±2.8	19 (55.9)	10.1±3.3
Shelter or rescue	3 (6.0)	10.1±0.9	0	0
Pet store	0	0	0	0
Other				

Figure 20—Association Between Age at Death and Age at Death of Dam



*The probability that this relationship occurred by chance alone is 92 in 100

Figure 21—Association Between Age at Death and Age at Death of Sire



*The probability that this relationship occurred by chance alone is 14 in 100

Table 69—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders. The risk was based on 88 CKCSs that died.

Disorders	Number of dogs affected		Lifetime risk[b]
	N[a]	%	
Malignant neoplasms			
Any	16	18.2	1 in 6
Unknown neoplasm	6	6.8	1 in 15
Squamous cell carcinoma	3	3.4	1 in 29
Non-malignant neoplasms			
Any	5	5.7	1 in 18
Lipoma	3	3.4	1 in 29
Cardiovascular			
Any	72	81.8	1 in 1.2
Mitral valve disease	51	58.0	1 in 2
Heart murmur	44	50.0	1 in 2
Heart failure	7	8.0	1 in 13
Cardiomyopathy	3	3.4	1 in 29
Heart arrhythmia	3	3.4	1 in 29
Allergies			
Any	15	17.1	1 in 6
Allergic dermatitis due to:			
Fleas	9	10.2	1 in 10
Food	4	4.6	1 in 22
Endocrine			
Any	6	6.8	1 in 15
Hypothyroid	3	3.4	1 in 29

[a] Among specific disorders only those with 3 or more cases have been listed
[b] Rounded up or down

Table 69—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders. The risk was based on 88 CKCSs that died (cont'd)—Page 2

Disorders	Number of dogs affected		Lifetime risk
	N	%	
Gastrointestinal			
Any	10	11.4	1 in 9
Gastritis	4	4.6	1 in 22
Colitis	3	3.4	1 in 29
Hematological			
Any	3	3.4	1 in 29
Urinary tract			
Any	17	19.3	1 in 5
Bladder infections	11	12.5	1 in 8
Kidney failure	5	5.7	1 in 18
Kidney disease	4	4.6	1 in 22
Neurological			
Any	12	13.6	1 in 7
Seizures of unknown origin	3	3.4	1 in 29
Syringomyelia	3	3.4	1 in 29
Musculoskeletal			
Any	20	22.7	1 in 4
Arthritis senior	9	10.2	1 in 10
Degenerative disk disease	5	5.7	1 in 18
Patella luxation	4	4.6	1 in 22
Hip dysplasia	3	3.4	1 in 29
Anterior cruciate ligament tear	3	3.4	1 in 29
Eye			
Any	33	37.5	1 in 3
Cataracts adult onset	16	18.2	1 in 6
Dry eye	10	11.4	1 in 9
Corneal abrasion	3	3.4	1 in 29

Table 69—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders. The risk was based on 88 CKCSs that died (cont'd)—Page 3

Disorders	Number of dogs affected		Lifetime risk
	N	%	
Ears			
Any	20	22.7	1 in 4
Hearing problem	10	11.4	1 in 9
Chronic infection	9	10.2	1 in 10
Skin			
Any	15	17.1	1 in 6
Hot spots	9	10.2	1 in 10
Seborrhea	3	3.4	1 in 29
Sebaceous cyst	3	3.4	1 in 29
Reproductive (female)		% of 52 deaths in CKCS bitches	
Any	12	23.1	1 in 7
Cesarian	6	11.5	1 in 15
Pyometra	5	9.6	1 in 18
Difficult whelping	3	5.8	1 in 29
Reproductive (male)		% of 36 deaths in CKCS dogs	
Any	6	16.7	1 in 15
Trauma/Accidents			
Any	8	9.1	1 in 11
Laceration requiring stitches	3	3.4	1 in 29
Bacterial infections			
Any	9	10.2	1 in 10
Cystitis	4	4.6	1 in 22

Table 69—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders. The risk was based on 88 CKCSs that died (cont'd)—Page 4

Disorders	Number of dogs affected		Lifetime risk
	N	%	
Parasitic infestations			
Any	23	26.1	1 in 4
Ear mites	13	14.8	1 in 7
Flea problem	5	5.7	1 in 18
Tapeworms	4	4.6	1 in 22
Cheyletiella mites	4	4.6	1 in 22
Giardia	3	3.4	1 in 29
Nose & Mouth			
Any	34	38.6	1 in 3
Gingivitis	29	33.0	1 in 3
Missing teeth	6	6.8	1 in 15
Behavioral			
Any	7	8.0	1 in 13
Separation anxiety	4	4.6	1 in 22
Congenital			
Any	11	12.5	1 in 8
Umbilical hernia	11	12.5	1 in 8
Other			
Any	8	9.1	1 in 11
Anal sacculitis	8	9.1	1 in 11

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers.

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Malignant neoplasms					
Any	1 in 6	1 in 3	1 in 2	1 in 5	1 in 2
Unknown neoplasm	1 in 15	--	--	--	1 in 16
Squamous cell carcinoma	1 in 29	--	1 in 100	--	1 in 71
Non-malignant neoplasms					
Any	1 in 18	1 in 5	1 in 13	--	1 in 3
Lipoma	1 in 29	1 in 10	1 in 13	--	1 in 8
Cardiovascular					
Any	1 in 1.2	1 in 10	1 in 7	1 in 16	1 in 5
Heart murmur	1 in 2	1 in 30	1 in 25	--	1 in 6
Mitral valve disease	1 in 2	--	--	--	--
Heart failure	1 in 13	1 in 27	1 in 25	--	1 in 42
Cardiomyopathy	1 in 29	1 in 48	1 in 50	--	1 in 42
Heart arrhythmia	1 in 29	--	1 in 33	--	--

[a] Rounded up or down

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 2**.**

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Allergies					
Any	1 in 6	1 in 6	1 in 4	1 in 4	1 in 4
Allergic dermatitis due to:					
Fleas	1 in 10	1 in 15	1 in 6	1 in 13	1 in 6
Food	1 in 22	1 in 14	1 in 25	1 in 13	1 in 15
Endocrine					
Any	1 in 15	1 in 3	1 in 4	1 in 3	1 in 6
Hypothyroid	1 in 29	1 in 4	1 in 4	1 in 3	1 in 13
Gastrointestinal					
Any	1 in 9	1 in 3	1 in 8	1 in 3	1 in 7
Gastritis	1 in 22	1 in 24	1 in 33	--	1 in 34
Colitis	1 in 29	1 in 27	1 in 100	--	1 in 23
Hematological					
Any	1 in 29	1 in 30	1 in 25	--	1 in 21

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 3

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Urinary tract					
Any	1 in 5	1 in 5	1 in 8	1 in 6	1 in 4
Bladder infections	1 in 8	1 in 14	1 in 14	1 in 13	1 in 23
Kidney failure	1 in 18	1 in 14	1 in 25	1 in 56	1 in 8
Kidney disease	1 in 22	1 in 40	1 in 33	--	1 in 11
Neurological					
Any	1 in 7	1 in 8	1 in 7	1 in 12	1 in 9
Seizures of unknown origin	1 in 29	1 in 19	1 in 13	1 in 23	1 in 17
Syringomyelia	1 in 29	--	--	--	--
Musculoskeletal					
Any	1 in 4	1 in 2	1 in 3	1 in 3	1 in 3
Arthritis senior	1 in 10	1 in 6	--	--	--
Degenerative disk disease	1 in 18	1 in 16	1 in 50	1 in 16	1 in 53
Patella luxation	1 in 22	--	1 in 100	--	--
Hip dysplasia	1 in 29	1 in 14	1 in 6	1 in 10	1 in 7
Anterior cruciate ligament tear	1 in 29	--	1 in 33	1 in 20	1 in 71

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 4

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Eye					
Any	1 in 3	1 in 8	1 in 5	1 in 14	1 in 6
Cataracts adult onset	1 in 6	1 in 16	1 in 8	1 in 42	1 in 9
Dry eye	1 in 9	--	--	--	--
Corneal abrasion	1 in 29	--	--	--	--
Ears					
Any	1 in 4	1 in 3	1 in 4	1 in 8	1 in 4
Hearing problem	1 in 9	--	1 in 20	1 in 42	1 in 15
Chronic infection	1 in 10	1 in 4	1 in 6	1 in 13	1 in 10
Skin					
Any	1 in 6	1 in 4	1 in 2	1 in 3	1 in 3
Hot spots	1 in 10	1 in 24	1 in 3	1 in 6	1 in 5
Seborrhea	1 in 29	--	1 in 50	1 in 42	1 in 26
Sebaceous cyst	1 in 29	1 in 13	1 in 7	--	1 in 7

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 5

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Reproductive (female)					
Any	1 in 7	1 in 4	1 in 5	1 in 4	1 in 6
Cesarian	1 in 15	--	--	--	--
Pyometra	1 in 18	1 in 15	1 in 25	1 in 13	1 in 13
Difficult whelping	1 in 29	1 in 34	1 in 50	--	1 in 26
Reproductive (male)					
Any	1 in 15	1 in 5	1 in 7	1 in 12	1 in 7
Trauma/Accidents					
Any	1 in 11	1 in 5	1 in 6	1 in 7	1 in 6
Laceration requiring stitches	1 in 29	1 in 11	1 in 13	1 in 12	1 in 19
Bacterial infections					
Any	1 in 10	1 in 5	1 in 3	1 in 7	1 in 4
Cystitis	1 in 22	1 in 30	1 in 20	--	1 in 42

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 6

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Parasitic infestations					
Any	1 in 4	1 in 3	1 in 2	1 in 3	1 in 3
Ear mites	1 in 7	--	--	--	--
Flea problem	1 in 18	1 in 13	--	--	1 in 8
Tapeworms	1 in 22	1 in 8	--	--	1 in 9
Cheyletiella mites	1 in 22	--	--	--	--
Giardia	1 in 29	1 in 17	1 in 13	1 in 18	1 in 42
Nose & Mouth					
Any	1 in 3	1 in 9	1 in 25	--	1 in 6
Gingivitis	1 in 3	1 in 22	--	--	--
Missing teeth	1 in 15	--	1 in 100	--	1 in 34
Behavioral					
Any	1 in 13	1 in 34	1 in 100	1 in 27	1 in 29
Separation anxiety	1 in 22	--	--	--	--
Congenital					
Any	1 in 8	1 in 8	1 in 100	--	1 in 29
Umbilical hernia	1 in 8	1 in 9	1 in 100	--	1 in 34

Table 70—Lifetime Risk of the Most Common Veterinary-Confirmed Health Disorders in CKCSs, Irish Setters, Golden Retrievers, Akitas, and Airedale Terriers (cont'd)—Page 7

Disorders	Lifetime risk[a]				
	CKCS	Irish Setter	Golden Retriever	Akita	Airedale Terrier
Other					
Any	1 in 11	1 in 15	1 in 33	1 in 20	1 in 21
Anal sacculitis	1 in 11	1 in 15	1 in 33	1 in 20	1 in 21

