PREVENTION OF CRUELTY TO ANIMALS ACT

CODE OF PRACTICE FOR THE RESPONSIBLE BREEDING OF ANIMALS WITH HERITABLE DISEASE

14 Jan 2008

CONSULTATION DRAFT

This Consultation Draft has been prepared for the Government by the Bureau of Animal Welfare (DPI) and presented to DOGS Victoria for comment.

All responses from affiliate clubs or individuals should be forwarded to the Chief Executive of DOGS Victoria by 20 March 2008.

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1. Preface

The *Prevention of Cruelty to Animals Act 1986* came into force on 20 May 1986 and is administered by the Department of Primary Industries. It has the purpose of protecting animals, encouraging the considerate treatment of animals and improving the level of community awareness about the prevention of cruelty to animals.

It establishes fundamental obligations relating to the care of animals in general terms. Details of obligations are found in codes of practice that are made under the provisions of the Act. These set out minimum standards and recommendations relating to important aspects of the care of animals. They are developed following a process of consultation with stakeholders and the community.

Codes reflect the views and values held by most Victorians with respect to the care of animals.

This code was initiated by the Bureau of Animal Welfare and prepared in consultation with an advisory committee. This committee was comprised of persons who have knowledge and expertise in animal welfare, veterinary science, the commercial use and breeding of animals and the testing, diagnosis and control of heritable diseases in animals.

2. Purpose of the code

This Code is made under the provisions of the Prevention of Cruelty to Animals Act 1986. The Code and its provisions are to be observed by owners, carers and custodians of animals used for breeding that are affected by heritable disease or that carry heritable genetic defects that could cause heritable disease in progeny caused by inappropriate selection and mating of animals with these defects.

This Code of Practice reflects current knowledge and opinion and provides standards and recommendations for the breeding of animals with the heritable diseases prescribed in the Act. It also outlines principles for the consideration of persons breeding animals with heritable defects not listed in the Act.

A person breeding animals in a program approved by the approved organisation for that species of animal is not considered to be breeding animals recklessly or intentionally as defined in Section 15C(1) of the Prevention of Cruelty to Animals Act 1986.

3. Background

Heritable diseases are grouped by ***the severity of the condition they cause.*** This Code of Practice permits use of valuable breeding stock while restricting the numbers of animals being sold or offered to the general public that are at risk of developing severely debilitating or crippling heritable disease.

The groupings provide a systematic outline by which simple autosomal inherited defects in animals may be categorized to enable the long term risks to be quantified and dealt with in a uniform manner, irrespective of the system or metabolic pathway that is affected in any particular breed or type or species of animal.

Heritable conditions can be broken up into several broad groups:

3.1 Dominant diseases where the heterozygous and homozygous states for the defective gene have the disease. Includes dominant conditions with variable expression or penetrance, and some sex-linked conditions.

: Cats
Polycystic Kidney Disease
Folded ears associated with osteochondrodystrophy

:Dogs
Progressive Retinal Atrophy (In those breeds where dominant inheritance has been scientifically established)
Hereditary cataract (in those breeds where dominant inheritance has been scientifically established)

3.2 Simple recessive diseases that result in severe signs of disease in the homozygous condition.

:Cats
Aplasia or hypoplasia of long bones

:Dogs
Neuronal Ceroid Lipofuscinosis
Von Willebrand's Disease type III

3.3 Simple recessive diseases that may take years to develop signs of the disease

Dogs:
Progressive Retinal Atrophy (in those breeds affected by the *prcd* form, also *rcd 1,2,3)*
Hereditary Cataract (in breeds where a simple recessive mode has been scientifically established)

3.4 Simple recessive diseases that are sex linked or show weak penetrance and limited expression of the disease resulting in only a few affected individuals.
While the following diseases are not listed in the Schedule of the Act some examples of this grouping are Haemophilia A, X-linked PRA type 1, X-linked PRA type 2 (described in crossbred dogs) and goniodysgenesis as an established risk factor for canine glaucoma

3.5 Simple recessive diseases that are also dependant on over-riding or modifying genetic effects for full expression, before they pose a threat as a debilitating condition. This includes conditions where the vast majority of genetically affected individuals fail to exhibit the full range of clinical signs unless modifying factors are present – factors that directly influence the degree to which the disease is ultimately expressed

Dogs:
Collie Eye Anomaly (where they are adversely affected by choroidal hypoplasia, coloboma and retinal detachment as part of the Collie Eye Anomaly disease)
Von Willebrand's Disease type 1 & 2

3.6 Polygenic disease – where more than one gene is involved and environmental effects can add to the severity of the condition.
While the following diseases are not listed in the Schedule of the Act examples of diseases in this grouping that have widely divergent signs are hip dysplasia and elbow dysplasia. These are also conditions where simple and/or effective DNA tests are unlikely to be developed.

