



## **Flatcoated Retriever Society**

### **AGM Health Report March 2023**

Madam Patron, Mr President, Madam Chairman, ladies, and gentlemen.

#### **Review of work at the University of Cambridge**

I have reports from Dr Jane Dobson and Cathryn Mellersh giving an update on two of the three areas of their breed specific work which are:

- Research to understand the genetic basis of HS in the FCR carried out by KC Canine Genetics Centre in collaboration with researchers in the USA (update from Cathryn Mellersh)
- The Cause of Death Register (update from Dr Jane Dobson)
- Research to develop a blood test to diagnose Histiocytic Sarcoma (HS) in FCR (no further update received this year)

Cathryn Mellersh writes:

In January 2021 researchers in the United States published the details of two regions of the genome (called loci) that are associated with histiocytic sarcoma (HS) in Flatcoated Retrievers (FCRs) (Evans et al. 2021). This means that some dogs carry genetic variants in these regions that increase their risk of developing HS. Although the precise variants that confer risk have not been confirmed yet, identifying regions of the genome where risk variants are located is an important first step in understanding the genetic basis of HS better.

Researchers from the Kennel Club Genetics Centre (KCGC) have agreed to collaborate with the paper's authors, Dr Jacquelyn Evans and Dr Elaine Ostrander to achieve two objectives: 1. Confirm that the two loci described in the paper are indeed associated with HS risk in an independent cohort of FCRs. This is standard procedure for research studies investigating the genetics of genetically complex diseases such as cancer. DNA from a new cohort of FCRs with and without HS will be genotyped for markers within the two risk loci and statistical analysis will be used to determine whether markers on the risk versions of chromosome 5 and chromosome 19 are found in cases more often than controls. These risk versions are known as risk alleles. 2. Calculate the frequency of the risk alleles in FCRs from the UK. Assuming the association is confirmed (1 above) then knowing the frequency of the risk alleles will be essential before we can begin to consider developing a breeding tool based on either or both of these risk loci.

Update January 2023: The work described above has been completed by the Evans lab and the results are summarised below.

Risk allele on chromosome 5

Eighty-two FCRs (26 HS cases and 56 unaffected controls) were successfully genotyped for the risk allele on chromosome 5. The frequency of the risk allele in the whole cohort was 0.42, meaning about 42 out of 100 FCR chromosomes carry the risk allele. The frequency among the cases was slightly higher than among the controls (0.46 compared to 0.40). This trend is what we would expect for an allele that is associated with HS. However, the difference was not statistically significant, probably due to the relatively small numbers of dogs that were genotyped, and means we were not able to confirm association with HS in the UK population. The results also indicate

that the risk allele is quite common among the controls as well as the affected dogs. However, the frequency of the Chromosome 5 risk allele is lower in FCRs from the UK than in US FCRs (0.42 vs 0.66) confirming that different populations of the same breed can differ genetically, and that findings should be validated in specific populations.

#### Risk allele on chromosome 19

Seventy-four FCRs (18 cases and 56 unaffected controls) were successfully genotyped for the risk allele on chromosome 19. The frequency of the risk allele in the whole cohort was 0.9, meaning that nine out of ten FCR chromosomes carry the risk allele. The frequency among the cases was ever so slightly higher than among the controls (0.916 compared to 0.89) but the difference was not statistically significant. The frequency of the chromosome 19 risk allele is higher in UK FCRs compared to FCRs from the US (0.9 vs 0.73). The high frequency of the chromosome 19 risk allele in the UK means it has no potential to be used as a selective breeding tool in the UK population.

#### Summary of results

The results demonstrate that the chromosome 19 risk allele described by Dr Jacquelyn Evan and Dr Elaine Ostrander is very common in the UK FCR population and should not therefore be used as a selective breeding tool in the UK FCR population. Use of the chromosome 5 risk allele as part of a selective breeding tool has not been ruled out; however, its association with HS in the UK population remains to be confirmed and will require a larger cohort of samples to do so. The frequency of the chromosome 5 risk allele is quite high among controls as well as cases, whereas some cases did not carry this risk allele, demonstrating that HS is a complex disease and additional risk factors for this disease remain to be identified.

#### Cause of Death Register

Jane Dobson writes:

The pattern of entry for 2022 - 23 is similar but slightly lower than that reported previously with between 1 – 5 entries per month, strangely there were no entries for August & September 2022, but 7 so far this March.

	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb
2021	2	3	4	5	3	2	3	2	1	2	1	2
2022	2	3	3	2	1	-	-	1	4	1	3	2

The main cause of death reported is 'Tumour or Cancer Related' = 152 cases (67.4%), 'Old age' accounted for 19 deaths and heart disease = 11, as detailed below.