Figure 22—Survival of 566 CKCSs by Gender

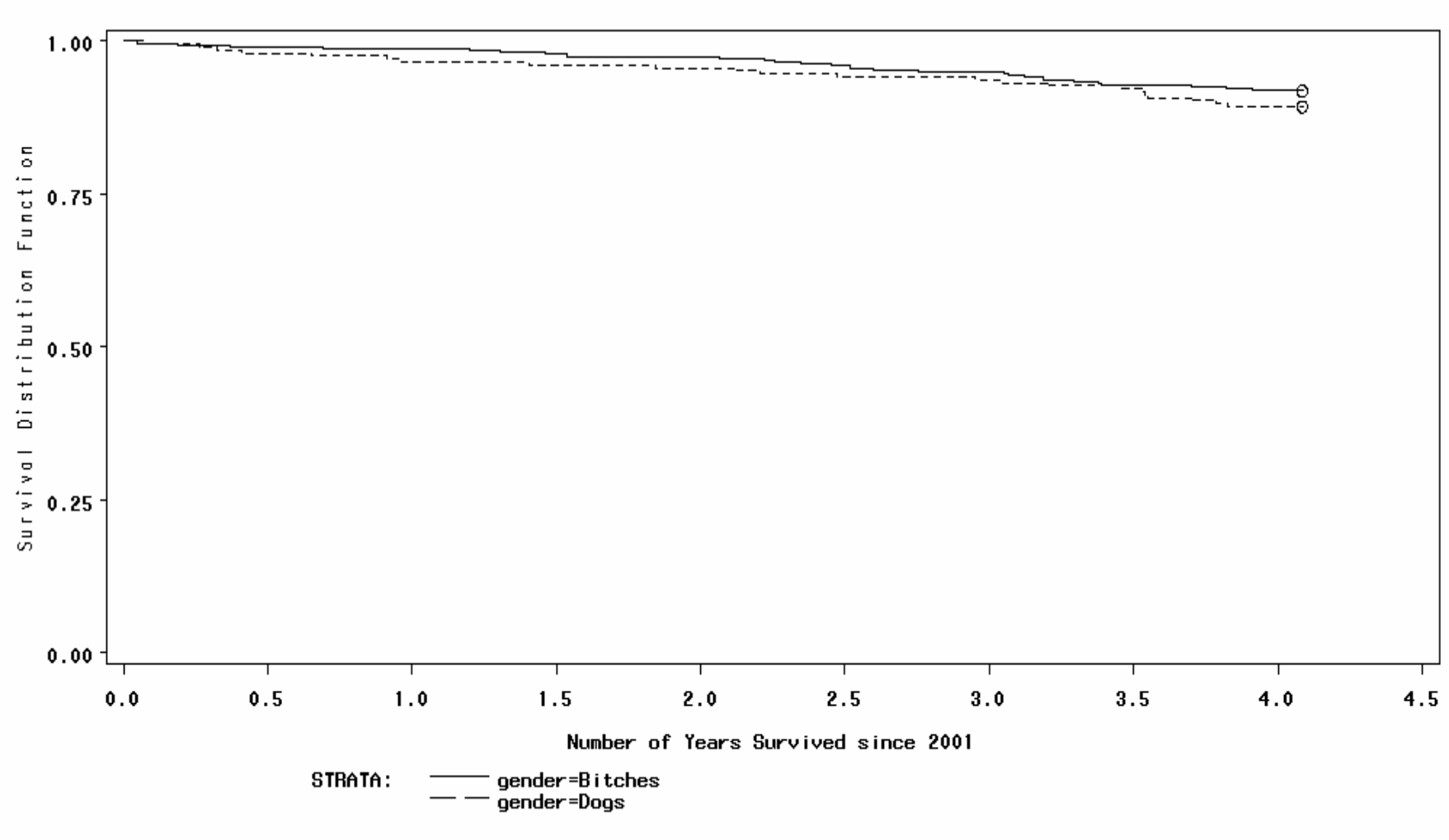
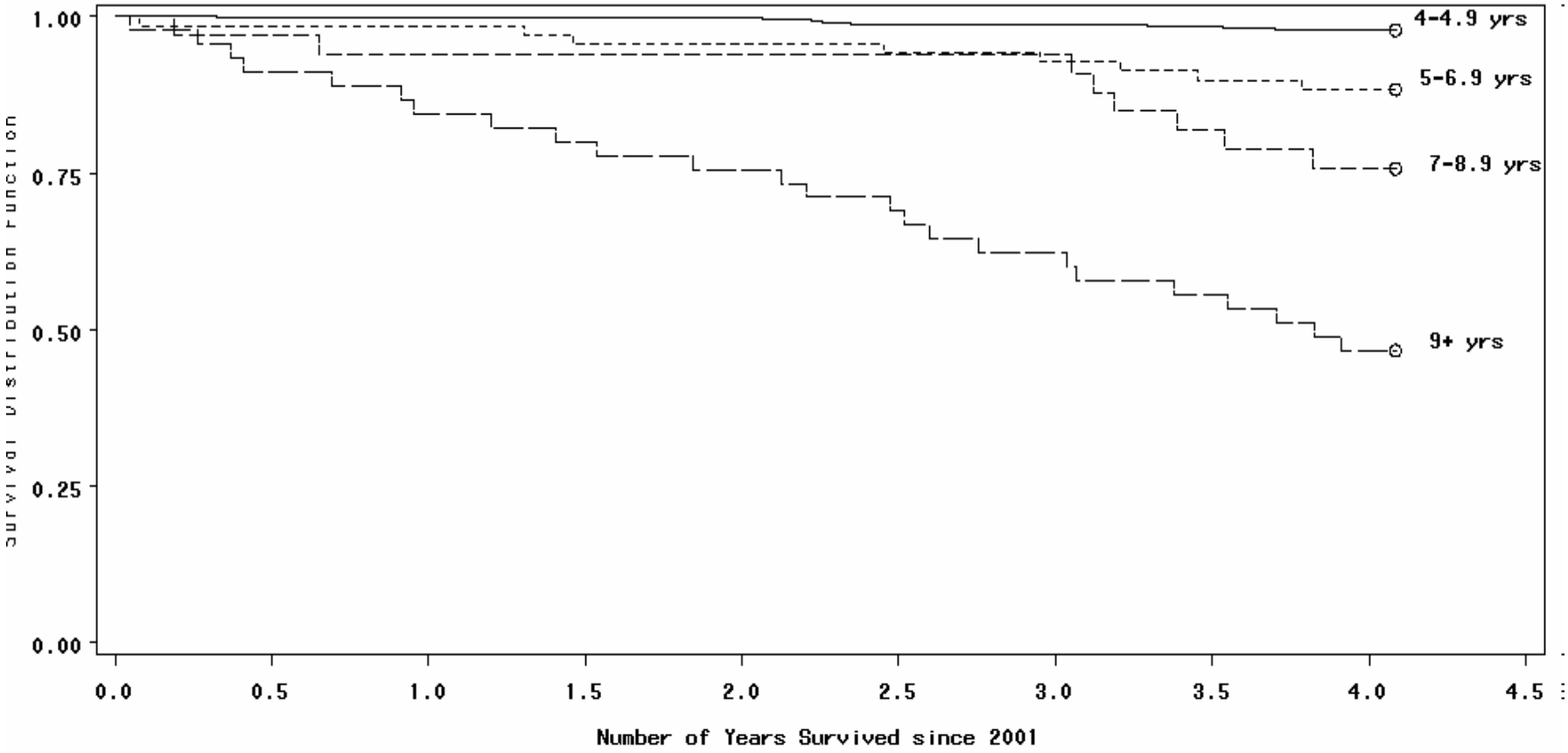


Figure 23—Survival of 566 CKCSs by Age



Section VII. Owner Perceptions vs Survey Results

Table 71—Three Most Important Health Related Disorders—Owner-Ranking Versus Actual Survey Results[a]

Ranking of importance / occurrence	**Owners' primary concern**		**Survey results**			
			Death		Disease or condition[b]	
	Disorder	% of owners' opinion	Cause	% of deaths	Cause	Lifetime risk
#1	Heart disease	76.0	Heart failure	54.4	Mitral valve disease	1 in 2
#2	Syringomyelia	16.0	Cancer	23.5	Heart murmur	1 in 2
#3	Cancer	1.6	Kidney failure	5.9	Gingivitis	1 in 3

[a] Based on veterinary-confirmed causes of disease only

III Interpretive Summaries and Comments on the Results of 2004 American Cavalier King Charles Spaniel Club (ACKCSC) Health Survey

Table 1

1. Usable questionnaires were received for 566 CKCSs from 313 owners. It was not possible to determine the exact response rate, because owners were encouraged to make copies of surveys for use by other CKCS owners and to download copies directly from the CKCS web site.
2. Thirty six surveys were ineligible for entry into the study either because the CKCSs were not alive as of January 1, 2001 (start of study), or because of missing information on vital status, or because an owner submitted information for > 5 CKCSs.
3. Most (188 or 60%) owners submitted only one questionnaire. The instructions with the questionnaire asked that no owner submit a survey for >5 CKCSs alive in 2001.
4. A total of 1084 CKCSs were living with 307 owners at the time of survey. Most of the respondents were currently living with either one (33.9%) or 2-5 (42.5%) CKCS. In 2001, a total of 782 CKCSs were living with the survey respondents. At that time, a majority of the owners (141 or 45.1%) were living with one CKCS. About 75% of the participants have been associated with CKCSs for >6 years. The most common primary interest in CKCSs reported by owners was companion animal/pet (89.8%) followed by show (37.7%) and breeding (34.2%). Many owners indicated more than one primary interest.

Table 2

1. Over half of the CKCSs in this survey were either whelped in someone else's home (38.3%) or whelped by the owners in their own home (21.4%). About one-third (33.2%) of the study population was whelped in a kennel. Very few of the CKCSs were obtained through a shelter or rescue organization (2.3%) or from a pet store (0.2%).
2. A vast majority of the CKCSs in the survey were bred for conformation (64.5%) while 29% were bred for companion / pet purposes.

Tables 3&4

1. The country in which a majority of CKCSs spent most of its lifetime was the United States (81.3%). Other countries listed included Canada (7.1%), Australia (3.5%) and

United Kingdom (3.2%). CKCSs from 37 states in the U.S. participated in this survey. California was the state with the highest representation (64 dogs;13.9%).

Table 5

1. The CKCSs in the survey that were the youngest as of February 1, 2005 contributed less information than those that were older, i.e., less years of follow-up. This was our primary reason for restricting entry to CKCSs that were alive on January 1, 2001.
2. The survey included 345 (60.9 %) bitches and 221 (39.1 %) dogs. As of February 1, 2005, 85.2% of the bitches and 83.3% of the dogs were still alive, while the rest had either died or were euthanatized.
3. A veterinarian had confirmed the cause of death for most (75%) of the 88 CKCS that died and were included in the survey. Only these veterinary confirmed deaths were used in many of the subsequent analyses. However, a necropsy exam had been performed in only 3.4% of all deaths. Many other important causes of death would have been identified if more CKCSs that died had been subjected to a post-mortem examination by a veterinarian. We encourage dog owners to have complete autopsies performed by a qualified veterinary pathologist in order to determine not only the cause of death, but also what other conditions might have been present that were not clinically apparent. This would greatly increase our understanding of causes of disease of the CKCS.

Table 6 and Figures 1 & 2

1. The average age of CKCS bitches and dogs at the start of the survey period in January 2001 was 3.9 and 4.4 years, respectively.
2. The ages of the bitches and dogs in the survey were approximately normally distributed. For dogs that were still alive as of February 1, 2005, the average age of the bitches and dogs was 7.2 and 7.6 years, respectively. The oldest bitch and dog were 18.7 years and 14.1 years of age, respectively. We purposely designed the survey so that the average age of the participating dogs would be between 7-8 years.
3. The average age at death for the bitches was 10.5 years and for the dogs was 10.9 years. The oldest bitch and dog that died were 14.9 years and 15.9 years of age, respectively. In most species of animals including humans and in several dog breeds previously surveyed by us, females outlived males. Based on the 88 deaths among the surveyed CKCSs, it

appears that the males tended to outlive the females. This was an unexpected finding. It may be therefore that in the CKCS breed, there is a disease or condition that specifically affects females causing them to die earlier.

Table 7

1. When owners were asked what competitions or events their dogs attended per year, the most common response was conformation shows (43.1%), followed by pet therapy visits (9.0%), agility trials (8.3%), and obedience trials (8.3%). About 45% of the CKCSs did not participate in any events.
2. The average number of conformation shows attended per year was 12. The average number of agility trials and obedience trials attended per year was 12.0 and 8.2, respectively. On average, CKCSs involved in pet therapy each undertook about 30 visits per year. In our experience, the CKCS breed is ideally suited for pet therapy and other service programs because of their size and disposition. Owners should be encouraged to pursue this type of activity since it is good for both the dogs, owners, and society.