3.7 Recognised inherited diseases that produce significant potential health risks in small numbers of affected individuals, but where there is no advance warning mechanism offered through the early onset of signs or the availability of a reliable genetic test, able to predict the development of debilitating disease in later life**.**

Dogs:
Hereditary Cataract (where late onset is characteristic of the condition)

4 Prevention of Cruelty to Animals Act Schedule amendments - process

Recommendations to the Minister to amend Schedule 2 of the Act requires consultation with **veterinary specialists**, **geneticists** and **breeders** of the species as recommended by their respective professional bodies and associations of members.

Diseases to be listed should -

i. Be established, well-researched inherited diseases or defects known to be present in a local breed population (or likely to be imported from overseas)
ii. Have sufficient researched information to allow the condition to be correctly diagnosed and categorized, and be able to be tested for cost-effectively.

In making a recommendation to the Minister the following information must be provided -

i. The severity of the end disease
ii. The mode of inheritance (dominant, simple recessive etc) and allocated to a Heritable Disease Group for the purposes of this code.
iii. The proportion of 'affected' : 'carrier' : 'clear' individuals within the breed.
iv. The number of diseases being simultaneously tested/screened within a breed.
v. Ease of access to a range of reliable and repeatable screening methods.
vi. There should be a reliable test to diagnose the disease that is cost effective for an approved breeding program.

Where the number of affected individuals is very low, few affected animals will be bred from nor are needed in the gene pool for the breed. As the percentage of affected and carriers increases, more time will be needed to manage the risk of producing affected individuals, so that other pressures present in any 'closed' population do not force the emergence of hitherto hidden diseases, as a result of disproportionate restrictions to the existing gene pool.

The more diseases being tested for or screened, the slower the overall progress will be in a breeding program. Some individuals may be shown to be genetically clear for one or two conditions under test, yet be affected in a third, perhaps milder condition.

Screening methods are usually DNA tests. Some conditions require additional screening as required by an approved organisation eg. CEA requires an ACES Panellist examination before eight weeks of age.

5 Definitions

"Approved Organisation": for any species is an organisation approved by reference in this Code of Practice in Section 8.

Approved collection officers – breed association designated collection officers whereby samples are collected for DNA testing at shows or specific testing days or a veterinary practitioner.

"Veterinary practitioner": means a registered veterinary practitioner

"Affected" refers to the homozygous affected state, where the animal in question is abnormal in both phenotype and genotype.

"Clear" refers to the homozygous unaffected state, where the animal in question is normal in both phenotype and genotype.

"Collie Eye Anomaly" - a complex of potentially blinding congenital eye defects, of which choroidal hypoplasia is the simplest and least threatening to vision, and the only one currently detectable on a DNA test

"Carrier" refers to the heterozygous unaffected state, where the animal in question is normal in phenotype but abnormal in genotype for simple autosomal recessive conditions. With dominant autosomal conditions the carrier state is affected.

"Unknown" refers to an animal of a breed or cross-breed that is known to be at risk from the condition and the animal has not been examined for it. There is reason to suspect the animal for the condition due to diagnoses in the progeny or parents.

6 Legal responsibilities

The Prevention of Cruelty to Animals Act 1986 sets out offences for intentionally or recklessly breeding a species of animal with a heritable disease as listed in Schedule 2 of the Act. It is an offence for a person to sell or dispose of an animal with that heritable disease without giving advice to the new owner that the animal has the disease.

7 Heritable disease groups

7.1 Heritable disease caused by a simple <u>dominant</u> defective gene

Carrier (is affected) = heterozygote (ie. 1 clear gene and 1 defective gene), displays degrees of disease
Affected= homozygous for heritable defect genes (ie 2 defective genes) displays severe form of disease
Clear = homozygous for clear genes (ie. 2 clear genes) and is free of the disease

: Cats
Polycystic Kidney Disease

Folded ears associated with osteochondrodystrophy

:Dogs
Progressive Retinal Atrophy (In those breeds where dominant inheritance has been scientifically established)

Hereditary cataract (in those breeds where dominant inheritance has been scientifically established)

