

# The AVA-ANKC Australian Canine Eye Scheme

## ANNUAL BREED SUMMARY REPORT

July 2017 to June 2018

This Report covers the annual ACES returns on almost 100 breeds on the ANKC Register, summarising those findings in detail. Attention is also drawn to a further 90 breeds where NO dogs have been presented for ACES Certification in the preceding year, although many of these may be subject to hereditary eye diseases.

Single or double asterisk marks against the names of fifteen breeds in this report recognise those instances where highly committed owners around Australia are working together actively in the interests of improved health – in ways that *either* have achieved impressive sampling levels amongst current breeding stock *or* have already demonstrated significant gains in expected long-term selection outcomes.

Other breeds may show a superscript notation, explained as follows:

(1) For any well-established breed with potentially significant eye comfort or vision threatening defects, breeders need to be vigilant over the longer term; while Breed Clubs can help to promote policies that will ensure normal eye health and function.

(2) For a promising but as yet un-proven breed to be able to cope with any future rise in public popularity, thorough eye screening should be undertaken across the active breeding population – early in the breed's development rather than too late!

(3) In those breeds where skull shape, exaggerated eyelid dimensions and globe prominence may predispose to discomfort, 'dry eye' and / or the risk of ulceration, routine ACES screening would provide a basis on which to encourage moderation in the desired phenotype, as well as changing the emphasis applied in breed judging.

(\*) This breed is being well monitored on the whole. The Breed Clubs are encouraged to continue with effective screening polices, and to monitor future progress State by State.

(\*\*) This breed is being very closely monitored in general terms, but not necessarily to the same degree in every State. To be more meaningful, breeders in States where the bulk of ACES reports are generated should encourage their interstate colleagues to ask for eye exams to be conducted under AVA-ANKC Australian Canine Eye Scheme Rules.

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Group 1: Toys

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Affenpinscher	0 (0)	0 (0)						
Australian Silky Terrier	4 (1)	3 (1)				Lens suture line opacities (+ flare) - 1		
Bichon Frise	7 (11)	7 (11)					7 adults is only 1.59% of annual registrations. As for any breed with long hair coat across the face, oversized lid openings (OPF) may predispose to corneal irritation / ulceration	
Cavalier King Charles Spaniel *	152 (181)	136 (159)	<b>Multifocal Retinal Dysplasia - 3</b> (1 - Geographic, 2 - Multifocal or showing distinct immature folds. <b>Hereditary Cataract</b> - No new cases reported to Jun 2018. No further instances of <b>lenticonus / microphthalmia / cortical cataract</b> apart from one puppy presented at a Litter Screening.			Distichiasis - 8 Corneal melanosis (bilateral)* - 2 Corneal dystrophy (bilateral) - 3 <b>Palpebral fissure abnormalities (PFA) seen as elongated lid openings +/- globe prominence - 3 extreme cases reported.</b>  PFA = poor lid fit +/- excessive eyelid openings - usually assoc. with surface exposure, lid margin trichiasis and secondary pigment deposition.  * Where KCS (dry eye) is also a factor these generally advance to a dense <b>pigmentary keratitis</b> extending across one or both corneas. This often goes undetected by the owner until vision becomes obscured. <b>Two</b> cases were reported, also showing evidence of abnormal TF BUT & marginal 'dry eye'.	The number of adults submitted is slightly down on last year, at 5.95% of registrations (7.42% in 2017 and 6.6% in 2016). This breed is popular in all States and not just in the major centres, so in view of the acknowledged variety of <b>known threats to vision</b> , it would be more meaningful if this number came closer to <b>10 - 12% of registrations</b> and for that sample size to include <b>most of the current breeding stock</b> .  Efforts by CKCS Breed Clubs to conduct one-day <b>Eye and Heart Clinics</b> are a great way to encourage participation. Of this year's 152 adults, more than a hundred were seen at Breed Club sponsored Eye and Heart Clinics.  Regional Clinics staged once or twice yearly would help owners in more remote locations to ensure that retained breeding stock has been ACES screened, at least once..	<b>9 Litters, 23 pups.</b> Previous appeals seem to have been heeded, with mostly complete litters now being presented at 6 - 8 weeks of age. Obviously, Litter Screening results are more meaningful when <b>full litters are presented</b> wherever possible, before sale.  Of the 23 pups presented, 14 were reported as unaffected across five Litters. <b>MRD lesions</b> (mainly immature folds but one showing geographic lesions) were reported in <b>eight pups</b> , across three Litters.  Only one pup showed evidence of the breed-specific defect <b>lenticonus / microphthalmia / cortical cataract</b> . This is an unusual developmental anomaly, so far unique to this breed. It is not known to what extent vision is likely to be affected as these puppies grow on, and it would be worthwhile ensuring that any Lenticonus-affected pups diagnosed in a Litter Screen are then <b>re-examined after 12 - 18 months of age</b> .
Chihuahua (Long Coat)	0 (0)	0 (0)						
Chihuahua (Smooth Coat)	0 (0)	0 (0)						
Chinese Crested Dog	0 (1)	0 (1)						<b>1 Litter, 7 pups - all unaffected</b>
English Toy Terrier								
Griffon Bruxellois <sup>2</sup>	4 (4)	3 (3)				Distichiasis (extra lashes) - 1	Four adults is 1.9% of annual registrations. Adult No's screened each year need to be at least 15-20, to provide a 10% sample size. No <b>Gonioscopy tests</b> were requested this year...	
Havanese <sup>2</sup>	7 (12)	7 (11)					7 adults is 1.72% of annual registrations. This breed has no scheduled conditions yet owners are deliberately screening for a range of threatening eye conditions, as a very commendable <b>early warning strategy</b> .	
Italian Greyhound	0	0						
Japanese Chin	0	0						
King Charles Spaniel	3 (0)	3 (0)						
Lowchen <sup>2</sup>	13 (10)	13 (9)					13 adults is 52% of annual registrations (25 in 2016). GPRA is the only defect scheduled, yet owners are deliberately screening for a range of other eye conditions - as a very commendable <b>early warning strategy</b> .	
Maltese <sup>1</sup>	0	0						
Miniature Pinscher	0	0						<b>One Litter (2 pups) - both unaffected</b>
Papillon	0 (0)	0 (0)						
Pekingese <sup>3</sup>	0	0						