Table 8

1. A majority (80.7%) of the CKCSs were primarily kept free in the house. About 10% of the CKCSs were primarily kept in a crate in the house while 5% were reported to be kept primarily in a kennel, either indoors or outside.
2. Many CKCSs always (33.4%), sometimes (29.3%), or usually (13.1%), slept in their owner's bed. This indicates a high degree of attachment between owner and dog. The proportion of CKCSs sleeping in their owner's bed was similar to that reported by owners of larger dogs such as Golden Retrievers, Airedale Terriers, and Irish Setters in previous health surveys we have done.

Table 9 and Figures 3 - 5

1. The height, weight, and body mass index (weight/height) were calculated separately for bitches and dogs. These were related to the daily diet as well as to specific health disorders in the latter part of the survey. The body mass index is often used in human studies as a measure of obesity, but is calculated as weight/height^2. Body mass index does

not work well in dogs because of the variety of shapes and sizes. However, it is useful for comparing dogs within a single breed as a measure of overweight or obesity.

2. The average height of the bitches (12.5 in) in the survey was within the range of heights for CKCS of 12 – 13 inches reported in published references (e.g., The Atlas of Dog Breeds of the World, B. Wilcox and C. Walkowicz, 5th edition, T.F.H. Publications, 1995). The average height of the CKCS dogs (13.3 inches) was slightly higher than the published standard height. We found that the actual heights of many breeds for which we conducted health surveys exceeded published heights and AKC breed standards, suggesting that most breeds are becoming taller over time (as in people). This may be the result of improved nutrition as is suspected in humans or the result of selective breeding of taller dogs.
3. The average weight of the bitches (16.8 lbs) was within the range of the standard breed weight (10 - 18 lbs) reported in the same reference above. However, the average weight of the dogs (18.7 lbs) was slightly greater than the typical reported breed weight. This suggests that CKCS dogs in this survey are more likely to weigh more than the standard weight published, or the published weight reference is in error.
4. Body mass index did not appear to increase consistently with age, unlike the situation for other dog breeds and humans.

Table 10

1. In most breeds of dogs and in humans, body weight tends to increase with age. This table shows the weight, height, and weight/height index by age separately for CKCS bitches and dogs. In both bitches and dogs, body weight tended to increase slightly with increasing age.
2. However, in the oldest of the old (for example, CKCS > 14 years of age) weight tended to increase slightly. The mean weights of CKCS bitches and dogs > 14 years of age were 16.6 lbs and 18.2 lbs, respectively.
3. Life-stage diets have become popular among the super premium brands of dry dog foods and these usually aim to reduce caloric intake and prevent obesity among older and typically less active canines. Such reduced calorie diets however, may be contraindicated in the very oldest dogs that may be losing muscle mass (sarcopenia) as is typical in

several species of animals including humans and other dog breeds we have surveyed. Owners of the oldest of the CKCSs (age >13-14 years) therefore, should discuss with a veterinarian the merit of switching to a higher protein and higher calorie dense food before the onset of weight loss. A puppy diet may be suitable for the geriatric dog as well.

Figures 6 & 7

1. An age-weight relationship was evaluated graphically for CKCS bitches and dogs.
2. An increase in weight was seen with advancing age in both bitches and dogs as indicated by the regression lines with upward slope in Figures 6 and 7, although the relationship was not statistically significant in dogs. This age-weight relationship is similar to that observed in other dog breeds such as Akitas and Wirehaired Pointing Griffons, where body weight increases significantly with increasing age.

Table 11

1. For a vast majority (75.3%) of the CKCSs, owners indicated they had tried to achieve an average rate of growth, versus a slow or maximum rate of growth.
2. Over 85% of the CKCSs in the survey were reported to be of average body condition as a puppy and as an adult. Seven percent of the bitches and about 10% of the dogs were underweight as puppies. However, only 0.9% of bitches and 0.5% of dogs were reported to be overweight as puppies versus 10.7% of adult bitches and 9.1% of adult dogs. Considering that currently about 35-30% of all adult dogs (like humans) are considered to be overweight or obese, the CKCS breed seems to be either more resistant to obesity or CKCS owners are more aware of the risk of obesity and are feeding accordingly. We suspect the former is the case.
3. As expected, more bitches than dogs were reported to be small boned while more dogs than bitches were large boned.

Tables 12 & 13

1. Among CKCS dogs, there was a consistent relationship between body condition (as puppy or as adult) and weight, height and weight/height index as an adult. There was also a consistent relationship between puppy body growth rate and height and weight/height index as an adult.
2. As would be expected there was a strong positive correlation between adult bone structure and reported weight, height and weight/height index of CKCS bitches and dogs. CKCSs reported to be large boned were heavier and taller than those reported to be medium or small boned. This suggests that there is no optimal weight for CKCSs in general. Instead, optimal adult weight should be determined based on bone structure and gender.

Table 14 and Figures 8 - 10

1. Most of the CKCS bitches (70.1%) and dogs (65.2 %) in this survey had been neutered at a mean age of 3.7 and 1.9 years, respectively. This relatively younger age at neutering when compared with other breeds of pet dogs, suggests that many CKCS were not used for breeding purposes.
2. It is widely recognized that neutered animals become heavier than intact animals, because neutering slows metabolism, decreases activity, and increases body fat. It is also known that older animals are heavier. Also, older dogs are more likely to be neutered than are younger dogs. In these figures, we attempted to differentiate the influence of age and gender on body weight from that of neuter status. In the CKCS, neutering appears to influence body weight of dogs and bitches, regardless of age. That is neutered females are heavier than intact females and neutered males are heavier than intact males, even after controlling for age.

Tables 15 & 16

1. Less than half (48.6%) of the CKCSs participating in the survey had been bred. A higher proportion of the bitches (59.5%) had been bred compared with only 31.4% of the CKCS dogs. Over 96% of the bitches that were bred had whelped at least once.
2. In all, 147 (42.5%) CKCS bitches in the survey had never whelped while the rest had whelped between 1-6 litters.

3. The mean age at first whelping was 2.8 years versus 7.9 years for a bitch's sixth litter.
4. The mean number of live puppies whelped per litter was approximately 4 and this varied between the first (3.7 pups) and the sixth (2.0 pups) litters. The mean number of stillborn pups per litter varied between 0.5 in the first and 0.3 in the sixth litters.
5. The median number of live born pups was 4 for the first through the 4 litter and then decreased to 3 and 2 for the fifth and sixth litter, respectively. This suggests that there are diminishing returns to breeding a bitch after its fourth litter. A similar pattern was seen when using the mean number of pups per litter. This pattern was not due however, to an increasing number of stillborn puppies with increasing litter order.

Table 17

1. Most bitches in this survey that whelped were bred naturally. The mean number of pups per litter resulting from natural breeding varied from a high of 4.4 in the second litter to a low of 2.0 in the sixth litter. Bitches bred artificially using fresh semen tended to have litters of comparable sizes. The numbers of bitches that had been bred using chilled or frozen semen were too small to make meaningful comparisons.
2. One cannot make any conclusions about natural vs. artificial methods of breeding based on such limited information. What we do not know from this survey is why artificial insemination was attempted in the first place. It is possible that owners selected some bitches for artificial breeding because they had prior reproductive problems or failed to breed naturally. If so, these selection factors need to be accounted for when comparing the outcomes of natural and artificial breeding.

Table 18

1. This table further explores the relationship between methods of insemination while ignoring litter order. For all 431 litters conceived naturally, the average size was 4.0 live born pups per litter of which 3.8 were raised to weaning age. The average number of live born pups per litter was lower for those bred artificially: fresh semen (3.8), chilled semen (2.8). These findings may support the use of fresh semen compared with chilled or frozen semen but it is important to note that age at breeding and litter order are not taken into account in this table.

2. The number of pups weaned as a percentage of those born is considered to be very good. In kennel situations one can expect that about 15-25% of pups born will not make it through weaning.
3. It is not possible to determine from this survey the actual conception rate resulting from different methods of breeding. Such information obtained retrospectively is probably not accurate.

Table 19

1. A majority of CKCSs participating in the survey had Blenheim coat color (58%), followed by tricolor (26.7%), ruby (8.5%) and black & tan (6.9%).

Tables 20 & 21

1. In our previous 5-year prospective study of bloat or GDV that included approximately 2000 dogs from 11 breeds that were followed for over five years, we developed a standardized scale (scores from 1 to 10, where 1 indicates never or low and 10 indicates always or high) to assess and compare the temperament and personality traits of dog breeds based on owner reports. This is the same scale we also used in previous breed health surveys and the current CKCS survey.
2. We thought therefore, it would be interesting to compare the findings for several breeds.
3. CKCSs were reported to be the least aggressive to other dogs and people compared with Irish Setters, Golden Retrievers and Akitas. They were also the least excitable as well as the most submissive to other dogs.
4. Keep in mind that all of the personality scores are means for the breed. There is however, great variability from dog to dog within breeds. No doubt there are some individual CKCSs that are just as trainable and excitable as a Golden Retriever, and just as submissive to people as an Akita.
5. These breed personality profiles may be very helpful to people when they are looking for a particular type of pet that fits their lifestyle.

Table 22

1. The overwhelming majority of adult CKCSs were fed dry food daily (86.9%) while 11.1% of owners reported never feeding dry food. In contrast, 17.3% of owners reported

feeding canned dog food, 29.5% reported feeding home prepared food, and 8.8%, table scraps on a daily basis. Compared with other breeds surveyed by us, the proportion of CKCSs being fed canned food daily is not high.

2. In general, the smaller the breed the less dry food and more canned and home prepared foods owners tend to feed. This may explain in part why smaller dog breeds are much more likely to develop gingivitis and periodontal disease than large or giant breeds.
3. A fairly high proportion of owners never fed their adult CKCSs home prepared foods (61%), or table scraps (79.5%). The feeding of table scraps however, is likely to be under reported by owners.

Table 23

1. Dry food was most likely to be fed twice (46.3% for adults) per day. Only 10 owners reported feeding their dog dry food 3 or 4 times per day.

Tables 24 & 25

1. The most commonly fed dry foods were the premium brands including Eukanuba (12.5%), Canidae (12.3%), Hill's Science Diet (12.3%), Nutro (6.4%), and Royal Canin (6.2%).
2. Among the canned foods, the most popular were Pedigree (30.2%), Tripett (11.2%), Science Diet (10.3%), Canidae (6.0%), and Iams (6.0%).

Table 26

1. Specific ingredients are listed on the labels for dry and canned pet foods in order of their weight, going from highest to lowest. The most common first ingredient in the dry foods fed to CKCSs was some type of white meat (45.9%) followed by some type of red meat (30.9%). Protein of plant origin was listed first only 19.5% of the time.
2. The most common first ingredient in the canned foods was some type of white meat (38.6%) followed by red meat (24.8%).

Table 27

1. The most commonly fed home prepared foods were white and red meats (38.4% and 28.0%, respectively) and vegetables (20.8%). Very few owners reported feeding fish,

despite the fact that fish is an excellent source of protein and fatty acids. In a recent study of Scottish Terriers, we found that dogs fed fresh vegetables at least 3 times per week have a lower risk of bladder cancer. This lower risk probably applies to other breeds and to other types of cancers (as in humans).

Table 28

1. Owners reported giving vitamins on a daily basis to 35.9% of the adult CKCSs. Cartilage/joint supplements and food supplements were given on a daily basis to 19.8% and 19.6%, respectively of the surveyed CKCSs.
2. There are no good long-term published studies in older dogs that we are aware of that demonstrate the health benefits of using either vitamins or cartilage supplements on a daily basis. However, evidence is mounting that this practice is beneficial in people, especially the use of anti-oxidants to prevent some types of cancer. In dogs, daily glucosamine use has been shown to reduce the severity of pain associated with hip dysplasia.
3. In humans and dogs, the most effective way to decrease the risk and severity of arthritis (hip dysplasia) and joint pain in general is weight loss.