Parent combination	**Theoretical status of progeny**	**Heritable disease requirements**
Clear x Clear	100% Clear	No restriction
Clear x Carrier (& Clear x Unknown)	** 50 % Clear 50 % Carrier (that may be affected to some degree)	1. All progeny should be DNA tested for the heritable disease by an approved collection officer. 2. The degree of disease in carrier animals should be assessed by a veterinary practitioner and the animal managed in

		accordance with the instructions of a veterinary practitioner. 3. Carrier animals must not be disposed of to another person without advice of the animals heritable disease status 4. Carriers should be de-sexed prior to sale unless to be used in an aproved breeding program
Carrier x carrier (&Carrier x Unknown)	** 25% Clear 50% Carrier (is affected to some degree) 25% Affected (usually seriously)	1. **Prohibited unless** as part of a planned long term breeding program approved by an approved organisation listed in this code for the type of animal. 2. All progeny must be DNA tested for the heritable disease by an approved collection officer 3. Records of carrier and affected progeny must be marked with their test status 4. The severity of disease in carrier animals must be assessed by a veterinary practitioner and the animal managed in accordance with the instructions of a veterinary practitioner. 5. Carrier and affected animals must not be disposed of to another person without advice of the animals heritable disease status. 6. If kept alive affected animals must be de-sexed prior to disposal, must not be permitted to suffer from their condition by their owner and must be under the supervision and monitoring of a veterinary practitioner.
Affected x Clear	100% Carrier (all will have a degree of the disease)	1. **Prohibited unless** as part of a planned long term breeding program approved an approved organisation listed in this code for the type of animal. 2. Records of progeny must be marked as carrier status unless otherwise certified by a veterinary practitioner 3. The degree of disease in carrier animals must be assessed by a veterinary practitioner and the animal managed in accordance with the instructions of a veterinary practitioner. 4. Carrier animals must not be disposed of to another person without advice of the animals heritable disease status 5. All progeny not being used in a breeding program must be de-sexed.
Affected x Carrier	50% carrier , 50% Affected(all be	**1. Prohibited** 2. Intentional or reckless use of this

& Affected by Affected	affected to some degree) 100% Affected(usually seriously)	combination is an offence under the Act. **3.** If kept alive affected progeny must be de-sexed prior to disposal, must not be permitted to suffer from their condition by the owner and must be under the supervision and monitoring of a veterinary practitioner.
Unknown X Unknown		1. **Prohibited unless** all progeny are tested for the heritable disease by an approved collection officer 2. Records of carrier and affected progeny must be marked with their status 3. This is considered reckless breeding in view of the definition of 'unknown'

**Testing is preferred as in practice the unpredictable nature of the process of gene inheritance in these combinations may cause variation in the actual % outcomes per generation. As carriers may express varying degrees of the heritable disease they must be tested, assessed and monitored by a veterinary practitioner experienced with the disease to determine the impact on the animal.

Carrier and affected animals should be de-sexed if not to be used in a breeding program.

7.2 Heritable disease caused by a simple recessive defective gene resulting in severe disease

Carrier = heterozygote (ie. 1 clear gene and 1 defective gene) and does not exhibit the disease
Affected= homozygous for heritable defect genes (ie, 2 defective genes) and is affected by the disease
Clear = homozygous for clear genes (ie. 2 clear genes) and is free of the disease

:Cats
Aplasia or hypoplasia of long bones

:Dogs
Neuronal Ceroid Lipofuscinosis (CL)

Von Willebrand's disease Type III

Parent combination	**Theoretical status of progeny**	**Heritable disease requirements**
Clear x Clear	100% Clear	No restriction
Carrier x Clear (& Clear x Unknown)	** 50 % Clear 50 % Carrier	1. All progeny will be unaffected by the disease 2. All progeny to be used for ***breeding purposes*** must be DNA tested for the heritable disease by an approved collector officer prior to use in a breeding program. 3. Records of carrier progeny must be marked with their status. 4. Carrier animals that are not to be used for breeding purposes should be desexed.