#	Answer	2021 -22	2022 - 23
1	Endocrine Disease	1	1
2	Gastrointestinal Disease	3	3
3	Haematological	4	4
4	Heart disease, Cardiac	10	11
5	Infectious Disease	1	2
6	Kidney Disease	5	5
7	Liver Disease	4	5

8	Musculoskeletal	0	0
9	Neurological	4	6
10	Old Age - age related	19	19
11	Other	7	9
12	Respiratory Disease	0	0
13	Trauma / Accident	3	3
14	Tumour or Cancer related	133	153
15	Unknown	6	6
16	Urogenital Disease	0	0
	Total	200	227

Tumour types were specified for :

Tumour type	Number 2021 - 22	2022 - 23
Histiocytic sarcoma	33	42
Haemangiosarcoma	24	26
Leukaemia	5	5
Chondrosarcoma	2	2
Carcinoma, not specified	8 + 2 adenocarcinoma	
Neoplasia, not specified	8	
Melanoma (malignant)	3 + 1 benign	4 + 1 benign
Lymphoma	9	9
Mast cell tumour	8	8
Osteosarcoma	8	9
Soft tissue sarcoma	7 + 5 sarcoma type not specified	8 + 5

This is just a brief overview of the ongoing survey, there is a wealth of information about causes of death in the breed with some heart breaking stories attached. I would be happy to share further with the Health Committee. Please may I take this opportunity to thank everyone who has contributed their information to this survey.

Cathryn Mellersh has reported separately on some ongoing genetic projects involving collaboration with the Kennel Club Canine Genetics group who are now based on the Vet School site. These studies are only possible due to the availability of tumour tissue and blood samples from our large archive built up over many years through the Tumour Survey supported by Flatcoated retriever owners & breeders.

**BVA Eye testing** -Pectinate Ligament Abnormality (PLA), clarification of grading scheme and breeding advice.

In general, it is recommended that you should not breed from dogs affected by known inherited eye conditions, but it is accepted that other factors such as the prevalence of the condition in the breed and the breed's genetic diversity may also come into play. When considering goniodysgenesis or PLA, however, it is preferable to only breed with dogs with Grade 0 or Grade 1 PLA in most breeds. Dogs scored Grade 2 (moderately affected) have a greater risk of developing and passing on the condition to offspring, in comparison to breeding dogs with Grades 0 and 1. In breeds that have significant concerns relating to maintenance of genetic diversity the Kennel Club advises that only Grade 2 dogs in excellent health, and with good results from other screening schemes, may be used cautiously for breeding with particular care to use mates with the best possible gonioscopy results (preferably Grade 0). Grade 3 (severely affected) and at highest risk of developing primary glaucoma are not recommended for inclusion in breeding programmes.

### **Group Study report to December 2022**

- 108 dogs have been enlisted in the 12 years since the Group Study began (2010)
- 18 completed questionnaires were received in 2022 (If a participant does not return the questionnaire following 3 annual reminders, then the dogs are removed from the Study Group)
- Five deaths were reported during 2022 (malignancy reported as cause of death in most cases but one was from a cardiac condition)
- Owners of 2 dogs of the first cohort of approx. 40 dogs enlisted in the study 12 years ago were still actively participating at the end of 2022.
- The study is now closed to new participants, but we continue to collect annual updates from the dogs currently enrolled, thank you once again to all those still actively participating in the Group Study.

### **Awareness raising regarding dangers of Blue Green Algae (Cyanobacteria)**

Following the sudden and heart-breaking loss of their Flatcoated Retriever during the summer of 2022 due to exposure to the neurotoxin anatoxin (one of the group of compounds found in cyanobacterial blooms) his owners have worked relentlessly with the help of scientist, Andrew Turner, at the government organisation Cefas, to investigate the specific toxin involved and raise awareness of the dangers of Blue Green algae. With Andrew Turner's involvement and the use of ground-breaking analysis, the toxin was defined as anatoxin and a scientific report of the incident has since been published. A fact sheet for owners and vet practices has been produced by Andrew Turner (in conjunction with the Veterinary Poisons Information Service) to raise awareness of the dangers of Blue Green algae and the course of action to take in the event of exposure. The full report and a copy of the fact sheet can be found on the Society website. <https://www.flatcoated-retriever-society.org/wp-content/uploads/2022/11/Cyanobacteria-Emergency-Sheet-1.pdf>

Please be aware that poisoning from Blue Green Algae can result from exposure to toxins not just in a body of water but also (as in this case) from contact with contaminated matter/algal mats on the shoreline.

Please share this fact sheet in loving memory of Cove Egginton.

I would like to thank all owners of Flatcoated Retrievers who have taken time to make contact with the Health Sub-committee during the last year, submit health reports online or complete the Cambridge University Cause of Death register, this information is treated in confidence and where permission is granted, will inform future health strategies.

Thank you too to members of the Health Sub-committee for giving your time and support.

Liz Branscombe DipAVN(Surgical) RVN  
Hon Health Secretary.