Group 1: Toys

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Pomeranian	0	0						
Pug <sup>1</sup>	1 (3)	0 (1)				<p><b>Corneal melanosis</b> was reported as extensive in one eye of one adult. This is more common in Pugs than is often realised, as a progressive <b>pigmentary keratitis</b> that eventually <b>obscures vision</b> in the affected eye. This animal also showed involution or in-rolling of the lower lid margin (see explanatory note in next column).</p> <p>Veterinary ophthalmologists see this vision-limiting condition much more often than most Pug owners realise!</p>	<p><b>One adult out of 1376 registered</b> in the 2016 year is a very small sample. While serious eye disease is rarely reported in Pugs, the typical conformation with thin lids trying to protect unusually prominent globes, makes them prone to in-rolling of lower eyelid margins especially medially, with the result that nasal skin fold hairs constantly rub on the cornea. This causes fine vessels and <b>melanin pigment</b> to spread WITHIN the cornea, leading to vision compromise that often goes unnoticed. <b>All adult Pugs</b> should be checked for <b>chronic pigmentary keratitis</b>, annually up to 5-6 years.</p>	<p>It is not common practice for Pug babies to present for Litter screening prior to sale, but in such a popular breed it would be a worthwhile exercise if it helped to identify features of <b>skull shape or globe prominence</b> in puppyhood - that experience has shown can predispose to exaggeration in later life. As for any brachycephalic breed, <b>moderation is the key</b> and the 'classic expression' of this breed would be no less appealing if the emphasis was shifted to a less prominent nasal skin fold and better apposition between the lower eyelid and the corneal surface.</p>
Tibetan Spaniel	0	0						
Yorkshire Terrier	0	0						
<b>Toy Group Totals</b>	<b>191 (223)</b>	<b>172 (196)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Airedale Terrier	0	0						
American Staffordshire Terrier <sup>2</sup>	0 (3)	0 (1)					ANKC breed registrations (2016) : 1793. Given levels of breeding activity both within and outside the ANKC Register, the rise in numbers of this breed cannot be ignored. Owners should monitor the eyes of all registered breeding stock, and also make sure that any <b>new imports</b> are pre-certified in the country of origin.	
Australian Terrier	2 (8)	2 (8)						
Bedlington Terrier	0	0						
Border Terrier	0 (0)	0 (0)						
Bull Terrier <sup>1</sup>	0	0					Breeders have been DNA testing for PLL but this should not be relied upon to the exclusion of routine ACES testing - adults should be screened, at least once.	
Bull Terrier Minature <sup>1</sup>	0	0					Breeders have been DNA testing for PLL but this should not be relied upon to the exclusion of routine ACES testing - adults should be screened , at least once.	
Cairn Terrier	0	0						
Cesky Terrier	0	0						
Dandie Dinmont Terrier	0 (0)	0 (0)						
Fox Terrier (Smooth)	0	0						
Fox Terrier (Wire)	0 (0)	0 (0)						
Irish Terrier	0 (0)	0 (0)						
Jack Russell Terrier <sup>2</sup>	6 (1)	6 (0)					<b>Breeders</b> have been DNA testing for PLL but this should not be relied upon to the exclusion of routine ACES testing - adults should be screened, at least once.	
Kerry Blue Terrier	0 (1)	0 (0)						
Lakeland Terrier	0	0						
Manchester Terrier	0	0						
Norfolk Terrier	0	0						
Norwich Terrier	0	0						
Parson Russell Terrier	1 (0)	1 (0)						
Scottish Terrier	0	0						
Sealyham Terrier	0	0						
Skye Terrier	0 (1)	0 (1)						

