

Better Bred

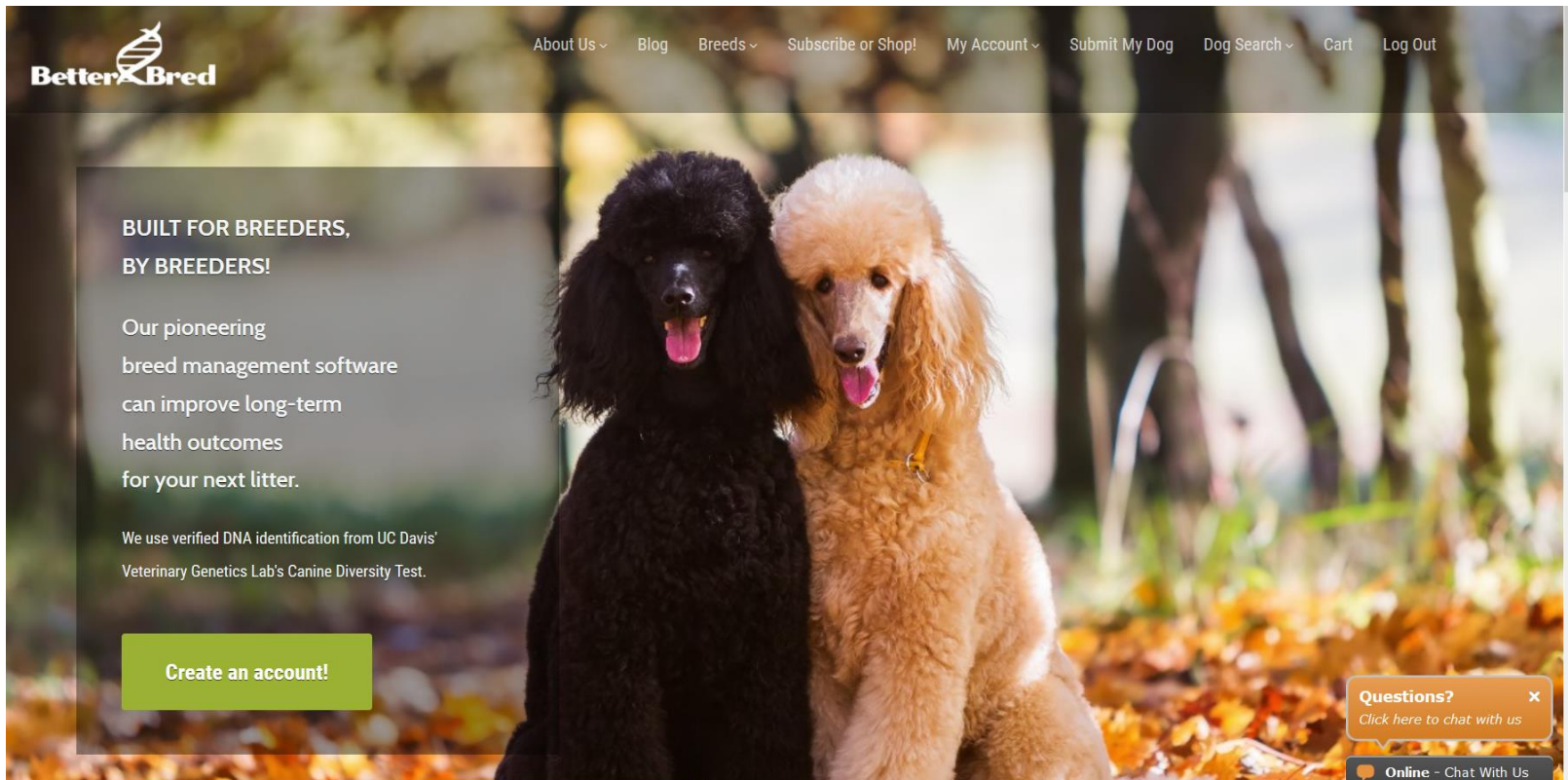
The Irish Wolfhound Diversity Programme

Presentation by
Dr Maura Lyons



What is BetterBred

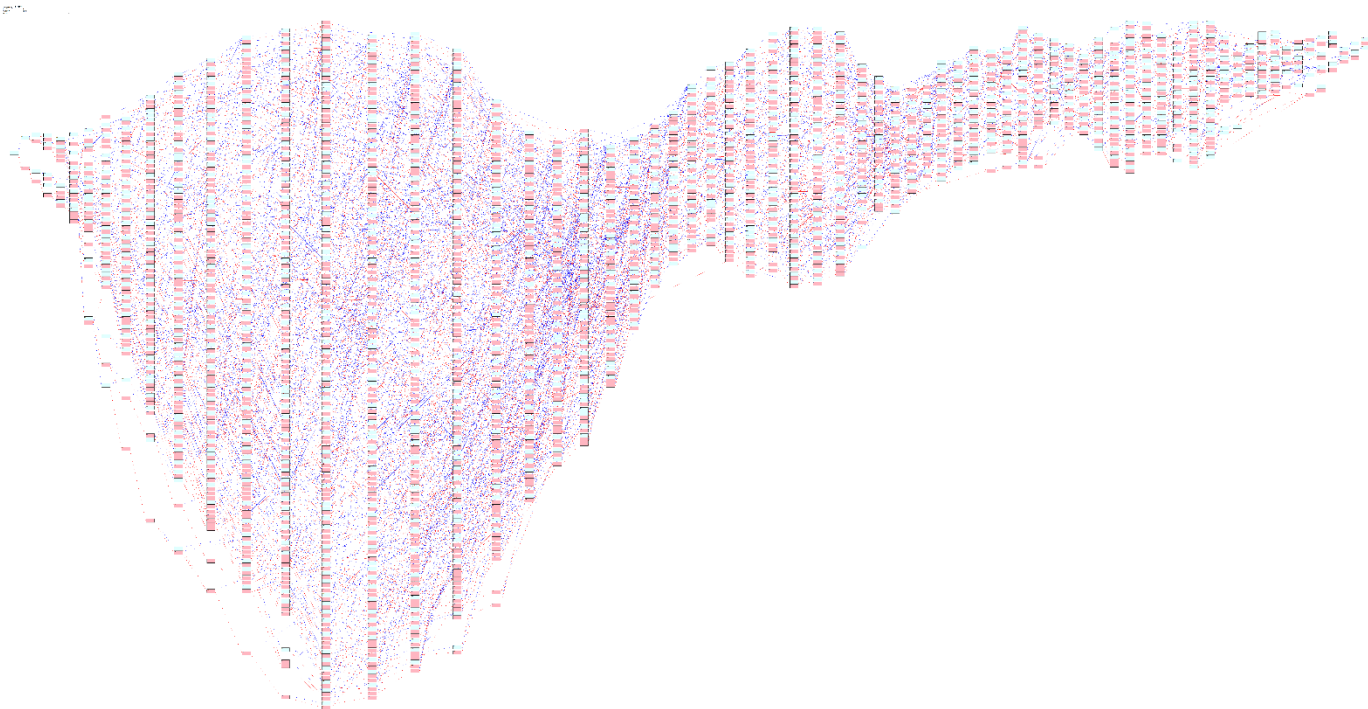
- BetterBred – a suite of breed management software and tools.
- Useful tools for breeders to interpret diversity parameters



The image shows a screenshot of the BetterBred website. The background is a photograph of two poodles, one black and one apricot, sitting on a bed of autumn leaves. The website's navigation bar at the top includes links for 'About Us', 'Blog', 'Breeds', 'Subscribe or Shop!', 'My Account', 'Submit My Dog', 'Dog Search', 'Cart', and 'Log Out'. The BetterBred logo, featuring a DNA double helix, is in the top left corner. A dark grey text box on the left contains the following text: 'BUILT FOR BREEDERS, BY BREEDERS!', 'Our pioneering breed management software can improve long-term health outcomes for your next litter.', and 'We use verified DNA identification from UC Davis' Veterinary Genetics Lab's Canine Diversity Test.' Below this text is a green button that says 'Create an account!'. In the bottom right corner, there is a chat widget with the text 'Questions? Click here to chat with us' and 'Online - Chat With Us'.

Genetic Bottlenecks

- Loss of genetic diversity is common with pure breed dog populations breeding within closed stud books.