Table 29

1. A small proportion (about 10%) of the adult CKCSs in this survey was reported by owners to be overweight. This is in sharp contrast to the approximately 25-30% of dogs of several other breeds and human adults that are overweight or obese.
2. In general, the type of foods fed was not associated with obesity in CKCSs. However, 14.0% of overweight CKCSs were fed table scraps daily compared with none of the underweight CKCSs and 8.4% of CKCSs with average body condition. Higher percentages of underweight CKCSs were fed home prepared foods (41.7%) compared with CKCSs with average (29.7%) or overweight (26.3%) body condition. This may reflect the fact that owners of CKCSs that suffer from some chronic health disorders that cause them to lose muscle mass, compensate by feeding with human foods.

Tables 30 & 31

1. There were no major differences in the weight by the type of food fed daily to CKCS bitches or dogs.
2. Among dogs, there is a suggestion that those not fed canned food daily were slightly heavier than those fed canned food daily (19.2 lbs versus 17.6 lbs). However, the increase in average weight may be due to the fact that these CKCS dogs fed canned dog food appear to be taller than those not fed canned food. Note that, the average weight/height index is identical in both groups of CKCSs. Moreover, these comparisons are based on a small number of CKCS dogs fed canned foods daily.
3. In general, height does not appear to be associated with food types fed daily.

Table 32

1. This table contains important information regarding preventive health practices for CKCS. While vaccination may cause a low rate of adverse health events (vaccine reactions), it is an effective method for reducing the frequency and severity of many infectious diseases of dogs. The benefits of vaccination clearly outweigh the risks.
2. All dogs in the U.S. are required by local or state law to be vaccinated against rabies, although the required frequency of vaccination varies from state to state (every 1, 2, or 3 years). This survey indicated that 4.1% of CKCSs were never vaccinated for rabies, 0.7% had been vaccinated only as a pup, and an additional 6.3% had been vaccinated sporadically. The recommendation is to give the first rabies vaccine at 3 months of age followed by a booster 1 year later. Thereafter, the frequency of vaccination will depend on state law and the type of vaccine used. There are currently rabies vaccines on the market that offer excellent immunity for 3 years. Therefore, no dog should ever go more than 3 years between rabies boosters. The consequences of having a dog unvaccinated for rabies are serious. For example, if an unvaccinated CKCS is bitten by a suspected or proven rabid animal, it must either be euthanized or kept in strict quarantine at a veterinary hospital or an approved facility for six months at the owner's expense. In contrast, if a vaccinated CKCS is bitten by a suspected rabid animal, it only needs to be revaccinated and can be observed at home for 45 days.

3. All dogs should be immunized against distemper and parvovirus as puppies, and then receive periodic booster immunizations. There is some controversy however in the veterinary community about how often such boosters are required. Some say that these vaccines produce lifetime immunity while others recommend yearly boosters. There is a growing trend towards giving boosters every 3 years rather than the more traditional yearly regimen, especially since several distemper/parvovirus vaccines with three year duration of immunity have recently been licensed for dogs.
4. About 45% of the CKCSs in this survey had never been vaccinated against leptospirosis and only about 30% had received a yearly vaccination. Many veterinarians do not recommend routine vaccination for leptospirosis, because they feel the disease occurs infrequently in the U.S. and that this vaccine may cause a slightly higher adverse reaction rate than other canine vaccines. However, the incidence of leptospirosis has increased dramatically over the past few years in the U.S. and is reported now to be the major cause of acute kidney failure in dogs. In addition, the types (serovars) of leptospirosis organisms that infect dogs today are different than they were 10 years ago. For this reason newer leptospirosis vaccines have been developed to protect against these new serovars. We recommend that all dogs be vaccinated against leptospirosis yearly regardless of breed or geographic location, and more frequent vaccination is suggested for high risk dogs such as those participating in hunting and water sports. The benefits of routine vaccination far outweigh the risks of adverse events that occur infrequently with the newer vaccines. Remember that leptospirosis is shed in the urine of an infected dog and can be infectious for other dogs as well as humans.
5. Routine Lyme disease vaccine is only indicated for dogs that live in endemic areas such as the northeastern U.S. and Michigan and dogs that travel to such areas. Your veterinarian can provide you with a list of states or geographic areas where Lyme disease is endemic.
6. Only 41.2% of the CKCSs were vaccinated yearly against kennel cough. The intranasal kennel cough vaccines are very effective and are highly recommended for dogs attending shows or boarding. The parenteral (injectable) kennel cough vaccines are less effective in these situations because they take longer before they provide protection than do the intranasal vaccines.

7. Nearly half of all CKCSs had never been vaccinated against coronavirus. Many veterinarians believe that coronavirus is not an important cause of gastrointestinal disease of dogs and therefore, do not recommend routine vaccination. However, it may be indicated in boarding dogs, especially if there has been a problem with coronavirus in the community.
8. In general, fewer CKCSs than dogs of some other breeds we have studied had never been vaccinated against diseases such as rabies, had been vaccinated as a puppy only, or had been vaccinated only sporadically. This probably indicates that CKCS owners are more aware of preventive health practices than owners of other breeds of dogs and more conscientious.

Table 33

1. Most worming medications had not been administered on a regular basis. However, worming medications had been given based on positive fecal tests (45.6%). Yearly deworming is considered good preventive medicine regardless of age, but only 16% of the CKCSs had been dewormed yearly. Over one-fifth of the CKCSs in this survey had never been given any worming medications.

Tables 34 & 35

1. Nearly four-fifths of the CKCSs had received heartworm prevention routinely. Monthly oral administration was the most common method used; nearly half of the CKCSs in the study had received monthly heartworm medications. A heartworm preventive called ProHeart 6 was available until recently that needed to be administered by injection every 6 months and 1.5% of the owners reported using it. It is unfortunate that ProHeart 6 was taken off the market because the greatest reason why monthly heartworm preventives fail and result in heartworm infection is lack of owner compliance. We recently published the results of a study on the efficacy of heartworm preventives in over two million dogs and found that ProHeart 6 was as safe as or safer than two monthly heartworm preventives including Heartgard. In addition, ProHeart 6 continues to be used by dog owners in many countries in the world and in Australia ProHeart is three times as strong as the ProHeart used in the U.S. and provides protection for at least 12 months. About one-fifth of the CKCSs in this study never received any heartworm preventive and they tended to

live in areas where heartworm infection is less common. However, these dogs may still travel with their owners to heartworm endemic areas.

2. California and Washington were the states of residence for about 20% of the CKCSs in the survey. About 55% of the CKCSs that never received heartworm preventatives lived in one of these states.
3. Owners of a few CKCSs wrote in that they continue to use daily heartworm preventive drugs. Use of such heartworm preventives are discouraged by veterinarians, because if owners miss even one day of administration the dog will become susceptible to heartworm infection. This is also why ProHeart 6 should be more effective than even the monthly heartworm preventives. As with any drug for veterinary or human use, the most common reason for drug inefficacy is administration non-compliance.

Table 36

1. Exposure to flea dips has been associated with an increased risk of bladder cancer in certain breeds of dogs. The survey results show that about 10% of CKCSs have some exposure to flea and tick dips, with most exposure being sporadic. Use of flea and tick dips should be minimized and replaced by either sprays for immediate kill or by the newer spot-on products.
2. Exposure to flea and tick products as either drops applied to the skin (spot-ons) or as shampoos or sprays is more common. A recent study recommended spot-ons as safe and effective alternatives to the older topical products, because they were not associated with an increased risk of bladder cancer in dogs.

Table 37

1. Questions were included in the survey at the club's request about the frequency of exposure of CKCSs to different types of water. Few CKCS owners reported taking their dogs swimming, but when they did, it was sporadic and usually in fresh rather than in salt water.

Table 38

1. Questions were included in the survey about the frequency of exposure of CKCSs to lawn chemicals. Previous studies have indicated an increased risk of lymphoma in dogs

exposed to lawn chemicals and an increased risk of bladder cancer in Scottish Terriers exposed to lawn chemicals.

2. This table shows that about 43% of all CKCSs have had some exposure to lawn chemicals with sporadic exposure being the most common (26.9%). However, about one-fifth of the CKCSs lived in households where chemicals were applied to yards seasonally.
3. Only about 8% of CKCSs walked through areas treated with chemicals. Exposure to treated lawns when it occurred was typically within 12 hours of application which increases the risk of absorption.
4. The earliest sign of bladder cancer in dogs is usually blood in the urine.

Table 39

1. This rather long table describes the frequency of veterinary-confirmed health disorders by type and by body system involved. In addition, for each category of disorder and for specific disorders, it shows the proportion of all CKCSs that were affected.
2. In comparison with other breeds, neoplasms (cancers) are relatively uncommon in the CKCS breed. The most common malignant neoplasm in the CKCS was adenocarcinoma, lymphoma and squamous cell carcinoma (13% of all cancers each). Overall, 4.1% of CKCSs in the survey were reported to have ever developed cancer. Keep in mind however, that the dogs in this survey were relatively young and cancer is much more common in older dogs.
3. The most commonly reported site for cancer was the mammary gland (26.1%) and adenocarcinoma was the most common type of cancer affecting the mammary gland.
4. Non-malignant (benign) neoplasms most often consisted of lipomas or papillomas. These tumors are not life-threatening and can be surgically cured. However, many times they are not treated when small in size.
5. Cardiovascular (heart and circulation) disorders affected 44.4% of CKCSs. Heart murmur and mitral valve disease were the most common diagnosis. A heart murmur is not a specific disease per se, but rather reflects some underlying condition such as a valve dysfunction, cardiomyopathy, etc. It is very common particularly in smaller breeds. Pulmonic valvular stenosis is thought to be a genetic problem in some breeds, but was

reported for only one CKCS. None of the CKCSs were reported to have had subaortic stenosis, which also is inherited. Both these heritable diseases are more common in some large and giant breed dogs. In a previous study of 79 CKCSs with an average age of 7.6 years, 59 had cardiac murmurs and the intensity of the murmur was correlated with the intensity of the underlying cardiovascular disease. Researchers have concluded that the status of the sire and dam with respect to their underlying heart disease is an important factor influencing the probability and intensity of heart murmurs in their offspring. In another study the prevalence of chronic valvular disease was 13.2% among 494 CKCSs with an average age of 3.0 years. In contrast, the prevalence was 52% among CKCSs with an average age of 6.4 years. The bottom line of these and other studies including the present health survey is that heart disease appears to be the major health problem of CKCSs. While much research has been focused on the treatment of heart disease in dogs, the best way to reduce the prevalence in CKCSs is to identify both the environmental and genetic causes of this disease. An important question is what is the role of diet and could vitamins or other nutritional supplements prevent progression of the problem. Ultimately prevention is best approached by identifying the gene or genes responsible and through selective breeding.

6. About 15% of CKCSs had been diagnosed with an allergy. Allergic dermatitis due to fleas was most commonly reported. Allergies are more common in younger dogs.
7. Less than 3% of the CKCSs were diagnosed with an endocrine disorders and the most common was hypothyroidism (50% of all endocrine conditions). Compared with other breeds such as the Golden Retriever and the Irish Setter, the proportion of dogs diagnosed with hypothyroidism was small. Hypothyroidism has become epidemic in many dog breeds in recent years, but the cause is not known. Repeated vaccination has been suggested by some veterinarians as a cause for the increased prevalence of hypothyroidism, but this has not been supported by some experimental studies. It is interesting to note that in contrast to hypothyroidism in dogs, there is currently an epidemic of hyperthyroidism in cats that has been linked to chemicals found in the linings for food cans.

