

Appendix I. Assignment of the original list of 37 welfare issues during the preliminary categorisation task

Issues that received good agreement between anonymous expert responses ($\geq 61\%$) were provisionally assigned to a single category (A = utmost importance, B = high importance, C = limited importance & D = of little importance). Those issues engendering less respondent agreement (51-60%) were provisionally assigned to a group (A/B high or C/D low importance). If $\leq 50\%$ respondent agreement was achieved the issue was not assigned to a category of importance (n/a). Revisions to the list of welfare issues were made at the workshop; those issues that were merged are indicated by subscript (and titled: _aInappropriate husbandry; _bThe welfare cost of treatment; _cProduction of puppies; _dRoutine neutering; _eUndesirable behaviours) and those that were excluded are indicated by *. Revisions to the titles of issues were subsequently made but are not shown here (see Appendix II).

Welfare issue (original)	Importance	Welfare issue (original)	Importance
Inherited disease	A utmost	Physical harm	A/B high
Bad breeding*	A utmost	Puppy farming _c	A/B high
Exaggerated physical features	A utmost	Health problems*	A/B high
Inappropriate environment _a	A utmost	Incorrect interpretation of behaviour _e	A/B high
Inappropriate socialisation and habituation	A utmost	Inadequate legislation*	A/B high
Inappropriate levels of exercise _a	B xxx	Noise phobia _e	A/B high
Cancer and its therapies _b	B xxx	Separation related behaviour _e	A/B high
Mutilations	B xxx	No identification	C/D low
Pet Passport Travel Scheme	C xxx	Routine castration _d	C/D low
Repeated pregnancies _c	C xxx	Lack of neutering	C/D low
Routine spaying _d	C xxx	Quantity over quality of life	n/a
Negative media portrayal	D little	Palliative 'supportive' care _b	n/a
Complementary and alternative medicine _b	D little	Kennelling	n/a
Chronic disease _b	A/B high	Malnourishment	n/a
Displaced dogs (stray)	A/B high	Professional incapacity	n/a
Irresponsible ownership	A/B high	Status and accessory dogs	n/a
Lack of appropriate mental stimulation _a	A/B high	Euthanasia of healthy dogs	n/a
Obesity	A/B high	High cost of maintaining good welfare	n/a
Owner unawareness and ignorance	A/B high		

Appendix II. Welfare issues, as revised by consensus at the panel workshop

Welfare issue	Description
The welfare cost of treatment	Dogs with a disease/disorder can either be treated, not-treated or given inappropriate treatment. Each option may have negative welfare consequences e.g. pain and/or side effects during treatment, persistent symptoms associated with the disease if not treated, or prolonged pain and/or adverse side effects during inappropriate treatment. Inappropriate treatment of a disorder may include overtreatment (e.g. unnecessary blood samples or continuing long-term medication), delay of treatment (e.g. by owner) or use of medicine or therapies for which there is little scientific evidence of efficacy (e.g. complementary and alternative medicines). This welfare issue encompasses any disease/disorder that requires veterinary treatment.
Displaced dogs (stray)	Companion dogs may be displaced from the human home, and may become stray dogs. They may suffer from malnutrition, injury, consequences of adverse weather conditions, lack of social contact and/or disease. This issue does not refer to stray dogs within rescue establishments or pounds (covered in a separate issue – kennelling).
Euthanasia of healthy dogs	Healthy dogs may be humanely euthanized for untreatable severe behavioural problems, overcrowding of rescue centres or warden kennels or for the convenience of the owner.
Conformation-related disorders	Physical, external features perceived to be desirable in certain pedigree breeds are intentionally exaggerated by breeders, which can have a detrimental impact on health and welfare of the individual dog. These disorders can have mild to severe negative welfare consequences
The cost of veterinary treatment	An inability to afford the cost of veterinary treatment may have negative welfare consequences for the dog. Forgoing veterinary treatment may result in failure to prevent a condition or worsening of the disease state.
Inappropriate husbandry	Companion dogs may receive inappropriate husbandry involving levels of exercise, mental stimulation and environmental needs (comfort and space of housing, health checks, owner commitment and routine) This issue considers the psychogenic (mental and emotional) impact, as well as the physical condition of the dogs.
Inappropriate socialisation and habituation	Inadequate or inappropriate socialisation of a puppy during its sensitive period and beyond may have negative welfare consequences, such as fearful or anxious behaviour, causing other problems (see ‘undesirable behaviours’)
Lack of owner knowledge	Owners may lack knowledge relating to behaviour and general husbandry necessary for their animals health and wellbeing, leading to a failure to recognise important indicators of compromised health and welfare. Misinterpretation of animal behaviour, which may lead to unrealistic expectations or inappropriate human responses e.g. attribution of ‘guilt’ may lead to punishment.
Inherited disease	Inherited diseases are caused by spontaneous mutations, which may be amplified through selective breeding. Certain breeds have a genetic predisposition for the development of a wide range of diseases, varying in their severity.
Irresponsible ownership	Owners can be deliberately irresponsible towards maintaining good health and welfare of their companion dogs. Such owners may be aware of appropriate husbandry but choose to ignore it for personal reasons. This issue also refers to the impulsive purchase of a dog that is unsuitable to the environment an owner can provide, including re-homing of dogs to unsuitable homes.
Kennelling	This issue concerns dogs kept in a kennel environment including rescue institutions, boarding kennels, quarantine kennels or other (assuming the experience of kennel for the individual dog is the same regardless of length of time). Kennels may compromise social, environmental and psychological experiences of the dog.
Lack of elective neutering	Intact companion dogs may be exposed to a number of welfare concerns including unwanted pregnancies, displaced dogs and inappropriate care of puppies.
Malnourishment	Excess or deficiency of certain nutrients can cause malnourishment; leading to negative welfare consequences (e.g. protein deficiencies may cause anaemia). This issue does not include overfeeding or obesity, which are considered as separate issues.
Elective/cosmetic surgery	Procedures that involve interference with soft tissue or bone structure, other than for medical purposes may cause pain (which may persist in adulthood) and loss of function. This issue does not concern elective neutering or identification (see issues 24 and 16 respectively).
Media influence	The portrayal of dogs in the media may lead to negative welfare connotations e.g. through the portrayal of status dogs, dog fighting, or popular films increasing the popularity of certain breeds (leading to owners obtaining such breeds on impulse, without appropriate knowledge).
Lack of identification	Lost or displaced dogs that cannot be identified by collar, microchip, tattoo (or other means) may be kennelled for re-homing or humanly euthanized.