## Group 2: Terriers

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Soft Coated Wheaten Terrier <sup>2</sup>	13 (6)	13 (6)						4 Litters, 25 pups - all unaffected
Staffordshire Bull Terrier <sup>1</sup>	32 (31)	28 (26)			<b>Palpebral fissure abnormality - 0 (1)</b> Not uncommonly In juvenile dogs, the tendency for deep-set orbits with a small globe size results in unsupported lid margins, seen as lower lid entropion.	Distichiasis - 4	32 adults is a small sample - 0.66% of registrations (4873 in 2016). Breeders using the scheme as a source of useful incidence data are to be commended. Routine Litter Screening is also proving worthwhile.	19 Litters, 109 pups - of these, 16 litters (53P) showed no defects at all. <b>Distichiasis (multiple)</b> 16P , PPM 2P <b>Immature retinal folds</b> (transient?) 3P <b>One litter (10 P)</b> - numerous PHPV lesions in the vitreous, as persistent blood vessels or residual plaques.
Tenterfield Terrier	0	0						
Welsh Terrier	0	0						
West Highland White Terrier	0	0						
<b>Terrier Group Totals</b>	<b>54 (51)</b>	<b>50 (32)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Bracco Italiano	0	0						
Brittany <sup>2</sup>	0 (9)	0 (9)					Brittany Spaniels are not listed with any Scheduled conditions. The breed club(s) should advise the ACES C-P of any concerns	
Chesapeake Bay Retriever	0	0						
Clumber Spaniel <sup>3</sup>	0 (0)	0 (0)						
Cocker Spaniel (Eng.) <sup>1</sup>	0 (0)	0 (0)						
Cocker Spaniel (American) <sup>3</sup>	52 (36) gonioscopy done on 9	28 (29) unaffected on gonioscopy - 6	<b>Multifocal retinal dysplasia - 1</b>  Gonioscopy done on 9 - three of which reported as narrow angle or moderate goniodysgenesis.  <b>Goniodysgenesis is Scheduled</b> , therefore all breeding stock should have this test, at least once after 18-20 months of age.			<b>Distichiasis -3</b> (multiple lashes)	52 adults is 61.1% of annual registrations (85 in 2016); this shows that breeders are aware of this breed's vision-threatening scheduled conditions. While gonioscopy is considered a once-only test, the situation Australia-wide would be more meaningful if we could be sure that ALL breeding animals have had at least one gonioscopy test. <b>Distichiasis</b> (often with multiple lashes) is something that still needs to be watched closely.	<b>No Litters screened in 2017-18.</b> Based on previous experience and the continuing occurrence of MRD lesions in a few adults, presenting <b>American Cocker litters</b> for routine screening would tell us more about <b>juvenile retinal folds</b> as indicative evidence of MRD. Most of these resolve with maturity, flattening out to disappear entirely by 12 months.
Curly Coated Retriever	0 (0)	0 (0)						
English Setter	0	0						
English Springer Spaniel <sup>1</sup>	23 (20) gonioscopy done on 5	18 (17) unaffected on gonioscopy - 4	<b>Multifocal Retinal Dysplasia - 1</b> (reported as multiple folds)		<b>Gonioscopy testing</b> done on 5 Normal ICA angle dimensions - 4 narrow angle with mod. gonydysgenesis - 1	Two dogs with <b>extensive retinal vascular scarring</b> - probably due to early vessel haemorrhages, that forms a scar overlying the blood vessel. These may be caused by jerking on the lead as young pups, therefore it is an <b>acquired defect</b>	23 adults is slightly up on last year (4.84% of annual registrations (475 in 2016), as total registrations continue to fall away. Breeders can be proud of the very low <b>MRD incidence</b> amongst <b>locally bred stock</b> - clearly a subject that is crying out for a research study, aiming to find out why MRD lesions in our southern latitudes are much less severe than in many Northern Hemisphere countries. In this breed <b>goniodysgenesis</b> is not Scheduled but evidence is incomplete. Breed clubs need to <b>develop a policy</b> as to whether gonioscopy testing is to be encouraged, or not.	
Field Spaniel	5 (2)	5 (2)						
Flat Coat Retriever <sup>**</sup>	12 (10) gonioscopy done on 12	11 (8)	<b>Gonioscopy summary</b> (12 dogs) 11 reported Normal, 1 showed adequate angle width but mild pectinate ligament dysplasia.				9 adults is 11% of registrations (82 in 2015). Most breeders are aware of the breed's issues and appear to be ACES testing most current breeding stock and are requesting <b>gonioscopy tests</b> as well. One test is better than none, and positive selection has been shown to reduce risk for canine glaucoma.	
German Shorthaired Pointer	0 (4)	0 (3)						
German WH Pointer	0 (3)	0 (3)						
Golden Retriever <sup>**</sup>	471 (438) gonioscopy done on 29	404 (386) without a gonioscopy test; 425 when gonioscopy is included	<b>Multifocal retinal dysplasia - 4</b>	<b>Hereditary cataract (PPSC) - 10</b> Confirmed as bilaterally similar posterior polar subcapsular cataracts (mainly small). One nuclear cataract and four new cases of <b>bilateral Lenticonus</b> were reported (to be watched) <b>No PRA cases were reported</b>	<b>Summary of gonioscopy findings:</b> Gonioscopy on 29 dogs; <b>21 totally Normal</b> <b>Eight</b> adults showed significant ICA changes (fibrae latae and a few sheets) but angle width was consistently reported as good. <b>OPF + Lower lid involution / Entropion - 1</b> This occurs due to differing growth rates of the eyeball, orbit and lid margins - see the note under PFA's in Labrador Retrievers.	Distichiasis (2-3 lashes only) - 4 Corneal dystrophy (OU) - 2 Corneal lipidosis - 3 Iris coloboma - 1 Punctal atresia / tear overflow - 3 Perinuclear lens 'haloes' are often seen in fast growing young adults; this year 3 dogs had <b>perinuclear crystalline opacities</b> as well.	471 adults is 15.94% of annual registrations (2955 in 2016) which is a very high proportion especially in a breed that has the <b>highest annual submission rate</b> across all breeds.  The tendency to elongated lid margins plus secondary spastic entropion is NOT new - it is a subtle variation to be watched, in a breed with few lid apposition or growth rate issues	<b>8 Litters - 27P</b> 5 Litters (17P) - all unaffected 3 Litters (10P) - had a few with immature retinal <b>olds</b> , many of which disappear by 12 months
Gordon Setter	2 (2)	1 (1)				Dense cortical cataracts (bilateral) reported in a 9 year old - <b>acquired</b>		
Hungarian Vizsla	2 (2)	2 (2)						