8. Just over 10% of all CKCSs had been diagnosed with a gastrointestinal disorder with gastritis, colitis, and diarrhea, the most common. In contrast, having a foreign body in the stomach or intestine was reported to have occurred in only 4 (0.7%) of all CKCSs.
9. Hematologic or blood disorders were reported for <3% of all CKCSs.
10. Urinary tract/renal disorders were reported for about 7% of all CKCSs, with bladder infections accounting for over half (51.9 %) of such problems. Urinary incontinence has been reported to occur more frequently in middle-aged bitches of many different breeds. Some suspect that neutered bitches, especially those neutered at a young age, are at increased risk for urinary incontinence. While urinary incontinence is not life threatening, drug therapy is often not completely effective. However, only about 1% of CKCSs were reported with this disorder.
11. Neurological disorders were reported for 9.2% of CKCSs. Nearly 4% of CKCSs were diagnosed with syringomyelia which is considered extremely high compared with other dog breeds. Studies have shown that the incidence of syringomyelia was very high in certain families and lines of CKCSs which had been extensively inbred. In one study of 1300 CKCSs spanning 20 generations, 45 dogs with syringomyelia were identified and traced back to one bitch born in 1956 and the two offspring from her single litter. The condition was thought to be an autosomal recessive trait because both dam and sire must be inbred descendants from certain lines. In the current survey syringomyelia was listed high among CKCS owner concerns.

    Seizures of unknown origin (epilepsy) were reported to occur in 3% of CKCSs. In published studies seizures were more frequent in lines of CKCSs that originated from whole-color dogs and the authors concluded that both epilepsy and syringomyelia were in part due to selection of coat color. They further suggested that breeding guidelines to reduce the incidence of mitral valve disease have placed further pressures on the gene pool and increased the incidence of both epilepsy and syringomyelia.
12. Nearly one-fifth (18.2 %) of CKCSs were affected by some form of musculoskeletal disorder with patella luxation being the most common. It is likely that many CKCSs with hip dysplasia also have some arthritis. This condition is much more common in large breeds and prevention is based on selective breeding using radiographic evaluation of the

hips as a guide. Weight control is also important for the prevention of progression of hip dysplasia.

13. Nearly one-third (27.2%) of CKCSs had been diagnosed with an eye disorder with cataracts most commonly reported (6% of CKCSs). It is likely however, that some of the CKCSs reported to have cataracts had nuclear sclerosis instead, a clouding of the cornea associated with older age. Two CKCSs were reported to have had progressive retinal atrophy, an inherited eye disorder.
14. Chronic or intermittent ear infections were reported for 6.5% of the CKCSs. In general, ear problems are much more common in breeds with floppy ears. However, the frequency of ear infections in CKCSs was significantly less common than in Irish Setters and Golden Retrievers.
15. A wide variety of reproductive problems were reported for both bitches and dogs. However while one-fourth of all bitches in the survey were reported to have had some reproductive problem, only 10% of dogs were reported to have had a reproductive problem. Forty one percent of all female reproductive problems were described as a caesarian surgical procedure.
16. Disorders of the skin and coat affected 12.2% of all CKCSs in the study. Among these problems, the most frequent was sebaceous cysts (32.6%) followed by hot spots (31.4%). Hot spots plague many breeds of dogs such as the Golden Retriever but only 4.8% of CKCSs had had a hot spot. It is not know what causes this condition which arises suddenly, usually in warmer weather. However in other breed surveys, we found an association between the occurrence of hot spots and exposure to lawns treated with herbicides.
17. About 8% of the CKCSs in the survey were reported to have experienced trauma or an accident. Lameness requiring treatment accounted for nearly 40% of all trauma incidents.
18. Bacterial infections included the diagnoses of cystitis and Lyme disease. Owners should consider vaccinating for Lyme disease if they live in an endemic area. The new recombinant Lyme vaccine is thought to be effective and much safer than the previously available killed vaccine. The only reported viral infection was tracheobronchitis or

kennel cough. Kennel cough is caused by Bordatella bronchiseptica, but viruses have also been implicated. Fungal infections were uncommon.

19. Parasitic infestations were reported for about a quarter of all CKCSs (24.9%), with ear mites, fleas and giardia, being the most common. Most of the intestinal parasite infections involved younger animals (see later tables).
20. The prevalence of nose and mouth problems was nearly 30% with gum problems such as gingivitis being the most common. Feeding of dry foods is usually associated with a lower incidence of dental problems. For this reason, periodontal disease occurs more frequently in smaller dogs that are more likely to be fed canned and other non-dry foods.
21. Behavior problems were reported for relatively few CKCSs (4.2%) and the most frequently encountered behavior problem was separation anxiety.
22. Birth defects or congenital problems were reported for 14.3% of CKCSs, with umbilical hernia the most common. Congenital problems (meaning present at birth) may either be inherited or the result of exposure of the pregnant bitch to a toxic chemical or drug.
23. Anal sacculitis was reported for 11.7% of the CKCSs surveyed. The cause of this condition is unknown and there is no effective treatment. It can become a nuisance for both owner and dog.

Table 40

1. Questions on mitral valve disease (MVD) were included in the survey at the request of the breed club. MVD was reported to have been confirmed in 192 (34%) of CKCSs. Note however, that in the previous table only 153 owners responded 'yes' when asked if MVD had been confirmed by a veterinarian.
2. Over half (59.4%) of the 192 cases of MVD had been confirmed by ultrasound/color doppler.
3. Eleven (5.7%) of the 192 cases of MVD in this table were considered "cleared" of signs at a later date.
4. Enalapril and furosemide were the drugs most commonly used in the 192 CKCSs with MVD. Mean (SD) age at which medication for MVD was started was 7.7 (± 2.4) years.

Table 41

1. Thirty five (6.2%) CKCSs were reported to have had hearing problems. BAER testing was used in 40% of the 35 CKCSs with hearing problems. The mean age at which hearing loss became a serious problem was 6.9 years. The mean age at which CKCSs became totally deaf was 7.5 years. It is often difficult to document hearing loss in dogs without conducting specific tests. Genetic studies are recommended to determine if hearing loss is inherited and the mode of inheritance.

Table 42

1. The CKCSs that were reported to have had Lyme disease lived in states that are considered endemic. Endemic Lyme areas in the U.S. include the Northeast, upper Midwest, and California. Several types of Lyme vaccines are available for dogs and are recommended yearly for dogs living in or traveling to Lyme endemic areas.

Table 43

1. Only 0.7% of CKCSs in the survey were reported by owners to have been involved in auto accidents which reflect good management and owner supervision. This percentage is the lowest among the seven breeds we studied previously.
2. About 9% of the CKCSs were hospitalized for some type of health condition at least once.

Table 44 (See previous discussion on syringomyelia (Table 41, point 11))

1. Forty eight (8.5%) CKCSs were suspected of having syringomyelia (SM) or Chairi 1 Malformation. Nineteen (3.4%) were reported to have first degree relatives with SM.
2. Less than half (46.9%) of dogs suspected of having SM had been diagnosed by a veterinarian.

Table 45

1. Over one-fourth (26.1%) of the 23 CKCSs with confirmed SM first showed signs at 3-4 years of age.
2. About 44% were first diagnosed with SM at 4-6 years of age.
3. Diagnosis was based on MRI over half (56.5%) of the time.

4. Surgery was performed in 6 (26.1%) of the CKCSs with SM.
5. The most common initial clinical signs of SM were shoulder scratching (65.2%), neck pain (56.5%), screaming for no apparent reason (39.1%), and screaming when touched (26.1%).
6. The most common current clinical signs of SM were shoulder scratching (65.2%), neck pain (43.5%), scratching elsewhere (other than shoulder--34.8%), screaming when touched (26.1%), wobbly hind limb gait (26.1%), and weak forelimbs (26.1%).
7. One CKCS was euthanized due to syringomyelia.

Table 46

1. Thirty five (6.2%) of CKCSs were reported to have experienced an acute adverse vaccine- or drug-associated reaction. Nineteen (54.3 %) of these reactions were confirmed by a veterinarian.
2. CKCSs of all ages experienced an adverse drug reaction; however, the younger ones were predisposed.
3. Over one-third (34.3%) of the 35 CKCSs experienced adverse reactions to vaccines. In a Purdue study of over 1 million vaccinated dogs, the incidence of an allergic reaction was about 0.35% and more than 95% of such reactions occurred within the first 96 hours. The probability of an adverse event following vaccination increased with decreasing body weight and an increasing number of vaccines given concurrently. The vaccine most likely to produce an adverse reaction was Lyme. Allergic reactions following vaccination are almost never life threatening and usually require no treatment.

Tables 47 & 48

1. These tables show the age at first occurrence for the most common health problems in CKCSs. Cancer and cardiovascular diseases generally affect older animals while endocrine and musculoskeletal disorders generally had clinical onset in middle age animals. Parasitic infections developed primarily in younger CKCSs.

Table 49

1. This table is similar to previous tables in that it describes the frequency of different health-related disorders by age. However, the method used to calculate the frequency is

very different. In previous tables disease frequency was based on the number of incidents or individuals affected and expressed as a proportion (%). This type of measurement however, does not indicate the probability or risk that an individual CKCS will develop a specific condition in a given period of time or over a lifetime. In contrast, in this table, the frequency of disease is expressed as the incidence rate per 1000 dog years at risk for specific age groups. (One dog year at risk represents one dog in a specific age group living for one year or two dogs living for six months each, etc.). The frequency is expressed in this manner because CKCSs were of different ages at the start of the health survey. As a result, individual CKCSs were observed for very different lengths of time when the survey period ended.

2. For cardiovascular disorders the incidence tended to rise with age while the incidence of ear infections tended to decrease with age.

Table 50

1. This table describes the number of CKCSs that were treated for different health disorders and the proportion of those treated that were cured. For example, 2 (66.7%) of the 3 CKCSs diagnosed with adenocarcinoma were treated, and of these, 1 (50.0%) was cured. In contrast, all 3 (100%) of the CKCSs with lymphoma were treated and of these 1 (33.3%) was cured.
2. What do these numbers tell us? First, the proportion treated usually is indicative of the treatments available and the prognosis at the time of treatment. For example, heart murmurs are usually not treated when first diagnosed. Second, the proportion cured is indicative of the efficacy of currently available treatments. For example, many cases of congestive heart failure are advanced at the time of diagnosis. Drug therapy at this point may help alleviate clinical signs, but are rarely curative. For diseases with low cure rates, the emphasis should be placed on prevention research.
3. Very few of the CKCSs with MVD, cardiomyopathy, or heart failure, were reported to have been cured following treatment. The goal of treatment is palliative and aimed at improving quality of life. The same can be said for other health problems such as epilepsy, hypothyroidism, colitis, urinary incontinence, arthritis, and autoimmune

disorders. Ear diseases can be successfully treated, but often recur. The more chronic the ear infection, the less effective is drug therapy.

4. Breed clubs trying to prioritize research for their breed can use the information in this table. For example, one must decide if it is better to conduct research aimed at developing better treatments or at identifying risk factors for disease that can be used to design preventive strategies.

Table 51

1. Behavioral problems requiring treatment were reported for 24 (<5%) of CKCSs. The most common approach to treatment was professional counseling or behavior modification. The efficacy of drug treatment for behavioral problems in dogs is for the most part uncertain.

Tables 52-58

In these tables we try to identify possible risk (associated) factors for specific health disorders in CKCSs. A risk factor is defined as a characteristic of the host, the environment, or management that is associated with an increased risk of disease. An association is deemed to be statistically significant if the relationship between the risk factor and disease occurred by chance less than 5% of the time (i.e., the P-value is <0.05). However, even when the P-value is slightly >5%, the observed relationship is worth examining further.

