



Below are the chances any given puppy in a litter from the indicated mating will have the genotype of N/N, D/N or D/D. **Matings that produce, or are comprised of an LEMP-D/D dog are not recommended and are shown in red.**

LEMP genotypes of parents	Average probability LEMP-N/N puppies	Average probability LEMP-D/N puppies	Average probability LEMP-D/D puppies
N/N x N/N	100%	0%	0%
N/N x D/N	50%	50%	0%
N/N x D/D	0%	100%	0%
D/N x D/N	25%	50%	25%
D/N x D/D	0%	50%	50%
D/D x D/D	0%	0%	100%

### Breeding Recommendations

In general, LEMP-D/D dogs should not be used for breeding. We do not recommend automatic exclusion of LEMP carrier (D/N) dogs from the breeding pool. We do recommend avoiding matings that have the potential to produce affected (D/D) offspring. As long as one of the two parents is LEMP clear (N/N), affected offspring will not be produced.

In a global group of more than 5,000 Leonbergers which have been submitted to our laboratories, about 14% were D/N carrier dogs. Immediately eliminating all D/N dogs from breeding may have negative consequences for the genetic diversity of the breed. We recommend to test litters of D/N x N/N matings, and if all other considerations are equal, preferentially the N/N pups (50%) should be kept for future breeding.

Within the Leonberger breed LPN1, LPN2, and LEMP genotypes must all be considered when selecting breeding pairs. LPN2 affected dogs (both D/N & D/D) are not recommended to be bred. Within in each mating pair, at least one parent should be should be LEMP clear (N/N).