

Questions on LUA for all DCA Members to Think About

By Scott E. Facey

Is The Backcross Project Everything it is hyped up to be?

The LUA backcross project would like people to believe that we can eliminate HUA in the breed and because of the DNA test now available this will be an easy fix. Remember that right now 100% of our breed is affected with the recessive trait.

To give you an idea of what the Dalmatian community is up against in regard to eliminating HUA from the gene pool there is a wonderful mathematical equation that will give you an idea just how long it will take in the book "Genetics of the Dog" by Malcolm B Willis, pgs. 296 and 297.

I won't go into the actual math, but if the LUA community had any homozygous LUA dogs to breed from (remember those dogs don't presently exist) and if they only bred homozygous and heterozygous LUA dogs (no HUA recessive dogs which right now are in every breeding being done) it would take 36⁺ years just to get the recessive down to 1 in 100 and that is just within the current LUA breeding colony. It still will not eliminate it. Now get creative in your own minds and try to rationally figure out how long it would take to spread the LUA gene across the entire Dalmatian population. You will be looking at hundreds of years and even then HUA will not have been eradicated. Meanwhile what is to be done with all the HUA Dalmatians that will still be produced?

The following quote is from Malcolm Willis:

"If the reader experiments with other figures in the formula he will come to the conclusion that the elimination of recessives is more or less impossible. The task may be accelerated in some degree by test-mating and culling 'carriers' as well as affected dogs but this would increase the generation time and cost involved and, as the allele becomes rare, fewer 'carriers' would be identified.

This may have been a rather mathematical concept and will bring criticism no doubt from those cynics who believe that dog breeding is an art. Usually such cynics are those who talk about eliminating defects. We can never totally eliminate defects. All we can hope to do is reduce them to such levels of incidence that they are rare enough to cause minimal economic loss within the breed."¹

The last sentence of the above quote carries with it significant questions that we all must answer. Are we in the breed to produce dogs that conform to the Standard or are we in the breed only for economic gain? Is the problem truly severe enough in the population that we must use the drastic step of changing the breed as a whole? There is no scientific evidence of how pervasive stone blockage is within the breed. Nobody knows for sure because the incidence within the breed has NEVER been unequivocally quantified.

Going back to the DNA test mentioned earlier another question is posed. Does the DNA test created by Dr. Bannasch differentiate between homozygous and heterozygous LUA Dalmatians? Dr. Schaible actually answered this question himself at the 2008 DCA annual meeting. He said that one litter of LUA to LUA pups had been checked using the DNA test and there was one homozygous LUA and three heterozygous LUA pups in the litter. I find it incredulous that any researcher would ask us to take the DNA test as infallible based on one puppy being tested as being homozygous and further there being no proof that this is actually the case because there were no progeny produced by this one puppy that can actually prove and confirm that it was really homozygous!

Has low uric acid stopped Dalmatians from forming stones? Proponents tell us it is like building a brick wall. Take away the bricks and even if there is mortar, tools, etc. there can be no brick wall. So the same must hold true by their reasoning regarding the backcross project. The problem is LUA has not taken away uric acid. It has lowered it but it has not eliminated it. Uric acid is still there, just in lower quantities. So is it possible that Dalmatians with LUA could still form stones? No studies have been done to prove or disprove that question. No follow up on all the progeny produced in the past 30 years has been done to prove or disprove it either. Meanwhile, we do have all of the stone experts agreeing that HUA is not necessarily the cause of stone formation in Dalmatians and the cause remains unknown despite 70 years of research.

Could Something Else be Brought Forward in the Backcross Project?

There have been questions of what else may have been brought into our gene pool from the original Pointer/Dalmatian outcross. While proponents of the backcross project tell us that nothing else came from the Pointer, except the LUA gene, that is not actually the whole story. Proponents have already conceded that the spotting on the LUA dogs has been different from what our current HUA dogs have. There were a disproportionate number of early backcross dogs showing poor bites. While these issues could be coming from either the Pointer or Dalmatian it should be fairly obvious to anyone with even a basic knowledge of genetics that these things were showing up because of the original backcross. The LUA proponents are working on improving these aspects but these were just two things that could actually be seen in the early progeny. It begs the question how can anyone be so sure that nothing else, including things not seen by the naked eye, came through in the original Dalmatian/Pointer backcross?

A Quote from Malcolm Willis in "Genetics of the Dog" shows that this is a probability more likely than not:

"If an allele is so rare that only 1 pup in 20,000 shows it, then a kennel could carry the allele for generation after generation and not be aware of it, although some intense inbreeding might bring it to the surface.