Tables 52 & 53

1. CKCSs with urinary incontinence were more likely to be bitches than dogs although this relationship was not statistically significant. However, many other studies have shown that bitches are at greater risk of urinary incontinence than are dogs. Bitches were significantly more likely to be diagnosed with bladder infection than dogs, as has been shown previously. However, dogs were more likely to be diagnosed with heart murmurs, but again this relationship was not statistically significant. No relationship with gender was observed for MVD.
2. In previous breed surveys we found that bitches with urinary incontinence were significantly more likely to have been spayed than were bitches without urinary

incontinence. Although this relationship appeared to hold true for the CKCSs as well, it was not statistically significant, perhaps due to the small number of cases of urinary incontinence. Neutering in females has previously been associated with urinary incontinence.

Tables 54 & 55

1. No association was found between body condition (both as puppy and as adult) and heart murmur or MVD.
2. Results from surveys of Akitas, Airedale Terriers, and Golden Retrievers, indicated that dogs with musculoskeletal diseases such as hip dysplasia were more likely to be overweight and less likely to be underweight as a puppy or as an adult than dogs without musculoskeletal disease. In CKCS, adult body condition was associated with musculoskeletal disorders. Significantly more overweight CKCSs as adults developed a musculoskeletal disorder.
3. Increasing adult weight in both bitches and dogs was associated with musculoskeletal disorders, but this relationship was not statistically significant. Nevertheless, weight control in adult CKCSs is important for optimum health.

Table 56

1. No association was found between coat color and several important health disorders we evaluated.

Table 57

1. A positive association was found between CKCSs suspected to have syringomyelia (SM) and a history of SM in any first degree relative. Although a similar association was found between CKCSs with confirmed SM, the relationship was not statistically significant. This may reflect the smaller number of CKCSs with confirmed (22) compared with suspected (47) SM.

Table 58

1. No association was found between ear infections and hearing problems.

Table 59

1. Daily consumption of diet supplements was positively associated with diagnosis of any heart disease. However, this relationship was not statistically significant. It may be that CKCSs with heart disease were give daily dietary supplements after the diagnosis was made.
2. Although there was a similar association of daily diet supplements with heart murmur, MVD, and syringomyelia, none were statistically significant.

Tables 60 - 62 and Figures 11 - 16

1. The most important cause of death for CKCSs was heart failure (47.7% of all 88 deaths reported in the survey; 54.4% of the 68 deaths that were veterinarian-confirmed). This was followed by deaths due to cancer, kidney failure, "old age" and neurological disorders. The term "old age" suggests an older dog that died for no known reason. Collectively, these 5 causes accounted for over 90% of all confirmed deaths in CKCSs.
2. The five leading causes of death were different in bitches and dogs. For example, no bitches were confirmed to have died from kidney failure.
3. Deaths due to kidney failure and old age occurred as expected primarily in older CKCSs. However, deaths due to heart failure and cancer occurred in both middle-aged and older CKCS bitches and dogs.

Figure 17

1. As heart disease and cancer were a major cause of death, we calculated the proportion of all diagnoses attributed to these two diseases in each age group.
2. About 35% of all deaths in CKCSs aged 5-6.9 years and 7-8.9 years were attributed to heart disease. One-fourth of all deaths in the 9+ age-group were from heart disease.
3. Even in the oldest group of CKCSs, cancer comprised only 5% of all deaths, a very small proportion compared with humans and other dog breeds.

Table 63

1. In previous health surveys, cancer was the leading cause of death in breeds such as the Irish Setters, Golden Retrievers, and the Akitas. In humans cancer is the third leading cause of death after heart disease and stroke. The smaller proportion of CKCSs that die

of cancer compared with humans probably reflects the fact that humans are more likely to have risk factors for cancer such as smoking, obesity, and exposure to chemicals in the work place.

Table 64 & Figure 18

1. The death rate for CKCS dogs and bitches was similar in most age groups. However, the death rate for bitches' ages 5 – 6.9 years, ages 7 – 8.9 years and ages 9+ years, was higher than the comparable death rate for dogs. In contrast, for all other dog breeds previously studied and humans, males generally die off at a faster rate than females.

Table 65 & Figure 19

1. Death rates by cause did not vary substantially between CKCS bitches and dogs. Cancer, kidney failure, neurological disease, and trauma, death rates were somewhat higher for dogs than bitches while death rates for heart failure, old age, gastrointestinal disease, and autoimmune disease, were higher for bitches.
2. Most other veterinary studies simply look at all deaths in a breed and then determine the proportion of deaths from different causes. This approach can be very misleading, since a reduction in one cause of death necessarily results in a higher percentage for the other causes (total = 100%), even if these other cause do not change in frequency. This is why rates are a much better way to evaluate the risk of death due to different causes

Table 66

1. Rates for the three most common causes of death increased steadily with increasing age in both bitches and dogs. Heart failure stands out as the leading cause of death for both bitches and dogs.

Table 67

1. The average age at death for all CKCSs whose cause of death was confirmed by a veterinarian was 10.4 years. This was only slightly less than the average age (10.7 years) for all deaths, regardless of whether the cause of death had been confirmed by a veterinarian or not.

2. The disorders associated with early deaths were neurological, gastrointestinal, trauma, and autoimmune disorders.
3. The average age at death for "old age" was 14.6 years. It is likely that these CKCSs died from multiple system failure such that no one specific cause of death could be identified.
4. The effectiveness of a prevention program for a specific disease can be evaluated in terms of either the incidence rate of that disease (a lower rate is better) or the age at death (an older age is better).

Table 68

1. An attempt was made to determine if a relationship existed between where an individual CKCS was obtained and its life expectancy. The average age at death was greatest for bitches (11.0 years) that were obtained from a breeder-kennel and for dogs (12.3 years) that were bred in owner's own kennel or house. However, there were too few CKCSs obtained from a shelter, pet store or through rescue efforts, to draw a meaningful conclusion about what effect this has on longevity.

Figures 20 & 21

1. There is very little information available in the literature concerning the relationship between the age at death of an individual dog and the age at death of his or her parents. Such information in humans suggests that parental age at death (i.e., genetics) is a strong determinant of longevity for an individual. We used the survey data to study this relationship in CKCSs and compare it with similar analyses in Irish Setters, Airedale Terriers, and Akitas.
2. There was a negative relationship between age at death in CKCSs and the age at death of the dam or the sire. However, both relationships were not statistically significant. In contrast, positive significant relationships were observed between age at death of individual dogs and the age at death of his or her parents.
3. Until other breeds are evaluated, it is not possible to know if the pattern observed in the other breeds is the norm or if the pattern observed in the CKCS is the norm.

Tables 69 & 70

1. In these tables we show the lifetime risk for a CKCS developing a specific condition and compare this lifetime risk to that for other dog breeds, namely the Irish Setter, Golden Retriever, Akita, and Airedale Terrier. This analysis is based on the 82 CKCSs that had already died at the time the survey was conducted. This ensured that we had a complete lifetime picture of health-related disorders for these CKCSs. To our knowledge, information on the lifetime risk for medical conditions in not available for many other breeds.
2. The highest lifetime risk (about 82% or 1 in 1.2) was observed for any cardiovascular disorder while the next highest lifetime risk (1 in 3 or 33%) was observed for any ocular, nasal, or oral problem. The specific diseases with the highest lifetime risk were mitral valve disease (1 in 2) and heart murmur (1 in 2). This indicates that further research is needed on the possible risk factors for heart disease in CKCSs. In general, the lifetime risk of cardiovascular disease was much higher in the CKCSs than for most other breeds and even humans.
3. In humans, the major risk factors for heart disease are hypertension, obesity, smoking, and increased cholesterol levels. These risk factors are generally absent for the CKCS or else occur in lower frequency. It is more likely therefore, that genetics plays a greater role in development of heart disease in CKCSs that it does in humans. However, there are probably still some environmental risk factors for heart disease in CKCSs that should be identified, such as diet. Knowledge of risk factors for CKCSs would allow risk reduction interventions to reduce the risk of heart disease even before responsible genes can be identified. Therefore, environmental risk factor studies should receive high priority in this breed.
4. The 1 in 6 lifetime risk of developing cancer in CKCSs was much lower than that for Golden Retrievers, Irish Setters and Airedale Terriers, and slightly lower than that for Akitas.
5. The lifetime risk of developing any endocrine, gastrointestinal, musculoskeletal, skin, reproductive disorders, bacterial, parasitic infections and trauma/accidents, in CKCSs was lower than for other breeds. In contrast, the lifetime risk of developing conditions

such as any eye, nose & mouth, behavioral, congenital abnormality, or anal sacculitis, was generally higher than for other dog breeds.

Figures 22 & 23

1. These figures represent a family of survival or actuarial curves. They provide information on how long CKCSs of different gender and ages as of January 1, 2001 are expected to live. For example, of the CKCSs that were 9+ years of age at the start of the study, approximately 20% died by the end of the first year of follow-up and >25% were dead within 2 years. In contrast, of the CKCSs that were only 4-4.9 years of age in January 1, 2001, < 5% died during the first two years of follow-up.
2. Survival curves are used in the human life insurance industry to determine premiums for based on a person's current age. They could be used by owners and veterinarians to predict how long an individual animal is expected to live or for determining premiums for pet health insurance. Actuarial curves would be very interesting to compare between different size dogs or between dogs on different diets.

Table 71

1. Owners were asked to rank what they thought were the three most important diseases of concern to them in CKCSs. They responded with heart disease, syringomyelia, and cancer. This is consistent with the finding that heart failure and cancer were two leading causes of mortality (death) in CKCSs. Mitral valve disease and heart murmur affected 1 in every 2 CKCSs during their lifetime. In contrast, gingivitis which affects 1 in 3 CKCSs during their lifetime and is very common in most small dogs did not appear to be of major concern, probably because they are readily prevented with yearly dental prophylaxis.
2. These findings raise the question of what constitutes an important health concern to CKCS owners. If a disease such as cancer is very common and is associated with high mortality, it is likely to be of great concern. However, even diseases that are not fatal may be considered important to some owners if they are fairly common and not readily curable with treatment, such as epilepsy, hypothyroidism, and behavior problems.

IV Final comments

Compared with other breeds we have studied, the state of health of CKCS appears to be fairly robust. The average age of death in this study was 10.7 years and no single disease seemed to cause death at an exceptionally early age. However, cardiovascular disorders, especially mitral valve disease, affected over 80% of the CKCSs. Eye, ear and nose & mouth, disorders also affected a relatively high proportion of CKCSs. Musculoskeletal, gastrointestinal, endocrine, and reproductive disorders, however were relatively uncommon. Syringomyelia, a concern among owners, affected about 4% of the CKCSs.

Neutering was shown to substantially increase the risk of urinary incontinence in bitches. While urinary incontinence is not life threatening, it is frustrating to treat and a nuisance. Also, the frequency of urinary incontinence may increase over time as more veterinarians adopt the practice of neutering dogs before 16 weeks of age. Therefore, we need to learn more about how age at neutering influences the risk and severity of urinary incontinence and whether routine exogenous hormone supplementation following neutering is indicated.

Based on results of this health survey of the CKCS breed, the following recommendations or questions should be addressed.

1. Studies should be conducted to describe the natural history of mitral valve insufficiency. The questions that should be answered are:
    a. How early can mitral valve dysfunction be detected and what is its prevalence?
    b. What is the mode of inheritance of mitral valve disease?
    c. What are the host, environmental, and dietary risk factors for mitral valve disease and are risk factor interventions possible to decrease either its prevalence or severity (e.g. specific nutritional supplements)?
    d. Are there specific genes that increase susceptibility to mitral valve disease?
2. How effective is once or twice yearly dental prophylaxis for prevention of periodontal disease? Are there specific diets that are effective in reducing the severity of periodontal

disease and gingivitis? Is periodontal disease associated with early onset or severity of mitral valve disease, since both are inflammatory in nature and may be associated with bacterial infection? If mitral valve disease and periodontal disease are associated, does dental prophylaxis or prophylactic use of antibiotics reduce the prevalence of mitral valve disease in CKCSs?