**Group 3: Gundogs**

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Hungarian WH Vizsla	0	0						
Irish Red&White Setter	0	0						
Irish Setter	0	0						
Irish Water Spaniel								
Italian Spinone	0	0						
Labrador Retriever <sup>1, **</sup>	81 (129)	71 (122)	<b>Multifocal retinal dysplasia - 3</b> (2 of these - geographic lesions)	<b>Hereditary cataract (PPSC) - 2</b> Confirmed as bilaterally symmetrical posterior polar subcapsular cataracts	<b>Palpebral fissure abnormalities (OPF) - 3</b> One of these had <b>lower lid entropion</b> - i.e. involution of the outer third of the lower eyelid, with secondary spasm causing constant surface irritation + lid involution. The other two showed the reverse - with elongated lower lid margins and <b>ectropion</b>	<b>Distichiasis - 1</b> One mature adult reported with a <b>lenticonus-associated lens cataract</b> which has not been reported in Labs to my knowledge, and is of unknown inheritance significance	81 adults (well down on previous years) is only 1.6% ANKC registrations (5173 in 2016) but this does not take account of many 'pet litters' that are raised. There are no real surprises in these figures; the Scheduled conditions are all manageable, over time.  Guide Dogs South Australia presents all of its breeding adults with consistently good results, as a positive example to other States.	<b>No Litters screened in 2017-18</b>
Lagotto Romagnolo	2 (4)	2 (4)						<b>3 Litters, 21 pups:</b> all Normal
Large Munsterlander	0	0						
Nova Scotia Duck Tolling Retriever <sup>2</sup>	7 (5)	7 (5)				Chorioretinal scarring (Acq.) - 1		<b>3 Litters, 17 pups:</b> all Normal
Pointer	0	0						
Sussex Spaniel	0	0						
Weimaraner	0 (1)	0 (1)						
Weimaraner (Longhair)	0 (0)	0 (0)						
Welsh Springer Spaniel <sup>2</sup>	14 (9) gonioscopy done on 14	8 (6) incl. 8 Normal on gonioscopy	<b>Gonioscopy Summary : 14</b> Normal on gonioscopy - 8 Narrow filtration angles -2 Moderate goniodysgenesis - 2 Ext. PL dysplasia / sheets - 2			PPM (Iris to Iris only) - 3	14 adults is 12.2 % of annual registrations. This is an excellent submission rate with Gonioscopy requested on all adults. Eight of these were normal with only minor signs on the other six, which is encouraging news. It is still unclear whether narrow angles or gonodysgenesis is the more significant, but <b>selection for open ICA architecture</b> appears to support ANKC registration restrictions based on gonioscopy findings, at age 2 years	
<b>Gundog Group Totals</b>	<b>671 (672)</b>	<b>578 (619)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Afghan Hound <sup>1</sup>	4 (4)	2 (4)			Corneal dystrophy (bilat.) - 2		Nothing is Scheduled in Afghans and we know there are no significant threats to vision, but corneal opacities are noted from time to time and we have little information on heritability .	
Australian Dingo	0	0						
Basenji *	9 (16)	5 (16)	<b>No PPMs reported Iris - Cornea or iris - Lens</b>		PPM (iris to iris ) - 4 reported but not considered clinically significant. No <b>iris coloboma</b> cases reported		9 adults is down on last year (12.0 % of annual registrations (75 in 2016). PPMs are scheduled (I-C, I-L), yet the number of dogs presenting with vision-limiting opacities is now quite small.	<b>4 Litters, 20 P</b> 3 Litters - Iris to Iris PPMs only <b>1 Litter - 3 of 4 pups had Iris to Cornea PPMs + endothelial scarring</b>
Basset Fauve de Bretagne <sup>2</sup>	0 (0)	0 (0)					The fauve (fawn) Basset is a balanced mid-sized breed that has potential as a popular house pet. As for any novel breed, new imports plus all breeding stock should be systematically ACES tested until a wider gene pool of healthy-eyed animals is established.	
Basset Hound <sup>3</sup>	14 (0) Gonioscopy done on 14	11 (0) 11 reported Normal on gonioscopy	<b>Gonioscopy findings:</b> Narrow angles only - 2 Extensive dysgenesis- 1		Focal cortical cataracts - 2		It is good to see a higher submission rate once again, ALL with Gonioscopy. <b>Gonioscopy findings</b> are encouraging but more adult dogs should be assessed (at least once after 18 months) to gain a clearer picture. This breed should be monitored during growth for slack or drooping lid margins -- <b>Neat fitting, functional eyelids</b> should always be viewed as part of <b>normal eye health</b> .	<b>No Litters presented for Screening.</b> In the past gonioscopy has been requested in Basset pups at 8 weeks. It should be noted that the predictability value from gonioscopy carried out at this age has yet to be established.
Beagle	0 (1)	0 (1)					ANKC registrations average around 600 yearly. Beagle breeders seem little concerned about eye screening, hence they have no base-line figures on which to base future selection policy	
Bloodhound	1 (0)	1 (0)						
Bluetick Coonhound	0	0						
Borzoi	0	0						
Dachshund Standard Long Haired	0	0						
Dachshund Standard Smooth Haired	1 (0)	1 (0)						
Dachshund Standard Wire Haired	0	0						
Dachshund Miniature Long Haired	0 (3)	0 (3)					Breeders have access to a DNA test for PRA, but are not gathering data on other eye conditions.	
Dachshund Miniature Smooth Haired	1 (1)	1 (1)					Breeders have access to a DNA test for PRA, but are not gathering data on other eye conditions.	