Carrier x Carrier	** 25% Clear 50% Carrier 25% Affected	1. **Not recommended.** Must only occur as part of a planned long term breeding program approved by an approved organisation listed in this code for the type of animal. 2. All resultant progeny must be DNA tested for the heritable disease by an approved collection officer. 3. Records of carrier and affected progeny must be marked with their test status. 4. Affected animals must not be disposed of to another person without advice of the animal's heritable disease status. 5. If kept alive affected progeny must be de-sexed prior to disposal, must not be permitted to suffer from their condition by their owner and must be under the supervision, advice and monitoring of a veterinary practitioner.
Carrier x unknown status	Outcome may be one of the above two options depending on the status of the untested parent	1. **Not recommended**. All progeny must be tested for the heritable disease by an approved collection officer. 2. Records of carrier and affected progeny must be marked with their status.
Affected x Clear	100% Carrier	1. **Not recommended.** Must only occur as part of a planned long term breeding program approved an approved organisation listed in this code for the type of animal. 2. Records of progeny must be marked with carrier status.
Affected x Carrier Affected x Affected	50% Carrier 50% Affected 100% Affected	**1. Prohibited** 2. Intentional or reckless use of this combination is an offence under the Act. 3. Affected animals must not be disposed of to another person of to another person without advice of the animal's heritable disease status 4. If kept alive affected progeny must be de-sexed prior to disposal, must not be permitted to suffer from their condition by the owner and must be under the supervision and monitoring of a veterinary practitioner.
Unknown X Unknown		**1. Prohibited unless** all progeny are tested for the heritable disease by an approved collection officer **2.** Records of carrier and affected progeny must be marked with their status

**Testing is required as in practice the unpredictable nature of the process of gene inheritance in these combinations may cause variation in the actual % outcomes per generation.

Carrier animals should be de-sexed if not to be used in a breeding program.
Affected animals must be de-sexed if not to be used in a breeding program.

7.3 Heritable disease caused by simple recessive gene that may take years to develop symptoms of the disease

Dogs:
Progressive Retinal Atrophy (in those breeds affected by the *pcrd* form, also *rcd 1,2,3)*

Hereditary Cataract (in breeds where a simple recessive mode has been scientifically established).

Parent combination	**Theoretical status of progeny**	**Heritable disease requirements**
Clear x Clear	100% Clear	No restriction
Clear x Carrier Clear x Unknown	50 % Clear 50 % Carrier	1. All progeny will be unaffected by the disease. 2. Any progeny that is to be used for ***breeding purposes*** should be DNA tested for the heritable disease by an approved collection officer. prior to sale or use in a breeding program (which ever occurs first) 3. Records of tested progeny must be marked with their DNA status.
Carrier x Carrier	** 25% Clear 50% Carrier 25% Affected	a. **Not recommended**. Must only occur as part of a planned long term breeding program approved an approved organisation listed in this code for the type of animal. b. All resultant progeny must be DNA tested for the heritable disease by an approved collection officer. c. Records of carrier and affected progeny must be marked with their test status. d. Affected animals must not be disposed of to another person without advice of the animal's heritable disease status. e. If kept alive, ***affected*** progeny (or any juvenile offspring confirmed as 'Affected' on genetic test) should be de-sexed prior to disposal, must not be permitted to suffer from their condition by their owner and must be under the supervision, advice and monitoring of a veterinary practitioner.
Carrier x unknown status	Outcome may be one of the above two options depending status of untested parent	1. Not recommended unless all progeny are tested for the heritable disease by an approved collection officer. 2. Records of carrier progeny must be

		marked with their status.
Affected x Clear	100% Carrier	a. **Not recommended**. Should only occur as part of a planned long term breeding program approved by an approved organisation listed in this code for the type of animal. b. Records of resultant progeny must be marked with carrier status.
Affected x Carrier Affected x Affected	50% Carrier 50% Affected 100% Affected	**1. Prohibited** 2. Intentional or reckless use of this combination is an offence under the Act. 3. Affected animals must not be disposed of to another person of to another person without advice of the animal's heritable disease status **4.** If kept alive affected progeny must be de-sexed prior to disposal, must not be permitted to suffer from their condition by the owner and must be under the supervision and monitoring of a veterinary practitioner.
Unknown X Unknown		**1. Prohibited unless** all progeny are tested for the heritable disease by an approved collection officer. **2.** Records of carrier and affected progeny must be marked with their status

**Testing is required as in practice the unpredictable nature of the process of gene inheritance in these combinations may cause the actual % outcomes per generation to vary from the theoretical outcomes.

Carrier and affected animals should be de-sexed if not to be used in a breeding program.

7.4 Heritable disease caused by simple recessive genes that are sex linked (or show weak penetrance or limited expression resulting in only a few affected individuals)

See section 3.4.

7.5 Heritable disease caused by a simple recessive defective gene that is dependant on over-riding or modifying genetic effects for full expression of disease.

