


Review

# Ethical Concerns about Fashionable Dog Breeding

David J. Menor-Campos 

Departamento de Medicina y Cirugía Animal, Universidad de Córdoba, 14005 Córdoba, Spain; david.menor@uco.es

**Simple Summary:** Humans have selectively bred dogs for various purposes, including hunting, guarding, and service roles. However, over time, preferences have shifted from functionality to aesthetics, resulting in a diverse range of dog breeds with varying sizes, shapes, and coats. Unfortunately, this focus on design and appearance has led to fad breeding, causing genetic disorders, health issues, and a loss of biodiversity. The article looks at fashionable dog breeding and questions the ethics of prioritising looks over health and behaviour. It aims to alert potential owners, breeders and regulators to the importance of considering a dog's overall well-being, not just its appearance. Breeding brachycephalic breeds with respiratory conditions, inbreeding causing inherited disorders, and overbreeding popular breeds while shelter dogs remain unadopted raise ethical concerns. Furthermore, the impact of cosmetic surgeries on popular dog breeds, as well as the neglect of behavioural traits in favour of physical characteristics and strict breeding practices, are also considered problematic. The current breeding model can negatively impact the emotional and cognitive well-being of dogs. This can result in issues such as aggression, anxiety, and other behavioural problems which can significantly reduce the overall quality of life of the animals. Unregulated breeding practices and the demand for rare breeds can lead to illegal breeding, which compromises animal welfare. Prospective owners, veterinarians, kennel clubs, and legislators all need to play a responsible role in protecting animals.

**Abstract:** The historical relationship between humans and dogs has involved selective breeding for various purposes, such as hunting, guarding, and service roles. However, over time, there has been a shift in preferences from functionality to aesthetics, which has influenced the diverse sizes, shapes, and coats of dog breeds. This review looks at fashionable dog breeding and questions the ethics of prioritising looks over health and behaviour. It aims to alert potential owners, breeders, and regulators to the importance of considering a dog's overall well-being, not just its appearance, which has resulted in fad breeding, leading to genetic disorders, health issues, and a loss of biodiversity. Ethical concerns arise from breeding brachycephalic breeds with respiratory conditions, inbreeding causing inherited disorders, and overbreeding popular breeds while shelter dogs remain unadopted. Additionally, the impact of cosmetic surgeries on popular dog breeds, as well as the neglect of behavioural traits in favour of physical characteristics and strict breeding practices are also considered. The current breeding model can have a negative impact on the emotional and cognitive well-being of dogs, resulting in issues such as aggression, anxiety, and other behavioural problems that can significantly reduce their overall quality of life. Unregulated breeding practices and the demand for rare breeds can lead to illegal breeding, compromising animal welfare. Prospective owners, veterinarians, kennel clubs, and legislators all need to play a responsible role in protecting animals.

**Keywords:** fashionable dog; pure-breed dog; ethical breeding; dog breeding; dog abandonment



**Citation:** Menor-Campos, D.J. Ethical Concerns about Fashionable Dog Breeding. *Animals* **2024**, *14*, 756. <https://doi.org/10.3390/ani14050756>

Academic Editors: Simona Cannas, Greta Veronica Berteselli and Susana Le Brech

Received: 31 January 2024  
Revised: 20 February 2024  
Accepted: 26 February 2024  
Published: 28 February 2024



**Copyright:** © 2024 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

The relationship between human and dogs has a long history, of more than 100,000 years [1], whether humans deliberately removed young wolf pups from the den and hand-reared them as dependents, or a more unlikely situation, in which certain wolves might have decided to keep close to those primates which leave a good amount of food behind (see [2]

for a recent discussion on the topic). This relation has shaped our species, helping it to evolve, in the same way that our ancestors, and latter ourselves, shaped other species through domestication [3].

In the early times, dogs probably assisted humans with hunting, guarding, and scavenging, playing a vital role in human survival by alerting us to danger, tracking game, and even participating in cooperative hunting [4]. As humans transitioned from nomadic hunter-gatherer societies to settled agricultural communities, they also helped guard livestock, or protect crops. Later, they would have acted as guardians of human settlement, bringing alarm to intruders or strangers. Linked to power and royalty, they would end up appearing in the mythology, art, and religious practices of many ancient civilizations [4,5]. Our relationship is one of the oldest and most significant human–animal bonds in history, thanks to the remarkable adaptability of dogs and their deep integration into human societies [6].