Group 4: Hounds

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Dachshund Miniature Wire Haired	0	0					Breeders have access to a DNA test for PRA, but are not gathering data on other eye conditions.	
Deerhound	0	0						
Finnish Spitz	0 (1)	0 (1)						
Foxhound	0	0						
Grand Basset Griffon Vendeen	0	0						
Greyhound	0	0						
Hamiltonstovare	0	0						
Harrier	0	0						
Ibizan Hound	0	0						
Irish Wolfhound	0 (4)	0 (4)						
Norwegian Elkhound	0 (0)	0 (0)						
Otterhound	0	0						
Petit Basset Griffon Vendeen <sup>2</sup>	0 (0)	0 (0)					This versatile and highly active breed has a lot going for it, but the local gene pool remains restricted. As breed popularity grows, evidence suggests PBGV's should be <b>Gonioscopy screened</b> .	
Pharaoh Hound	0 (0)	0 (0)						
Portuguese Podengo	0	0						
Rhodesian Ridgeback <sup>1</sup>	0 (1)	0 (1)					ANKC registrations average around 650-700 yearly. Breeders seem little concerned about routine eye screening, thus they have no incidence figures on which to develop any future Policy.	
Saluki	0 (2)	0 (2)						
Sloughi	0	0						
Whippet <sup>1</sup>	0 (0)	0 (0)					With annual registrations over 700, this breed has a reputation for clear eyes and long-lasting vision. It would be good to gather data on lens and fundus abnormalities, at least as a base line.	<b>1 Litter - 5P (all Normal)</b>
<b>Hound Group Totals</b>	<b>30 (33)</b>	<b>21 (33)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Australian Cattle Dog <sup>1</sup>	0 (1)	0 (1)						
Australian Kelpie	3 (3)	3 (2)						1 Litter (3 pups) - unaffected
Australian Shepherd <sup>**</sup>	89 (88)	84 (82)	No adult CEA-CH cases were reported; No MRD or <i>prcd</i> PRA	Anterior subcapsular cataract - 1 (mid-axial and unilateral, typical of early blunt injury) : <b>acquired</b>		<b>Distichiasis - 4</b>	89 adults is 10.69% of annual registrations (832 in 2016, stable). This breed is enjoying increased acceptance in rural communities and CEA appears no longer a big threat. Lid margin <b>distichiasis</b> should be watched, along with <b>corneal lipid deposition</b> and <b>Iris colobomata</b> although none were reported this year.	<b>33 Litters (206 pups)</b> <b>26 Litters (151 pups)</b> reported <b>ALL unaffected</b> <b>Distichiasis</b> (2-3 fine lashes only) - 2 pups Nuclear lens cataracts (bilateral) - 1 pup <b>A few imature retinal folds (MRD?)</b> - 3 pups (All considred likely to resolve with time) Lacrimal punctal atresia (?) - 1 pup
Australian Stumpy Tail Cattle Dog	0 (2)	0 (2)						
Bearded Collie	0 (0)	0 (0)						
Bergamasco Shepherd Dog	1 (0)	1 (0)						
Belgian Shepherd Dog (Groenendael) *	5 (11)	5 (11)		There were NO lens cataracts of the PPSC type reported in the current year, but the number of breeding age adults submitted is too low to be a reliable sample			Allowing for low numbers to be expected in Malinois and Lakenois, numbers in the more popular Varieties (Groenendael & Tervueren) have dropped back somewhat this year. Only one <b>PPSC cataract</b> was reported, but that is hard to interpret with such low numbers of breeding age adults being examined annually  Breed Clubs should encourage regular ACES screening of all breeding age adults (across all four varieties) <b>until around 5-6 years of age.</b>	
Belgian Shepherd Dog (Laekenois)	1 (0)	1 (0)						
Belgian Shepherd Dog (Malinois)	1 (1)	1 (1)						
Belgian Shepherd Dog (Tervueren) *	8 (23)	7 (18)		Hereditary cataract (PPSC type) - 1				
Border Collie <sup>1, *</sup>	36 (50) gonioscopy done on 30	32 (43) incl. gonio 27 excl. gonio 5	No CEA - CH cases reported	No PLL cases reported	<b>Gonioscopy Summary :</b> Gonioscopy carried out on <b>30 dogs</b> -  75-100% ICA Open (Normal) - 27 Goniodysgenesis (50-60% Open) - 2 (angle width not reduced) Narrow filtration angle + PLD - 1  <b>Optic Nerve head hypoplasia - 1</b>		<b>36 adults is only 1.21 % of annual registrations</b> (2973 in 2016, with many litters bred in rural areas where ACES screening is often difficult to access). CEA-CH cases are almost unheard of, so if owners are all now avoiding the carrier genotype with <b>routine DNA testing</b> , this looks good for the breed as well. The proportion reported <b>Normal on Gonioscopy</b> is also very encouraging, with a clear separation shown year by year, between 'open / functional' and 'compromised' <b>iridocorneal angle</b> parameters.  The National Border Collie Council could now consider setting a <b>threshold gonioscopy result</b> to be met by both parents of any registered litter, as a justifiable basis for restricting Litter Registrations This would require an <b>ANKC Breed Survey</b> of all Breed Club members.	<b>4 Litters, 15 pups</b> - all unaffected
