

## QUESTIONS AND CONCERNS RAISED ABOUT THE HEALTH AND WELFARE COMMITTEE REPORT

The American Kennel Club has a Canine Health & Welfare Advisory Committee comprised of ten accomplished individuals who have been involved in some way with canine research, the sport of dogs, or dog breeding. This committee was consulted for "input on the request to register a group of Dalmatians commonly referred to as the Back Cross or LUA (low uric acid) Dalmatians."

Their subsequent report focuses on five questions, and then gives a recommendation. Some of their answers have raised further questions which may need to be addressed.

### 1. Are the dogs in question purebred Dalmatians?

The summary states that after 12 generations "today's descendents should be more than 99.97 % pure Dalmatian." This percentage is achieved by calculating the number of descendant generations, and in that respect the percentage description is correct.

However, this method does not address the concept of gene linkage, that is, that genes do not assort independently the way chromosomes do. Traits tend to be inherited together as a consequence of an association between their genes; all of the genes of a given chromosome are linked (where one goes they all go). Genes that are closely linked on the same chromosome tend to be inherited together. The actual percentage of the gene purity of the backcross descendents has yet to be measured.

The significance of this concept is that, as Dr. Bannasch's study indicated, there are several genes in the homozygous region that are found in purebred AKC Dalmatians and not in backcrosses. The functions, if any, of these other genes that have been gained - or lost - via the backcross breedings have not yet been identified.

### 2. What is known about Dalmatians and high uric acid?

The second concept is described well, although the use and meaning of the word "often" in the second sentence is debatable.

### 3. Are urate uroliths a significant health issue in Dalmatians?

The report correctly states "the exact frequency of urate stone disease in Dalmatians is unknown." The studies cited have serious methodological problems, and were not designed to ascertain the true prevalence of stone disease. For instance, the number 34.3% derives from an online Internet survey that encompassed 179 Dals, of which 99 were males, and the author of the paper where it first appears later wrote "at no time was the population of dogs surveyed intended to be or represented as a probabilistic sample of the owned population of Dalmatians in the United States." The 13.8 % number from the same article comes from the visits at a veterinary teaching hospital, and the author later writes "This too is not a population representative of the owned population of Dalmatians."

The Health & Welfare Committee Report notes that the Minnesota Urolith Laboratory diagnosed 9,095 Dalmatians presenting with stones, or almost 500 Dalmatians per year, over a 20 year span. But the report fails to take into consideration that more than 370,000 Dalmatians were registered with AKC during those years. Extrapolating from that figure, at least an equal number of AKC registration-eligible Dalmatians were also born. Considering that this time frame took in the Disney 101 Dalmatians releases, a case could be made that there were also a large number of unregistered purebred Dalmatians born during that time. The total of these imperfect figures compared to the 9,095 Dalmatians from the Minnesota study would yield a prevalence rate of less than 1%. This is as valid a comparison as that cited by the committee, neither one being based on scientific fact.

If we are to be honest here, no one knows exactly how many Dalmatians were born/living during that 20 year period, nor do we know how many presented with stones analyzed by another laboratory (although Minnesota Urolith Laboratory, the premier center of its kind, provided free stone analysis, which would weight the number of tests going to that particular lab.) See Analysis Chart on Page 53.

Other data from pet insurance and veterinary office visits suggest a much lower prevalence than the committee report implies. One nationwide veterinary practice, Banfield the Pet Hospital, reported that from 4264 Dalmatian veterinary visits during 2009, 19 Dalmatians were diagnosed with stones (0.445%); the ma-

majority of diagnoses were reported in dogs 10 years of age or older.

### 4. Are high levels of uric acid a predisposing factor to urate uroliths?

Point four is easy to skim over but is of significance in that the committee reiterates that "while all purebred AKC Dalmatians exhibit high levels of uric acid, not all of them form stones, not all stone formers block, and not all dogs with blockage require surgical intervention." The committee goes on to recommend that continued research "is warranted to determine what additional genes or environmental factors may influence the actual formation of stones." Indeed, the Dalmatian Club of America Foundation has funded research which is now underway, comparing litter brothers to look for factors explaining why one has urinary stone symptoms and the other does not. The underlying theory is that the triggers for stone formation are either lack of inhibitors or presence of promoters of crystallization, not just the high uric acid levels.

### 5. Could selective introduction of the LUA Dalmatians into the AKC Dalmatian gene pool have a positive impact on the health and welfare of the breed?

While the committee concludes that the low uric acid gene could provide positive health benefits to the breed, it does not address any potential side effects of such an introduction. Just as any new drug or surgical procedure has both risks and benefits, some identification of the potential and real side effects should be investigated. As already mentioned above, what other genes linked to the low uric acid gene have been introduced with the backcross, and what Dalmatian genes have been lost?

#### Committee Recommendation:

The committee strongly recommends a slow, controlled introduction of the low uric acid gene, cautioning that rapid reintroduction of a normal functioning SLC2A9 "will result in a significant population bottleneck and loss of genetic diversity". But the committee states no clear directions on how this should be accomplished or who will determine the control. While a worthy goal to state, the implementation could be extremely challenging. What is needed is a procedure for moving forward with this experiment. Education, discussion and cooperation will be necessary in order progress with the recommendation.

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**Minnesota Urolith Laboratory 1981-2001 Study Figures Analyzed**

	<b>A</b>	<b>B</b>	<b>C</b>	<b>E</b>	<b>I</b>	
1981	5,482					
1982	5,409					
1983	6,032					
1984	6,354					
1985	6,880					
1986	8,170					
1987	11,291					
1988	14,109					
1989	17,488					
1990	21,603					
1991	30,225					
1992	38,927					
1993	42,816					
1994	42,621					
1995	36,714					
1996	32,972					
1997	22,726					
1998	9,722					
1999	4,652					
2000	3,084					
2001	2,139					
	369,416	820,924	0.45	9,095	0.011	1.10%
		738,832	0.50	9,095	0.0123	1.20%

Column A = number of Dalmatians registered with AKC from 1981-2001

Column B = number of Dalmatians that could have been registered with AKC from 1981-2001 based on litter application numbers recorded with AKC and applying the percentage of dogs in a litter usually registered with AKC

Column C = % of dogs registered using the actual total of 369416 and dividing it by 50% and by 45% - AKC captured 45 - 50% of puppies applied for during this period

Column E = the number of stones/dogs reported at the MN Urolith Center laboratory between 1981 and 2001

Column I = the percentage of AKC Dalmatians alone this represents

*It's important to understand that the terms stones and dogs are used interchangeably in the Osborne survey so although it refers to dogs, some percentage of stones could represent redundancies. If it's true that 1/3-1/2 of Dals that form stones repeat, this redundancy could significantly reduce the number of Dals represented by the stones.*

*It's also true that other registries were registering Dals at the same time and there is no data for the Dals that weren't registered with any registry. Finally, it's critically important for readers to understand the MN lab's dominance as THE lab used by vets and vet hospitals during the period, For Free!*