Over time, human ancestors first, and human beings later, selected dogs for specific traits, from the more sociable or at least manageable, to faster in the run and brave in the hunt, seeking to fulfil different and changing tasks as the time went by, leading to the emergence of breeds [7].

Being the very first species that our human ancestors domesticated has tied dogs to human society seemingly for ever. Nevertheless, domestication, alongside all these processes and all these selection procedures comes at a cost. This new species, dogs (*Canis lupus familiaris*), lost several traits, abilities, and shapes, among other characteristics, in their way to our homes. Dogs are less trouble solving than their wolverines ancestors [8], and often retain juvenile traits and behaviours into adulthood, a phenomenon known as neoteny [9], which might make them more human dependent, and thus desirable. On the other hand, dogs have become more tolerant, decreasing their aggressiveness and increasing their playfulness, which facilitates social interactions and enhances the human–dog bond, while adapting to live closely with humans in a wide variety of environments and situations [10,11].

However, as the value of dogs as companion animals increases and their ownership becomes more commonplace in western culture, the popularity of certain traits in fashion breeds has raised concerns about the ethical implications of prioritising appearance over health. Instead of researching and selecting a breed that suits a particular lifestyle, or even considering adoption from shelters and rescue organizations, some owners choose their pet based solely on its physical appearance, treating it as a fashion accessory, and even ignoring the potential welfare problems related to extreme conformation and inherited disease [12,13]. Although many disorders and gene variants in dogs are shared among closely related breeds due to the historical population dynamics of this species, many disorders are specific to certain breeds [14], and they are often linked to distinct morphological characteristics of these breeds [15].

In this scenario, commercial dog breeding, especially of fashionable breeds (those that become commercially most popular in a very short time), can lead to a breakdown in the human–dog bond, as dogs are treated as commodities rather than valued companions [16]. This, in turn, would mean insufficient consideration of dogs' welfare needs and interests, leading to potential harm and suffering [16]. An increasing number of dogs are purchased worldwide each year. However, a lack of data on the conditions faced by dogs in commercial breeding kennels, during transport, and after they are discarded impedes a comprehensive understanding of the extent and nature of the issues, as well as potential solutions. Breeding dogs solely for their physical appearance in order to increase profits is itself a real form of animal abuse [17]. Additionally, the conditions in which dogs are bred are often harmful, with overcrowding and unsanitary environments leading to lifelong mental and physical health issues. Plus, a selective breeding focus on physical traits only can lead to a decrease in the genetic variability of the species, an accumulation of genes associated with pathologies, and an exaggeration of physical traits to levels that may compromise health [18,19]. Selecting dogs based solely on their physical appearance

implies that an unknown number of discarded dogs that did not meet expectations, even though they may not appear in statistics and nobody knows what their fate is.

Therefore, this article presents current information on fashionable dog breeding and explores and analyses the ethical issues connected with prioritising physical appearance over health and behavioural well-being in order to spark the concerns of prospective owners, breeders, and regulators by highlighting what is behind the dog they choose.

## 2. Historical Context

### 2.1. *The Very First Dog Breeds*

Even though this seems to be a debate that is still open, there are several breeds that could be considered to be among the oldest dog breeds in the world. The Greyhound breed is considered to be one of the oldest purebred domesticated dog breeds [20], with indications of its existence dating back to the era of the Pharaohs, and the earliest documented records of greyhound-like dogs originating from about 8000 years ago [21]. This breed is closely followed by Basenji [20], a breed that is believed to have originated in Africa, dating back to around 6000 BC, with Libyan cave paintings that depict the hunting dog as a time reference. Following this, the Saluki breed, which has a long and ornate history with remains tracing to ancient civilizations such as the Egyptians, Sumerians, and Persians, with archaeological evidence dating back at least 5000 years, comprised a sighthound developed from the Fertile Crescent and used by nomadic tribes to hunt by sight [22]. Other breeds around this history time are the Akita Inu, believed to have been originated in Japan more than 5000 years ago [23]; the Siberian Husky and Alaskan Malamute, deriving 4000 years ago [23]; the Afghan Hound, 3000 years ago [23]; and the Chow Chow and Shar Pei, 2000 years ago [22].

In addition to the exact point at which these breeds appeared, what seems to be common in all of them is that they all would have been selected because of their endurance capacity or their abilities for hunting in different part of the world [22,23].

### 2.2. *The Modern Breeds*

The physical variability in domestic dogs is remarkable, as is their size, with striking differences between the miniature and the giant breeds [24]. This extensive phenotypic diversity arose through thousands of years of artificial selection and reached its peak in the creation of hundreds of breeds over the last two centuries [25].