Bouvier Des Flandres	0 (1)	0 (1)						
Briard	0	0						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Collie - Rough <sup>1</sup>	8 (11)	1 (2)	Collie Eye Anomaly signs - 6 Choroidal hypoplasia only - 6			Distichiasis (multiple) - 1	<p>Only 8 adults? This is a far from adequate sample, to provide sufficient information on vision defects in the adult population (290 in 2016). The detailed summary of Litter Screening results should be carefully studied by every breeder because sadly, <b>blind puppies</b> (due to induced haemorrhage or retinal detachment) are still being picked up, year by year.</p> <p>Is this at all surprising, given the reluctance among breeders in most States to apply any <b>nationally-coordinated selection pressure</b> against the now well-entrenched CEA-CH gene?</p>	<p><b>36 Litters, 146 pups in total</b> Only 4 Litters (11P) - whole litter unaffected 18 Litters (76 P) : one or more with CH only 7 Litters (29 P) multiple with CH + coloboma 4 Litters (26P) detached retinas + coloboma 3 Litters (4P) had <b>sub-retinal haemorrhages</b> affecting vision in <b>one or both eyes</b></p> <p>It should be clearly understood that any pup with bilateral detachments or signs of continuing haemorrhage in one or both eyes, has to be regarded as <b>permanently blind</b> and any intending purchaser should be made aware of that as a lasting defect.</p>
Collie - Smooth <sup>1</sup>	0 (0)	0 (0)						<p><b>4 Litters, 20 pups (MIXED Rough / Smooth)</b> All 20 pups - <b>choroidal hypoplasia</b> affected, plus 2 colobomas + 3 detached retinas</p>
Finnish Lapphund <sup>2, **</sup>	42 (48) Gonioscopy on 2	41 (47) (incl. 2 N. on Gonioscopy)	Lens cataract (PPSC type) - 1				<p><b>42 adults was 22.0 % of registrations</b> in 2016 and this seems to be representative. For a newly introduced breed, owners are doing the right thing, screening all current breeding stock</p>	<p><b>6 Litters, 32 pups</b> 31 pups reported as unaffected, with one litter also screened (N) by gonioscopy. PPM (Iris to Cornea) - 1 P</p>
German Shepherd Dog (SC: normal coat)	0 (0)	0 (0)					<p>ANKC registrations average 4,000 yearly. For what is arguably our most self-regulated breed, German Shepherd owners seem little concerned about routine eye screening, hence they have NO base-line incidence figures from which to develop future Policy.</p>	
German Shepherd Dog (LSC: long coat)	0 (0)	0 (0)						
Komondor	0	0						
Kuvasz	0	0						
Maremma Sheepdog	0 (0)	0 (0)						
Norwegian Buhund	0	0						
Old English Sheepdog	9 (4)	9 (4)						
Polish Lowland Sheepdog	0	0						
Puli <sup>2</sup>	0 (2)	0 (2)						<p><b>1 Litter, 8 pups</b> - all unaffected</p>
Shetland Sheepdog <sup>1, *</sup>	8 (9)	7 (4)	Collie Eye Anomaly - CH - 1 Choroidal hypoplasia only - 0 CEA - CH plus coloboma - 1				<p><b>8 adults is 1.28% of annual registrations</b> (623 in 2016). Many owners are still neglecting to follow up on an <b>adult dog's eye status</b> after it was reported 'CEA-CH unaffected' as a puppy. It is important to examine ALL breeding-age adults at least once after 18 months of age in order to confirm the early Litter Screening result and to pick up any <b>other</b> significant eye defects..</p> <p>Good progress is being made in reducing the numbers of CEA-CH affected animals, but more could be achieved if the DNA test was used NOT as an alternative, but as <b>worthwhile additional information after regular ACES testing.</b></p>	<p><b>72 Litters, 257 pups</b> 52 Litters (174 P) - all unaffected 15 Litters (69 P) - 1 or &gt; with CH bilaterally 5 Litters (24 P) - CH + colobomas 1 or 2 eyes <b>NO CEA retinal detachment or haemorrhages</b> Nuclear cataract - 2, Corneal dystrophy - 2</p> <p>While the number of Litters submitted is maintaining and the proportion of good results is also improving (75-80% of pups being unaffected), the periodic reports of severe signs (incl. blindness) shows that pressure needs to be applied to <b>reduce the CEA-CH gene frequency</b> with each generation</p>
Swedish Lapphund	0	0						
Swedish Vallhund	0 (1)	0 (1)						

