

Backcross Project: Long-Standing Issues

By Robert H. Schaible, Ph.D.

The recent vote by DCA members showing the majority in favor of resuming consideration of the backcross project was very heartening. I thank all of those who did vote, whether for or against, as the total vote gives an indication of what needs to be accomplished if the goal of AKC registration is to be attained. In the report of the Delegates Quarterly Meeting, July 1981 issue of the *AKC Gazette*, pp. 86-87, President William F. Stifel gave a detailed account of why the American Kennel Club initially registered two backcross Dalmatians. Correspondence subsequent to the hold placed on further registrations has indicated that DCA, the parent breed club, must be in favor of resumed registration before AKC will reconsider the matter. I would like for DCA members to consider three issues that seem to have influenced the acceptance or rejection of the backcross project by some of our ranks.

First, the Backcross Project provides a means for eliminating urate stones in future generations of Dalmatians but provides no help for those currently afflicted. Immediate results are nearly always more convincing than promises for the future. When I initiated the Backcross Project, I was a member of the faculty of one of the first departments of medical genetics in the country. M.D.'s and Ph.D.'s in the department were equally enthusiastic about developing methods for reducing the incidence of genetic diseases.

It was a shock to me when some medical professionals among the DCA membership would only support medical treatment for urate stones and not favorably consider the backcross method for replacing the defective gene in uric acid metabolism. But when we realize that nearly all of the training and experience of the medical profession is directed toward treating individual patients, rather than populations, it should be no surprise that the medical profession in general holds methods of individual treatment in the highest regard. Although D.V.M.'s are trained in much the same way as M.D.'s, their practice must satisfy the needs of their clients in regard to herds of animals as well as to individual animals. Members of DCA tend to rely on those of the medical profession within their ranks in regard to health issues and probably have been dismayed that most of the veterinarians favor the Backcross Project but many medical doctors do not.

Second, many DCA members are concerned that undesirable traits as well as the gene for normal metabolism of uric acid will be transferred to Dalmatians through the Backcross Project. Most of the genes that direct the development of a dog are the same in all breeds. Only a very small percentage of the genes differ between any two breeds. That small difference is cut in half by the first cross between breeds and cut in half again with every subsequent backcross to a parent breed (purebred Dalmatian in this case). Thus, the progeny of the fourth backcross differ from the parent breed by 3.125% of the small percentage of genes by which the parents in the original cross differed.

A reasonable estimate of the average mutation rate of genes is one in 100,000, which means that in a population of 50,000 Dalmatians, a mutation of every gene may exist. It's only by constant selective breeding that the undesirable genes are eliminated from the purebred population. The few undesirable genes that are brought in by the fourth backcross to the purebred parent have already been in the population or will be anyway in the future. The number of recessive genes that are detrimental to health are estimated to be 3-10 for the average human or animal. Breeders who closely linebreed their animals usually become aware of those genes when they are expressed in progeny who can get the same recessive gene from each of their related parents. Breeding to improve animals is not an exact science. We do not always get what we expect or hope for. If we did, it would not be much fun. We all appear to get some pleasure from gambling.

Third, the spotting pattern, which is the hallmark of the breed, usually is not as good in the normal uric acid backcross Dals as the pattern that has been attained in the pure breed. Although, most of the backcross Dals that have normal levels of uric acid have smaller spots, with less definite margins and more interspersed white hairs than are typical of show-type, purebred Dals, we have been able to produce a few that are comparable to the latter. The spotting on Opie and Topper, their dam, Budgette, and Topper's sire, Amber Sun is typical of show-type, purebred Dals. Photos of Opie and Topper can be seen on my web site, www.smithville.net/~bcschaible, and Budgette and Opie in the *Spotter* pedigree issues for Spring 1996 and 1999, respectively.

To attain good spotting in normal uric acid backcross Dals, I have selected Dals with oversize, sharply margined spots for the purebred parent in most of my recent backcross matings. Many Dals descended from Count Miguel of Tuckaway and Fireman's Freckled Friend have those spotting characteristics. When I do get a normal uric acid pup with good spotting most of the high uric acid littermates have the oversize, sharp spots. Therefore, it appears that the gene or genes that are required for oversize, sharp spotting in the pure breed are required in normal uric acid backcross Dals to obtain the type of spotting desired in the show-ring today. In selective breeding it is usually best to select the ideal rather than the extreme as parents. But for good spotting patterns in the normal uric acid Dals, it will probably be better to select the more extreme spotting in the purebred parent until normal uric acid parents can consistently produce good spotting in their normal uric acid progeny.

DCA members have raised other significant issues for which, I believe, definitive answers have been or can be provided from information currently available. The three issues that I have addressed seem to me to require more explanation and discussion.