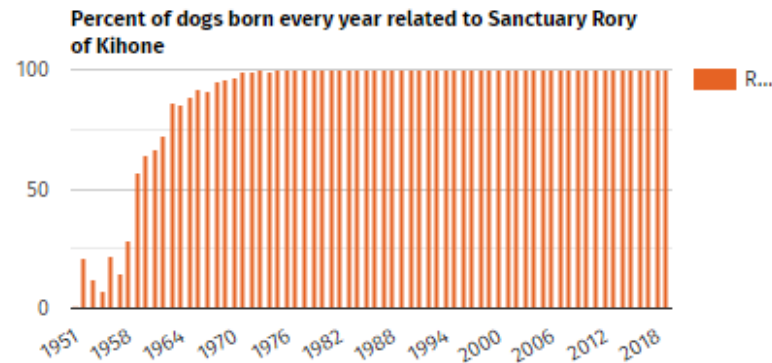
Why is Diversity Important

Sanctuary Rory of Kihone, born 31st January 1951
In the pedigree of every wolfhound born since 1982
Sired 15 litters and produced 59 offspring
21 of which went on to produce offspring themselves



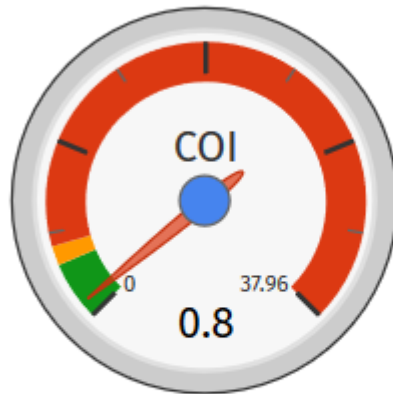
Development of Sanctuary Rory of Kihone's influence on the breed

Last dog related to Sanctuary Rory of Kihone was born in 2019
Last dog unrelated to Sanctuary Rory of Kihone was born in 1981
A total of 148,852 dogs in iwdb are related to Sanctuary Rory of Kihone.
Numbers are cached and may not include the most recent additions to iwdb



My Dog has a Low Col – he has diversity !

Coefficient of Inbreeding compared to breed average



The Kennel Club recommends breeding with a lower Coefficient of inbreeding (COI) than the average.

Average COI worldwide over the last 10 years for 5 generations is 3.56%.

Green areas are well below average COI. The yellow area marks average COI +/- 0.5% point. Red areas are well above average.

The Aim of the Project

- Establish level of diversity within population
- Provide software analysis tools for use in breeding programs

Lowest AGR to Highest	Potential Mate	Outlier Index	Average Genetic Relatedness	Internal Relatedness	Genetic Relatedness	Make Puppies!	Litter Analysis	Litter Summary
1	Pennybright Aidan	0.50	-0.19	0.23	-0.415	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>
2	Cheltigh Samuel Adams	0.42	-0.10	0.02	-0.156	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>
3	Cu Muirin Morrison Of Eagle BCAT CGC RI TKA	0.37	-0.10	0.13	-0.178	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>
4	Lean do chroí Bernard	0.37	-0.08	0.09	-0.077	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>
5	Dia Duit's Anibesa Leon	0.34	-0.02	-0.11	-0.065	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>
6	CH Swordstone Joel	0.27	0.06	-0.06	-0.095	Puppies: 500 <input type="text"/> <input type="button" value="Breed!"/>	<input type="button" value="Analysis"/>	<input type="button" value="Summary"/>

Ques
Click h

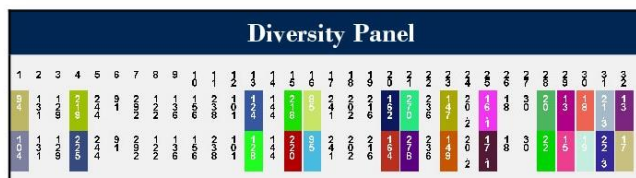
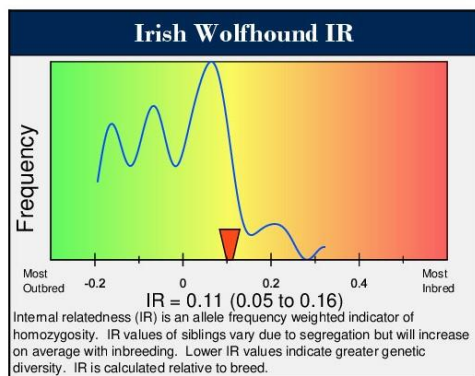
The Results Explained