Undesirable behaviours	This issue encompasses all behaviours perceived to be a problem or nuisance to the owner e.g. noise phobia, separation related behaviour, compulsive behaviour, aggression or displacement activities. Such behaviours may have an underlying negative emotional basis e.g. fear or anxiety.
Obese and overweight dogs	Obese and overweight dogs have excessive adipose tissue, which can be associated with disease (e.g. diabetes mellitus) or exacerbate other diseases (e.g. orthopaedic disease, cardio-respiratory disease) reducing longevity. Evidence shows that even overweight dogs (not clinically obese) may suffer similar disease states and reduction in longevity.
Long distance travel	This issue concerns companion dogs travelling on journeys of any length by sea, rail, road and air, but excludes routine car journeys (which are assumed to be short and habituated to). This issue also includes the export of dogs/puppies from breeders, assumed to be a similar experience for the dog.
Intentional physical harm	Intentional actions e.g. wilful starvation, dog fighting, cruelty and severe neglect by humans leading to physical harm.
Professional incompetence	Professionals may be unable to treat disease or behavioural problems effectively, or fail to consider referral to a specialist, causing delays in diagnosing and treating problems, or offer inappropriate treatment. This issue refers to all relevant professionals and para-professionals.
Production of puppies	Puppies may be sourced from licensed breeding establishments (producing more than 5 litters per year), breeders regulated by voluntary schemes (e.g. Kennel Club breeder), pet shops or unregulated breeders. Bitches may encounter restricted lifestyles, artificial insemination, repeated pregnancies, elective caesareans, unnatural birth conditions and/or poor management. Puppies may encounter negative welfare associated with transport, disease management, lack of hygiene or overcrowding. This issue mainly considers the health problems associated with the production of puppies; psychological problems of bitches may be covered by 'inappropriate husbandry' and of puppies in 'inappropriate socialisation and habituation'
Quantity over quality of Life	Prolonging an animal's life without regard to its quality of life may cause welfare concerns. Reasons for prolonging a dog's life include improved veterinary treatments, financial support, and owner's reluctance to euthanize their pet.
Routine neutering	Castration and spaying as routine procedures (i.e. not for medical reasons) may have welfare implications. Neutering is invasive and may be associated with pre- and post-operative stress and pain. The issue considers only the direct effects of the procedure.
Fighting, weapon and accessory dogs	Fighting dogs are trained to be extremely aggressive towards other dogs, and are used in a form of 'sport'. Weapon dogs are companion dogs specifically used for aggressive, intimidating and anti-social behaviour; they are typically stocky, aggressive-looking breeds. An accessory dog is used as a symbol of fashion; usually toy breeds that are carried in a handbag.