*The fact that some particular recessive defect has not been produced in a kennel does not mean that the kennel is actually free of the allele causing the defect. It may be that the breeder happens not to have mated 'carrier' animals together or, when he has done so, the 1 in 4 ratio of affected to normals has not ensued. In many cases, however, particularly in respect of defects not obvious in early life, the breeder may be wrong in thinking that he has never produced it. What he really means is that he has not produced it in dogs he has been able to follow up; the results in dogs he has not seen after selling them are merely conjecture."*¹

This comes back to the original problem with the entire backcross project up to this point. There was very limited testing and follow up on ALL the progeny produced over the past 30 years of the program. There have been no LUA to LUA breedings (or inbreedings as the case may be) that have been conscientiously followed. To say that nothing else was brought forward from the original outcross is foolhardy without proof. Scientific protocols demand verified testing and follow up on every pup produced in the project!

The LUA itself can even be questioned at this point. Dr. Schaible in a letter to the editor of the *Spotter* in the Fall 1981 issue wrote:

*"When as many as 89 puppies are being screened, an oddball or two can be expected. Mosaics are relatively frequent among heterozygotes (individuals that have one normal gene and one abnormal gene). For example, liver spots are found occasionally on black and white Dals that are carriers of the gene for liver. Thus it is possible that part of Linus's tissue could be normal and part defective in uric acid metabolism."*²

Well, here we are 27 years later. We still only have heterozygotes to work with in the LUA project. The above quote certainly sounds like there is a possibility that something might come through or there could be questionable results compared to what we are being led to believe today by the LUA supporters. Then add the increased possibilities of what will happen when we actually get to the point of having inbreeding (LUA to LUA) and produce homozygous progeny.

Is HUA Really a Significant Problem in the Dalmatian Population?

This is really the crux of the matter. Is HUA really a problem in the breed? What is the percentage of our breed that is actually affected with stone formation and blockage? As mentioned earlier we don't have an answer and there have been no studies that actually quantify an answer unequivocally. There have been a number of studies that do shed some light however. One is our own DCA Health Survey that puts the incidence of stone formation at 3% (table 43).³ Then there are the European Cooperation of Dalmatian

Club's results from their own survey that put the incidence of stones at 4% or less based on 33% of the Dalmatians in the country at the time.⁴ There is the possibility that there may actually be benefits for our breed from having HUA. Dr. Bannasch even stated this in her talk at DCA in 2007.⁵ It hasn't been proven but it hasn't been disproved either. No studies have been done. Like anything that affects our dogs i.e.: epilepsy, hip dysplasia, cancer, etc. there are always going to be those animals that will have an adverse reaction to a particular gene/trait and those who will never show any signs of having a problem. We need to know what the actual extent of stone blockage is in the current population. We need to know if there are any benefits that may be lost by changing the current population. We need to be sure that there are no other problems that arise from the backcross. Finally, we need to know that introducing LUA really does eliminate uric acid stone formation.

Frederick B. Hutt sums it up best in his book "Genetics For Dog Breeders:"

"For the philosophers among us, the Dalmatians pose an interesting case. How did they get their remarkable physiological distinction by which they differ from other breeds? They originated in the province of Dalmatia on the west coast of what is now Yugoslavia. They were bred to run behind carriages or coaches – not to excrete uric acid in abnormal amounts. Although the founders of the breed could select for the distinctive black spotting which is an indispensable breed character of the Dalmatian, they could not select for high uric acid. They did not even know it was there. The most likely explanation is that the mutation causing it occurred in one of the original dogs from which the breed arose.

*In any case, the Dalmatians merit a special rub behind the ears because they prevent us from making arbitrary definitions of normality. When what is normal for the breed is abnormal for the species who is to say what is normal and what is not?"*⁶

Before jumping on the "bandwagon of salvation" for our breed, and considering AKC registration of backcross Dalmatians, it is incumbent on all of us to take a long hard look at what we are considering doing. The results either way will be with our breed for generations and generations to come.

References:

1. Willis, Malcolm B., *Genetics of the Dog*, 1989, Howell Book House, New York, NY.
2. *The Spotter*, Fall 1981, Vol. XI, No. 1 pgs. 52 & 57.
3. DCA 2001 Health survey table 43.
4. World Association For Dalmatians "The health of the Dalmatian in the Netherlands and in Norway," http://www.wafdal.org/article_02.html
5. 2007 DCA Specialty Betty Garvin Lectures DVD "Dannika Bannasch, DVM, PhD. The Uric Acid Gene."
6. Hutt, Frederick B., Cornell University, *Genetics For Dog Breeders*, 1979, W. H. Freeman and Company, New York.