DOG GENETIC DIVERSITY ANALYSIS

ACHNACON BANBHA AT MALINKEY

Breed: Irish Wolfhound
Sex: Female
Color: Red Brindle
DOB: 2011
Reg: AM01320208

Case: NCD86275
Print Date: August 21, 2019
Report ID: 2070-8723-6183-5100



Irish Wolfhound DLA

	DLA I	DLA II	
Haplotype 1	1068	2053	Maintaining diversity in the DLA which helps regulate immune responses is beneficial to a breed. Choosing mates differing in their DLA haplotypes helps maintain diversity in litters.
Haplotype 2	1105	2021	



Veterinary Genetics Laboratory

MAURA LYONS

The Results Explained

Extended DLA Haplotype 1: **1068 / 2053**

Extended DLA Haplotype 2: **1105 / 2021**

Outlier Index (OI): 0.23

Compare to Breed Average OI: 0.35

Average Genetic Relatedness (AGR): 0.07

Compare to Breed Average AGR: -0.02

Internal Relatedness (IR): 0.11

Compare to Breed Average IR: 0.02

Homozygosity by Loci (HL): 0.53

Compare to Breed Average HL: 0.43

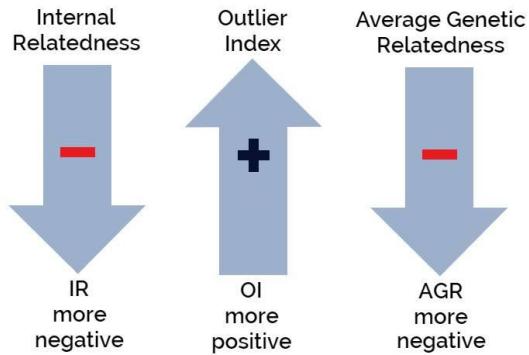
Percent of Dogs Unrelated (PCUR): 31.58

Compare to Breed Average PCUR: 56.89%

What this means to a Breeder

- <https://www.betterbred.com/2019/09/01/irish-wolfhound-test-breeding/>

To breed for diversity, you want...



Litter Prediction: Outlier Index

Average Outlier Index: **0.26**

Minimum to Maximum OI: **0.14 to 0.40**

The Outlier Index shows how unusual a dog is for the breed. Mouse over the lines to see the percentage of the litter that is likely to be at each level of OI.

LITTER SUMMARY

Ravensbeeche Comitas Of Wolvebrigg
X
Achnacon Banbha at Malinkej

Parent's Genetic Relationship:
Category 6 | Equivalent of Half-First Cousins or First Cousins Once Removed

Sire's DLA Haplotypes
1052 | 2022
1052 | 2022

Dam's DLA Haplotypes
1068 | 2053
1105 | 2021

Litter Prediction: Internal Relatedness

Average Internal Relatedness: **0.03**

Minimum to Maximum IR: **-0.40 to 0.48**

Internal relatedness assesses how inbred or outbred a dog is. Mouse over the lines to see the percentage of the litter that is likely to be at each level of IR.

State of the Breed

DLA class I and II haplotypes identified to date in Irish Wolfhounds

DLA Class I Haplotype Frequencies (Updated Oct 12, 2019)

DLA1 #	STR types	Irish Wolfhound (n=41)	Myrtle	Florrie	Dahlia
1052	380 372 289 184	0.33			
1068	380 373 287 181	0.11	A		
1094	395 375 277 176	0.21		A+B	A
1105	382 379 277 178	0.33	B		B
1213	380 372 291 184	0.02			

DLA Class II Haplotype Frequencies (Updated Oct 12, 2019)

DLA2 #	STR types	Irish Wolfhound (n=41)			
2005	339 322 280	0.22		A+B	A
2021	339 324 268	0.28	B		B
2022	339 327 282	0.35			
2031	339 322 282	0.02			
2053	343 324 280	0.11	A		
2083	339 324 282	0.01			

Supporting the Project

UC Davis Genetic Diversity Test – Research Phase

\$50.00

The world's best Canine Diversity Test, from UC Davis' renowned Veterinary Genetics Lab. Developed by dedicated veterinarians and geneticist specifically to assess genetic diversity in breeds, dogs, and matings. *Please note, results will not be received until your breed receives its initial breed report from UC Davis.*

Registered Name of Dog *

Breed *

Registration Number

Call Name

Gender *

Date of Birth (YYYY-MM-DD) *