Group 5: Working Dogs

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Welsh Corgi (Cardigan) †	0	0						
Welsh Corgi (Pembroke) †	7 (2)	7 (2)					While serious eye conditions are rare in this breed, all breeding age adults should have at least one ACES exam after 18 months to pick up lens cataracts or other hidden eye defects	
White Swiss Shepherd Dog †	0 (10)	0 (8)					All breeding stock in this numerically small breed should be screened annually for the next few years. If ON hypoplasia continues to be detected in Litters and a few adult dogs, this needs to be followed up in an organised way, to eliminate any congenital threat to vision.	<b>1 Litter, 8 pups</b> - all unaffected No new cases of optic nerve hypoplasia
<b>Working Group Totals</b>	<b>218 (267)</b>	<b>198 (229)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Akita	0 (5)	0 (4)						<b>No Litters presented in 2017-18.</b> Given the coinciding drop-off in adult ACES exams also, it appears that the concern expressed last year for repeating instances of microphthalmia (very small, under-developed eyeballs) with lens cataracts may have frightened owners off! Those cases could have resulted from an acquired cause, which can only be confirmed if more Litters are screened.
Akita (Japanese)	1 (0)	1 (0)						
Alaskan Malamute	4 (4) Gonioscopy on 1	4 (4)			<b>Gonioscopy summary :</b> One adult tested showed mild pectinate ligament dysplasia only - ICA 75% Open		<b>Four adults is 1.93 % annual registrations</b> To date Gonioscopy testing has not revealed significant angle compromise	
Anatolian Shepherd Dog	0	0						
Bernese Mtn. Dog	2 (10)	1 (10)				Lateral lower lid entropion - 1 (unilat.)		
Boxer	2 (0)	1 (0)				<b>Distichiasis (multiple) - 1</b>		
Bullmastiff <sup>3</sup>	1 (0)	0 (0)			<b>PPM (Iris to Cornea &amp; Iris to Iris) - 1</b>			
Dobermann	0	0						
Dogue de Bordeaux <sup>3</sup>	0	0						
German Pinscher	1 (1)	1 (1)					This breed has nothing scheduled. Breeders need to notify ACES Panel of any particular concerns	
Leonberger <sup>**</sup>	11 (3) Gonioscopy on 2	9 (3)			<b>Gonioscopy summary :</b> Normal angle width & trabeculae (100% Open) - 1 > angle width, some PLD (60% Open) - 1	Palpebral fissure anomaly - 1 (slack, loose fitting eyelids) <b>PPM (Iris to Cornea) - 1</b>	This breed has a growing following - as far as possible breeding stock should be screened to report Scheduled conditions	
Mastiff <sup>3</sup>	0	0						<b>1 litter, 3 pups</b> <b>3 pups</b> showed residual PPM strands (iris to cornea); <b>1 pup - MRD lesion OD</b>
Neapolitan Mastiff <sup>3</sup>	1 (0)	0 (0)				Palpebral fissure anomaly (loose fitting lower lids) + medial strabismus - 1		
Newfoundland	0	0						
Portuguese Water Dog	4 (0)	4 (0)						<b>1 Litter, 9 pups :</b> Juvenile retinal folds (4)
Pyrenean Mtn. Dog	0 (3)	0 (3)						
Rottweiler <sup>1</sup>	0 (1)	0 (1)						
Russian Black Terrier	0	0						
Samoyed <sup>**</sup>	43 (63) gonioscopy done on 40	35 (40) incl 32 N on gonioscopy			<b>Gonioscopy summary:</b> <b>Iridocorneal angle 80 -100% open - 32</b> By any measure, these dogs are Normal  Iridocorneal angle 60-75% open - 2 (normal width, some PLD, few sheets) Iridocorneal angle 30-50% open - 2 (normal width, few fibrae latae & sheets) <b>Extreme angle reduction</b> with marked gondysgenesis and few flow holes - 4	<b>Distichiasis - 2</b> Corneal dystrophy (bilat.) - 2 No new cases of PPSC-type lens opacity	Adult numbers seen Australia-wide are maintaining well (Gonioscopy included). The Gonioscopy breakdown again shows a distinction between 'wide open' and 'severely compromised' filtration angle parameters, with the majority of mature adults surveyed revealing convincing evidence for <b>normal outflow capacity</b> .  The National Samoyed Council should now consider introducing a registration restrictions policy, with help from ANKC <b>Canine Health &amp; Wellbeing Committee</b> to conduct a nationwide <b>ANKC Breed Survey</b> - to canvas all members' views.	<b>15 Litters, 73 pups</b> <b>60 pups</b> reported as unaffected, including 21 where gonioscopy was offered at 8 weeks. All of these gonioscopy exams showed 80-100% open angles with no sheet formation - but the predictability value at this age is yet to be established.  Optic nerve head coloboma - 1 <b>Retinal MRD lesions with giant folds - 1</b>
Schnauzer - Giant	1 (4)	1 (4)				1 - hyaloid remnant scars, not significant		