3. Genetic studies of syringomyelia are needed to determine the mode of inheritance and to identify specific genes. The information from such studies can be used for selective breeding. In addition, it should be determined whether there are any in utero factors that increase the risk of syringomyelia such as exposure of the dam to environmental factors or use of specific drugs. It should also be determined whether vitamin or mineral supplements given to dams are effective in reducing the risk of syringomyelia in their offspring, much like folic acid supplementation when given to pregnant women significantly decreases the risk of spinal bifida.

We hope the information contained in this first-ever health survey of CKCSs will lead to a better appreciation of this wonderful breed by veterinarians and pet owners. It can be very useful to prospective owners and to the ACKCSC Charitable Trust in developing strategies for further improving the health and well-being of the CKCS breed.

Appendix I

Cavalier King Charles Spaniel Health Survey

A Collaborative Effort of the ACKCSC Health Committee, Board of Directors and Members of the ACKCSC, Inc., and The Purdue University School of Veterinary Medicine, Section of Clinical Epidemiology (Dr. Larry Glickman, Head)

The American Cavalier King Charles Spaniel Club, Inc. (ACKCSC) and the Purdue University School of Veterinary Medicine would like your participation in a survey to identify the frequency of health related conditions of Cavalier King Charles Spaniel dogs. This information will be useful in prioritizing health research resources and will provide a baseline against which to measure the impact of future breeding and health promotion programs. All information collected will be tabulated by Dr. Glickman and his staff at Purdue University and a report of the findings submitted to the ACKCSC for distribution to its members. All responses will be kept confidential, i.e., the names of the respondents will be kept anonymous and separate from the responses. The study is funded by the American Cavalier King Charles Spaniel Club, Inc. Its success and accuracy depends on a high rate of cooperation.

Please take the time to complete **one questionnaire for each eligible dog** and return it promptly to:

Cavalier King Charles Spaniel 2004 Health Survey
c/o Dr. Larry Glickman
Purdue University School of Veterinary Medicine
725 Harrison Street
West Lafayette, IN 47907-2027

Please feel free to make copies of this survey as needed. Additional copies may also be downloaded from the American Cavalier King Charles Spaniel Club's web page at http://ACKCSC.org or by contacting the Health Committee Chairperson, Joanne Nash at jnash@telis.org

The deadline for responses is February 1, 2005 after which time your questionnaire will not be included.

Thanks for your participation in this most important study. If you have any questions concerning this survey, please send an email to one of the following:

ACKCSC Health Committee, Chair – Joanne Nash – jnash@telis.org
ACKCSC Health Committee/Survey – Patti Conroy – pconroy@nycap.rr.com

or call telephone number (518)783-6310 and a Health Committee member will call you back.

Selecting Dogs for Entry into the 2004 ACKCSC Health Survey

Each applicant may enter up to 5 dogs in this survey. Eligible dogs are those which were alive on **January 1, 2001** and for which you know their life history. These dogs can either be alive now or have died since January 1, 2001. If you owned more than 5 dogs on January 1, 2001, arrange them according to the month of birth and select the first 5 for inclusion (i.e., first the dogs born in January, then ones born in February, then March or until you reach a total of 5 dogs). Please complete a separate survey form for each of the dogs entered.

I. General Owner Information

1. How many Cavalier King Charles Spaniels were living with you on Jan. 1, 2001? _____
2. How many Cavalier King Charles Spaniels are currently living with you: _____
3. How many years have you been in the breed: _____
4. What are your primary interests: (Check all that apply)

__ Breeder __ Show __ Obedience __ Agility __ Therapy

__Companion/Pet __ Rescue __Other (specify)_____

5. What three diseases or health-related conditions do you feel are of the most concern for Cavalier King Charles Spaniels? Write **one number** that corresponds to the respective disease from the table below on each of the following three lines: (a)=highest concern. List in order of importance from highest to lowest.

(a) _____ (b) _____ (c) _____

(1)	Cancer (neoplasia)	(9)	Allergies
(2)	Elbow/hip dysplasia	(10)	Autoimmune diseases
(3)	Digestive tract diseases	(11)	Reproductive problems
(4)	Heart disease	(12)	Behavior/temperament problems
(5)	Thyroid diseases	(13)	Syringomyelia
(6)	Epilepsy/seizures	(14)	Kidney disease
(7)	Eye diseases	(15)	Neurologic diseases
(8)	Skin/coat diseases	(16)	Other, specify _____

Please fill out a <u>separate form</u> for *each* dog

II. General Dog Information

1. Date of birth: _____month _____day _____year
2. What coat color is your Cavalier? (Please check)

   ☐ Black & Tan ☐ Ruby ☐ Tri-Color ☐ Blenheim
3. Sex: ____Male ____Female
4. Neutered ____Yes ____No

   If neutered, date of surgery: _____month _____year
5. Was your dog ever bred? _____Yes _____No
6. For bitches only, has this dog ever had a litter: _____Yes _____No

If Yes, please complete following table:

Litter #	Month/Year	# Live Born	# Still Born	# Weaned	Type of Breeding (use code below)
#1					
#2					
#3					
#4					
#5					
#6					

For Type of Breeding, please use the following code:

1 *= natural* ***2*** *= artificial insemination-fresh semen*

3 *= artificial insemination-chilled semen* ***4*** *= artificial insemination-frozen semen*

7. Where did you obtain this dog: __bred yourself __breeder (kennel)

__ breeder (home) __ animal shelter ___ rescue __ pet store __ other (specify)_____

8. For what primary purpose was this dog bred? ___conformation ___companion/pet

___obedience ___agility ____tracking/hunting ___other (specify)_____

9. State or country in which this dog spent most of its lifetime: _____

10. As a puppy (less than 9 months), what rate of growth did you try to achieve:
__maximum __average __slow __don't know

11. As a puppy (less than 9 months), would you characterize your dog as:
__obese __overweight __average or optimum weight __underweight

12. As an adult (at least 9 mo.), what was the dog's usual:
_____weight (lb) _____height (in)

13. As an adult (at least 9 months), would you characterize your dog as:
___obese ___overweight ___average/optimum weight ___underweight

14. As an adult (at least 9 mo.), would you characterize your dog as:
___large boned ___medium boned ___small boned

15. Please record the **number of times** each food type is/was fed in the appropriate boxes, based on your dog's **ADULT DIET** (**at least 9 months of age**):

Type of Food	**Frequency of Feeding**		
	Daily	**Weekly**	**Monthly**
Dry			
Canned			
Home prepared			
Table scraps			
Other (specify)			

16. For the commercial foods **fed daily** for the longest period of time, list the first four ingredients as stated on the label:

Dry: 1)_____ 2)_____ 3)_____ 4)_____

What is the Brand_____ & Variety_____

Canned: *1)_____ 2)_____ 3)_____ 4)_____

*Do NOT include water as an ingredient

What is the Brand_____ & Variety_____

17. For the home prepared foods fed daily for the longest period of time, list the most common types fed using the table below:

1)_____ 2)_____ 3)_____ 4)_____

Home Prepared Food Codes	
(1) Vegetables	(7) Yogurt
(2) Fruit	(8) Eggs
(3) Red meat (e.g., beef, lamb, venison)	(9) Pasta
(4) White meat (e.g., chicken, turkey, pork)	(10) Bones
(5) Other meat	(11) Dairy
(6) Fish	(12) Other

18. Please check the boxes based on the supplements given your dog as an adult (at least 9 months of age)

Type of Supplement	Supplements Given		
	Daily	Weekly	Monthly
Vitamin / Multivitamins			
Minerals			
Cartilage supplement (e.g., glucosamine)			
Food Supplement (e.g., vinegar, garlic)			
Other (specify) _____			
Other (specify) _____			
Other (specify) _____			

19. On average, how many shows a year did/does this dog attend (choose a typical year during which the dog was actively competing):

__ field events __ agility trials __ obedience trials __ tracking tests __ conformation shows

__pet therapy visits __other (specify) _____

20. How is your dog primarily housed (more than 50% of the time):

__ in a crate in the house __ kennel (indoor) __ kennel (inside/outside) __kennel (outside)

__ fenced yard __free in house __garage __ Other (specify)_____

21. Does your dog sleep on your bed? __never __sometimes __usually __always

22. What is the current vital status of this dog?

___alive ___died ___euthanatized

23. If died, date of death: _____ month _____day _____year

24. Was death due to euthanasia for Syringomyelia?

___ Yes ___ No

25. If died, what was the cause(s): _____

Please choose causes from table below:

Cause of Death Codes			
(1)	Cancer	(8)	Autoimmune disease
(2)	Old age, dementia	(9)	Neurological / epilepsy
(3)	Heart failure	(10)	Trauma
(4)	Kidney failure	(11)	Infection
(5)	Liver failure	(12)	Endocrine disease
(6)	Gastrointestinal disease	(13)	Other (specify)_____
(7)	Musculoskeletal / arthritis	(14)	Unknown

26. If died, was the above cause of death verified by a veterinarian: ___Yes ___No

27. If died, was an autopsy performed: ___Yes ___No

28. Age at death of parents: Dam: ____ years ____ unknown
Sire ____ years ____ unknown

Dam still alive ____
Sire still alive ____

III. Personality and Temperament

How would you rank your dog on a scale of 1 to 10 for each of the following characteristics?
Please check the rank that applies:

	Never		**Low**		**Sometimes**		**Always**			**High**
1. Active or energetic (activity level)	1	2	3	4	5	6	7	8	9	10
2. Excitable	1	2	3	4	5	6	7	8	9	10
3. Aggressive to dogs	1	2	3	4	5	6	7	8	9	10
4. Aggressive to people	1	2	3	4	5	6	7	8	9	10
5. Possessive or Territorial	1	2	3	4	5	6	7	8	9	10
6. Submissive to dogs	1	2	3	4	5	6	7	8	9	10
7. Submissive to people	1	2	3	4	5	6	7	8	9	10
8. Fearful of people	1	2	3	4	5	6	7	8	9	10
9. Fearful of environmental change*	1	2	3	4	5	6	7	8	9	10
10. Obsessive Compulsive	1	2	3	4	5	6	7	8	9	10
11. Fly Catchers Syndrome	1	2	3	4	5	6	7	8	9	10
12. Happy	1	2	3	4	5	6	7	8	9	10
13. Trainable	1	2	3	4	5	6	7	8	9	10

*Environmental changes include thunder, guns, firecrackers, other loud noises, etc.

14. Did this dog ever receive professional counseling or behavior modification for a behavior problem?
___Yes ___No

15. Was this dog ever medically or clinically treated for a behavior problem: ___Yes ___No

16. Was euthanasia ever considered in any way for a behavior problem? ___Yes ___No

IV. Health Related Conditions

- For the **Malignant Neoplasms** (**Cancer)** and **Non-malignant Neoplasms** questions on the next two pages, use the **Location** codes from the following table.
- **Write in the location code after the tumor type.**

Location Codes for Malignant and Non-Malignant Neoplasms				
1. Bladder	6. Heart	11. Lung	16. Nerve	21. Spleen
2. Bone	7. Intestine	12. Lymph nodes	17. Ovary	22. Testes
3. Brain	8. Kidney	13. Mouth	18. Pancreas	23. Uterus
4. Breast	9. Limb/digits	14. Muscle	19. Prostate	24. Unknown
5. Eye	10. Liver	15. Nasal cavity	20. Skin	25. Other*

If 'Other' please specify location: _____

1. For each of the conditions listed below, please indicate those that affected your dog, the age at **first** diagnosis, whether a veterinarian confirmed that diagnosis, and if the condition was treated, cured, or a recurrent problem. Room is provided for you to list additional conditions.