This includes conditions where the vast majority of genetically affected individuals do not exhibit the full range of clinical signs of the disease unless modifying factors are present - factors that directly influence the degree to which the disease is ultimately expressed

Dogs:

Collie Eye Anomaly

Von Willebrand's Disease type 1 & 2

Parent combination	Theoretical status of progeny	Heritable disease requirements
Clear x Clear	100% Clear	No restriction
Clear x Carrier (& Clear x Unknown)	50 % Clear 50 % Carrier	1. All progeny will be unaffected by the disease. 2. Any progeny that is to be used for ***breeding purposes*** should be DNA tested for the heritable disease by an approved collection officer prior to sale or use in a breeding program (which ever occurs first) 3. Records of tested progeny must be marked with their DNA status.
Carrier x Carrier	** 25% Clear 50% Carrier 25% Affected	1. Should only occur as part of a planned long term breeding program approved by an approved organisation listed in this code for the type of animal. 2. All resultant progeny should be DNA tested for the heritable disease by an approved collection officer 3. Records of carrier and affected progeny must be marked with their test status 4. Affected animals must not be disposed of to another person without advice of the animal's heritable disease status 5. If kept alive, adversely ***affected*** animals should be de-sexed, must not be permitted to suffer from their condition by their owner and must be under the supervision, advice and monitoring of a veterinary practitioner.
Carrier x unknown status	Outcome may be one of the above two options depending status of untested parent	1. All progeny should be tested for the heritable disease by an approved collection officer 2. Records of carrier progeny must be marked with their status. 3. Affected animals must not be disposed of to another person without advice of the animal's heritable disease status 4. If kept alive, adversely ***affected*** animals should be de-sexed prior to disposal, must not be permitted to suffer from their condition by their owner and must be under the supervision, advice and monitoring of a veterinary practitioner.
Affected x Clear	100% Carrier	1. Should only occur as part of a planned long term breeding program approved by a relevant applicable organisation or an organisation listed in this code for the type of animal.

		2. Records of resultant progeny must be marked with carrier status.
Affected x Carrier Affected x Affected	50% Carrier 50% Affected 100% Affected	1. **Prohibited** unless as part of a planned long term breeding program approved by an approved organisation listed in this code for the type of animal. 2. Intentional or reckless use of this combination outside of an approved breeding program is an offence under the Act. 3. Affected animals must not be disposed of to another person of to another person without advice of the animal's heritable disease status 4. If kept alive, adversely **affected** progeny must be de-sexed prior to disposal, must not be permitted to suffer from their condition by the owner and must be under the supervision and monitoring of a veterinary practitioner.

**Testing is required as in practice the unpredictable nature of the process of gene inheritance in these combinations may cause variation in the actual % outcomes per generation.

With Collie Eye Anomaly (CEA) the approved breeding program must submit all litters before 8 weeks of age for certification by ophthalmologists appointed to the AVA-ANKC ACES Panel, to identify and remove any puppy that is adversely affected by the condition. Once affected percentages in the breed are <20-30%, more restrictive parameters could be applied.]

7.6 Polygenic based heritable diseases

See Sec 3.6.

Generally, where these conditions affect large numbers of the breed, broad-based surveillance and assessment schemes have been developed. The worst affected individuals should be removed from the breeding population before they reach maturity. Development of reliable statistical results such as sire's statistics can further help breeds lower the incidence and severity of the disease. These control schemes have been shown to work over the longer term, by raising the mean health standard.

7.7 Recognised Inherited Diseases that produce significant health risks in small numbers of affected individuals, where there is no advance warning mechanism offered through the early onset of signs or the availability of a reliable genetic test. Some of these diseases are recognised as 'breed predilections', ie. a higher than normal incidence may be observed within that breed. Many of these conditions appear unpredictably in the older animal, with no apparent inheritance pattern.

It may be impossible to establish whether or not a debilitating condition that arises at mature age is controlled by inherited factors at all, and is therefore able to be predicted, selected against or detected in advance by an established genetic test.

General awareness of a possible breed predilection is the best protection that can be issued against these conditions in the longer term. Purchasers of animals likely to develop the condition should consider this when making their selection of an animal to keep or breed.

Dogs:
Hereditary Cataract (where late onset is characteristic of the condition)

8 Approved breeding programs and approved organisations

8.1 Approved breeding programs must be reviewed annually and be consistent with the principles of this Code.

8.2 Approved Organisations.

Species	Approved organisation
Cats and dogs	An 'applicable organisation' approved by the Minister for Agriculture in accordance with the Domestic (Feral and Nuisance) Animals Act 1994.