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Schnauzer - Standard	0 (2)	0 (2)						
Schnauzer -Miniature **	166 (128)	157 (120)	<b>Congenital HC - 1</b> (early onset)	(No PRA Cases reported)		<b>Distichiasis - 7</b> Corneal lipidosis / degen. (unilat.) - 1 Chorioretinal scars ( cause uncertain) - 2	166 adults is 9.4 % annual registrations (1765 in 2016). Clearly the majority of breeders see benefits in monitoring both adults and litters, evident in the reduction in <b>inherited cataract</b> cases. These are very commendable results!	<b>22 Litters, 100 pups</b> Almost all pups reported as unaffected, apart from one with a single errant lash (distichia) and one with microphthalmia
Shiba Inu	12 (1) Gonioscopy on 4	12 (1)			<b>Gonioscopy summary :</b> Angle widths normal, ICA 100% Open - 4			
Siberian Husky **	60 (49) gonioscopy done on 47	53 (41) 40 N on gonioscopy		<b>Hereditary cataract - 2</b> (PPSC type)	<b>Gonioscopy summary :</b> More than three quarters of dogs tested were reported as 'Gonioscopy Normal' or were given a Panellist's estimate of ICA outflow caacity at approx. 80-100% Open. <b>Four dogs</b> reported as 60-75% Open, with some fibrae latae (PLD) noted. <b>Three</b> showed <b>narrowing of the filtration angle</b> as the only variation (all heterochromes*)		<b>Angle narrowing</b> in heterochromic (blue) eyes is a common finding in this breed. An <b>organised study</b> would show whether blue-eyed dogs (*) are in fact 'outflow compromised' or whether the 'blue eye' iris plane across the cleft entrance just <i>presents differently</i> in a gonioscopy test. In the absece of a National Siberian Husky Breed Council, the <b>breed clubs</b> should be thinking about what action if any, they want to take so that members can better understand the many issues around gonioscopy and glaucoma risk.	
Saint Bernard	0	0						
Tibetan Mastiff	0	0						
<b>Utility Group Totals</b>	<b>309 (274)</b>	<b>279 (234)</b>						

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Boston Terrier <sup>1</sup>	8 (4)	5 (3)		Hereditary cataract - 1 (full cortex opacity)		lacrimal punctal atresia - 2 (ie. either constricted or absent)		1 Litter (1P) - normal
British Bulldog <sup>1</sup>	0	0						
Canaan Dog	0	0						
Chow Chow <sup>1</sup>	16 (0)	7 (0)			PPMs (Iris - Cornea and iris - Lens) - 4	A repeating tendency to lid margin involution is noted - inv. the lower lids & lateral canthus		2 Litters (5P) 3 pups in one litter and 1 pup in the other all showed Iris to Cornea PPMs
Dalmatian	1 (0)	1 (0)						
Eurasier	0	0						
French Bulldog <sup>2, 3</sup>	0 (2)	0 (2)					This breed is seeing a continued surge in popularity. Few eye problems are reported but large, bulbous eyes <b>must predispose</b> to tear film break-up and a higher risk of corneal ulcers or injury. <b>Moderation is the key</b> and extremes should be avoided. Why not consider screening all breeding age adults for obvious lid margin or apposition defects?	<b>No Litters presented in 2017-18.</b> This newly popular breed is virtually unmonitored in regard to potentially threatening eye conditions. Breeders should at least be trying to avoid any dry eye tendency, also elongated lid openings (palpebral fissure length).
German Spitz: Klein	0	0						
German Spitz: Mittel	1 (11)	1 (11)						1 Litter (5P) - normal
Great Dane	6 (5) gonioscopy done on 5	5 (5)			Gonioscopy results : Open angles / normal on gonioscopy - 4 Narrow Iridocorneal angle with sheets - 1		Numbers being bred remain static in this magnificent breed but this makes it all the more important to aim for structural soundness and a healthy conformation. This also applies to <b>normal eye function</b> and so any tendency to long or ill-fitting lid margins is something to be watched.	
Japanese Spitz	1 (1)	1 (1)						
Keeshond	0	0						
Lhasa Apso <sup>3</sup>	0 (1)	0 (1)						
Poodle - Standard <sup>1</sup>	5 (3) gonioscopy done on 0	5 (3)					While five is still a small sample, we do not expect major issues in Standard Poodles. As yet there is no uniform policy on the need for gonioscopy	
Poodle - Miniature <sup>1</sup>	1 (3)	1 (3)						
Poodle - Toy <sup>1</sup>	4 (9)	4 (6)	No new reports of Optic Nerve Head hypoplasia					
Schipperke	0	0						

### Group 7: Non Sporting

Breed	Total to date	Unaffected	Schedule (Congenital)	Schedule (Later Onset)	Non Schedule (Congenital)	Non Schedule (Later Onset)	Breed Notes	Litter Screening summarised
Shar Pei <sup>3</sup>	0	0					Litter registrations have stabilised (193 in 2016) but a zero ACES uptake is very disappointing. Given the number of pups requiring 'tacking' and juveniles presenting with spastic entropion for facial skin excisions later (to be able to see, free of constant pain), one would expect to see Breed Clubs insisting on only <b>moderate degrees</b> of wrinkling!	
Shih Tzu <sup>3</sup>	0	0						
Tibetan Terrier <sup>2</sup>	13 (4)	12 (4)				Early onset cortical cataract - 1 (likely to be congenital in origin)	A breed with potential as a compact and intelligent family pet - with very few eye problems seen so far. <b>PLL and PRA</b> have been reported overseas and both can be screened genetically, but in this heavily coated breed it is important to be alert to a number of other possible threats to healthy eyes and vision.	
<b>Non Sporting Group Totals</b>	<b>56 (43)</b>	<b>42 (39)</b>						
<b>All Breeds Totals</b>	<b>1529 (1563)</b>	<b>1340 (1382)</b>			<b>Please Note : the bracketed figures in red alongside each breed's annual totals is the figure for the same period LAST YEAR.</b>			