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Malignant Neoplasms (Cancer) ***Write in Location codes from chart above***									
Adenocarcinoma Location code _____									
Fibrosarcoma Location code _____									
Hemangiosarcoma Location code _____									
Lymphoma (Lymphosarcoma) Location code _____									
Malignant Giant Cell Location code _____									
Mast Cell tumor Location code _____									
Melanoma Location code _____									
Mesothelioma Location code _____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Malignant Neoplasms (con't)									
Myeloma Location code _____									
Osteosarcoma Location code _____									
Sertoli cell tumor Location code _____									
Squamous cell tumor Location code _____									
Transitional cell carcinoma Location code _____									
Carcinoma, unspecified Location code _____									
Sarcoma, unspecified Location code _____									
Other _____ Location code _____									
Unknown Location code _____									
Non-Malignant Neoplasms									
Lipoma Location code _____									
Papilloma (wart) Location code _____									
Other Non-malignant Specify _____ Location code _____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Cardiovascular									
Heart failure (unknown cause)									
Cardiomyopathy									
Heartworm Infection									
Heart arrhythmia									
Heart murmur									
Pulmonic stenosis									
Sub Aortic stenosis									
Mitral Valve Disease									
Other_____									

Regarding <u>confirmed</u> Mitral Valve Disease:

1. Did the dog show "clear" at a later date by another cardiologist? ____ Yes ____No
2. Was it confirmed by Ultrasound/Color Doppler? ____ Yes ____No
3. Age medication was started? ____ years ____ months
4. Name of medication(s) and in order of use:_____
   _____
   _____

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Allergies									
Allergic dermatitis due to:									
Fleas									
Food									
Inhaled allergens									
Contact_____									
Other_____									
Atopic rhinitis									
Anesthesia allergy_____									
Eosinophilic Granuloma									
Drug allergy_____									
Other allergy_____									
Endocrine									
Hypothyroid									
Hyperthyroid									
Cushings (hyper adrenal)									
Addisons (hypo adrenal)									
Diabetes mellitus									
Pancreatic insufficiency									
Other_____									
Gastrointestinal									
Bloat									
Mega esophageal disorder									
Esophageal disorder-other									
Gastritis (chronic or intermittent)									
Excessive vomiting									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Gastrointestinal (con't)									
Excessive diarrhea									
Excessive flatulence									
Malabsorbtion									
Colitis									
Foreign body									
Other_____									
Hematologic									
Hemophilia									
Autoimmune hemolytic anemia									
Chronic anemia									
Mycrothrombocytopenia									
Thrombocytopenia									
Bone marrow failure									
Other_____									
Urinary Tract / Renal									
Kidney disease									
Kidney failure									
Bladder stones									
Bladder infection(s)									
Urinary incontinence									
Other_____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Neurological									
Seizures (unknown origin)									
Seizures (known origin)									
Wobblers syndrome									
Dementia (senility)									
Nerve degeneration									
Tremors - generalized									
Other_____									
Musculoskeletal									
Eosinophilic panosteitis									
Osteochondritis dissecans									
Hip dysplasia									
Elbow dysplasia									
Spondylosis									
Degenerative Disk Disease									
Anterior cruciate ligament tear									
Arthritis (autoimmune)									
Arthritis (Seniors)									
Patella luxation									
Syringomyelia									
Other_____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Eyes									
Progressive retinal atrophy									
Retinal folds									
Juvenile (early onset) cataracts									
Cataracts – adult onset									
Glaucoma									
Entropion									
Ectropion									
Prolapsed 3rd eyelid									
Distichiasis									
Corneal Abrasion									
Corneal Ulcers									
Dry Eye									
Injury									
Other_____									
Ears									
Hearing problem first noticed									
Chronic ear infection									
Acute ear infection									
Ear Mites									
Other_____									

Questions concerning Hearing Problem:

a. Was the BAER test used? ☐ Yes ☐ No

b. Age became a serious problem? _____ years

c. Age became totally deaf?: _____ years

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Reproductive - Female									
Infertility									
Failure to carry to term									
Early Sterility (before 5 years of age)									
Premature Delivery(s)									
Caesarian delivery									
Irregular heat cycles									
Chronic false pregnancy									
Difficult whelping (dystocia)									
Mastitis									
Pyometra									
Insufficient milk									
Malformed puppies									
Poor mothering instinct									
Other_____									
Reproductive - Male									
Early Sterility (before 8 years of age)									
Low sperm count									
Abnormal semen									
Can't perform natural tie									
Cryptorchidism unilateral									
Cryptorchidism bilateral									
Prostate infection(s)									
Enlarged prostate									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Reproductive-Male (con't)									
Lack of libido									
Testicular atrophy									
Other_____									
Skin & Coat									
Pyoderma									
Dull and dry									
Rough Coat "syndrome"									
Seborrhea									
Pigment abnormalities									
Coat color change									
Sebaceous cysts									
Sebaceous adenitis									
Hot spots									
Excessive coat									
Thin coat									
Other_____									
Trauma / Accidents									
Fracture / broken bone									
Lameness needing treatment *(not due to fracture or cruciate tear)*									
Laceration requiring stitches									
Other_____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Infections/Infestations									
Bacterial									
Anal sacculitis									
Pneumonia									
Prostatitis									
Cystitis									
Tonsillitis									
Septicemia									
Lyme disease									
Ehrlichiosis									
Basesiosis									
Rocky Mountain Spotted Fever									
Interdigital infection									
Other_____									
Viral									
Parvovirus									
Corona virus									
Distemper									
Tracheobronchitis *(kennel cough)*									
Other_____									
Fungal									
Ringworm									
Other_____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Parasitic									
Giardia									
Coccidia									
Roundworms									
Hookworms									
Whipworms									
Tapeworms									
Demodectic mange									
Sarcoptic mange									
Ear Mites									
Cheyletiella mites									
Tick problems									
Flea problems									
Other_____									
Oral - Dental									
Malocclusion - Overbite									
Malocclusion - Undershot									
Level Bite									
Missing teeth									
Gingivitis									
Other abnormal dentition									
Other_____									

	AGE AT ONSET	DIAGNOSED BY VET		TREATED		CURED		RECURRENT PROBLEM	
CONDITIONS	**YEARS**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Behavior Problems									
Possessive Aggression									
Fear Aggression *(aggressive only when afraid)*									
Dominance Aggression									
Obsessive-Compulsive Disorder									
Territorial Aggression									
Fly Catchers Syndrome									
Phobias *(abnormal fear response)*									
Timid or Extremely Shy									
Extremely Fearful *(although with no aggression)*									
Inappropriate Urination									
Separation anxiety									
Other_____									
Congenital Birth Defects									
Umbilical hernia									
Inguinal hernia									
Diaphragmatic hernia									
Club Foot/Feet									
Swimmer Puppy									
Cleft Lip									
Cleft Palate									
Other_____									

2. The following questions concern **Syringomyelia** or **Chairi 1 Malformation (SM)**:

a. Do you suspect your Cavalier has SM?
☐ Yes ☐ No

b. If yes, at what age did your dog first show signs of SM?
☐ (<1) ☐ (1-2) ☐ (3-4) ☐ (4-6) ☐ (7+) years of age

c. Was your cavalier diagnosed with SM by a veterinarian?
☐ Yes ☐ No

d. At what age was your cavalier diagnosed with SM?
☐ (<1) ☐ (1-2) ☐ (3-4) ☐ (4-6) ☐ (7+) years of age

e. How was the diagnosis made?
☐ MRI ☐ Post Mortem ☐ Suspected on clinical signs only

f. What were the initial clinical signs of SM? (Please check all that apply)
☐ Shoulder scratching
☐ Scratching elsewhere (specify) _____
☐ Neck pain
☐ Pain elsewhere (specify) _____
☐ Screaming when scratching
☐ Screaming when excited
☐ Screaming when touched
☐ Screaming when change of head position
☐ Screaming when jumping
☐ Screaming for no apparent reason
☐ Scoliosis (twisted spine esp. neck)
☐ Wobbly hind limb gait
☐ Weak forelimbs

g. Was surgery performed for SM?
Yes ☐ No ☐

h. What are the current clinical signs your Cavalier is experiencing? (Please check all that apply)
☐ Appears normal
☐ Shoulder scratching
☐ Scratching elsewhere (specify) _____
☐ Neck pain
☐ Pain elsewhere (specify) _____
☐ Screaming when scratching
☐ Screaming when excited
☐ Screaming when touched
☐ Screaming when change of head position
☐ Screaming when jumping
☐ Screaming for no apparent reason
☐ Scoliosis (twisted spine esp. neck)
☐ Wobbly hind limb gait
☐ Weak forelimbs

i. Are you aware of any 1st degree relatives (sire, dam, siblings) that are affected?
Yes ☐ No ☐

3. Please check the appropriate boxes according to your dog's vaccination schedule:

	Frequency of Vaccination				
Type of Vaccination	**Never**	**Sporadic**	**Every 3 Years**	**Every 2 Years**	**Yearly**
Rabies					
Distemper					
Parvovirus					
Para influenza					
Adeno 2					
Corona Virus					
Leptospirosis					
Lyme Disease					
Kennel Cough					
Titer Checks_____					
Titer Checks_____					
Other_____					
Other_____					
Other_____					

4. Frequency of routine worming:
___Never ___Sporadic ___Every 3 years ___Every 2 years ___Yearly
___Based on positive fecal test

Use of heartworm preventative:
___Never ____ProHeart 6 (every 6 months injection) ___Monthly (12 months)
___Monthly (summer only)

5. Please check the appropriate boxes based on your dog's exposure to chemicals and pesticides:

Frequency of Exposure					
Type of Exposure	**Never**	**Sporadic**	**Summer**	**Monthly**	**Weekly**
Lawn Chemical Contact					
Tick/Flea Dips					
Tick/Flea Product – Drops on skin					
Tick/Flea shampoos					
Tick/Flea – Spray/Powder					
Natural Flea/Tick Product					
Tick/Flea other_____					
Swimming – Pool					
Swimming – Fresh Water					
Swimming – Salt Water					

6. How often are herbicides and or pesticides applied to your yard?

___ never ___ sporadic ___ seasonally ____ regularly throughout year

7. If a lawn care product is applied, how much time elapses before the dog is allowed direct contact with treated yard?

_____ don't use _____ 12 hours or less _____ at least 24 hours ____ > 24 hours

8. Do you frequently walk your dog through areas known to be treated with chemicals for weed control (areas such as golf courses or subdivision green spaces): _____ Yes _____ No

9. Was this dog ever involved in an automobile accident that required treatment by a veterinarian?

___Yes ___No

10. Has this dog ever had any adverse drug reactions? ___Yes ___No

    a. If Yes, what was the drug involved: _____

    b. Was this drug reaction diagnosed by a veterinarian? ___Yes ___No

    c. How old was the dog when this adverse drug reaction occurred? ___Years ___Months

11. Was this dog ever hospitalized for any health-related conditions other than those noted in the tables starting on page 8? ____Yes ____No

If YES, please specific with details_____

_____

_____

V. Additional Comments

Please use the back of this page if needed or add additional pages to tell us <u>anything</u> about the health of this dog that was not covered in this questionnaire!

If you would like this dog entered into a future ACKCSC health and longevity survey or study, please indicate your willingness to participate by providing the information below:

Dog's Registered Name: _____

Dog's Call Name: _____

Your Name: _____

Your Full Address: _____

_____

Your Telephone Number: _____

It may be necessary to contact you to collect missing information or clarify certain items on this survey. If we need to reach you, what is your preferred method of contact?

☐ Telephone: _____

☐ E-mail:_____ (E-mail address)

*The above information will be kept at Purdue University and will remain **CONFIDENTIAL.***

***Thank you** for your participation in this health survey of Cavalier King Charles Spaniels. Please return your questionnaire(s) to:*

Cavalier King Charles Spaniel 2004 Health Survey
c/o Dr. Larry Glickman
Purdue University School of Veterinary Medicine
725 Harrison Street
West Lafayette, IN 47907-2027

Be assured that all the information will be kept strictly confidential and names of participants will not be released. After Dr. Glickman analyzes the data at Purdue University, a detailed report will be sent to the American Cavalier King Charles Spaniel Club, Inc. for publication.