Still, this selection is still on the run. As societal and human needs have changed, the role that dogs play has changed as well, passing from purely hunting dogs to being used for transportation, guarding, herding, police dogs, search and rescue dogs, more recently as service animals for individuals with special needs, but also as a luxury value or a fashion good. In these cases, aesthetics heavily influence dog choice and, therefore, breed conformation, leading to an industry primarily focused on a dog's appearance [26], as owners shift from prioritising the animal's utility to emphasising its visual appeal [13]. There are over two hundred breeds—the Federation Cynologique Internationale recognises 356 breeds [27], meanwhile the American Kennel Club 200 breeds [21], each of them with an established breed standard which specifies precise phenotypical ground regarding colour, height, or body shape alongside other specific physical features such as tail length or ear positioning, which might even require surgical interventions. Appearance is not everything. But it does matter.

### 2.3. *Neoteny, Problem-Solving Skills, Independence, and Maturity*

Certainly, thousands of years of selection and domestication have influenced dogs' behaviour, making them more inclined to be in close proximity with humans [28]. This has also facilitated their ability to cooperate and communicate with humans [29–31], interpreting owners' gestures, such as gaze, cues, or pointing [31,32], or even being able to understand humans' attentional states [33,34]. But they have also lost something in the run.

Neoteny [9] is the term that describe the retention of juvenile traits into adulthood, based on human preferences [35]. It is a common evolutionary phenomenon linked

to domestication that significantly influences the physical appearance—childish—and behaviour—friendly—of animals throughout their domestication journey, and has been a driving force behind the remarkable diversity in the dog breeds that we witness today. Thus, selective breeding for certain traits, such as a more youthful appearance, smaller size, and altered physical features, has made dogs more endearing and visually appealing to humans over thousands of years, playing a role in the likelihood of dogs being allowed to breed, adopted, and cherished as companions [35,36].

However, the prolonged retention of juvenile characteristics in dog breeds has led to concerning health ramifications, such as the size and shape of their heads [37], extreme alterations in body structure [38,39], or even alterations in their behaviour [40].

In addition, neoteny also affects the pace of sexual maturation in dogs. Domestication is known to cause a general acceleration of sexual maturity in animals [9], and this phenomenon occurs also in dogs [41–43], affecting their behaviour [44] and health [18].

On the whole, many dogs seem to have lost their problem-solving skills, independence, and maturity in exchange for a stable source of food and care compared to wolves. Although some dogs still have problem-solving skills, such as earthquake dogs, as well as drugs and weapons dogs in airports, the average dog seems to struggle when confronted with a challenge. When faced with challenging tasks or puzzles, wolves tend to persevere and actively engage with the problem until they find a solution, while regular dogs often display a tendency to seek human intervention or assistance when encountering difficulties [31]. Though this reliance on human guidance might stem from their long history of domestication and dependency on humans for survival, it might have impacted their independent problem-solving capabilities [45].

Moreover, studies focusing on the social dynamics and cooperation within wolf packs versus dog groups have highlighted intriguing differences, as wolves have been found to display higher levels of prosocial behaviour compared to dogs in certain contexts. This distinction in social behaviour further reflects upon their problem-solving strategies. Wolves, being more prosocial, might rely on each other within their pack, sharing information and collaborating to solve problems, whereas dogs might be more inclined to seek assistance from humans due to their dependency [46].

### 3. Genetic Hazard

#### 3.1. Increased Risk of Inherited Disorders

Breeding for specific traits may unintentionally increase the likelihood of genetic disorders [18], making them sadly common among popular dog breeds [13]. For instance, Border Collies, which are among the world’s most popular breeds, are known to have at least 25 inherited disorders [47]. Table 1 shows a non-comprehensive list of inherited disorders in popular dog breeds.

**Table 1.** Examples of inherited disorders in popular dog breeds.

Breed	Inherited Disorder	Reference
German Shepherd	• Hip dysplasia	• [48,49]
	• Exocrine pancreatic insufficiency	• [50,51]
	• Degenerative lumbosacral stenosis	• [52,53]
Labrador Retriever	• Canine atopic dermatitis	• [54]
	• Tricuspid valve malformation	• [55,56]
	• Copper associated chronic hepatitis	• [57,58]
Jack Russell Terrier	• Legg-Calve-Perthes disease	• [59]
	• Epilepsy	• [60]
	• Pulmonic stenosis	• [61]
French Bulldog	• Brachycephalic obstructive airway syndrome (BOAS)	• [62,63]
	• Dystocia	• [64]
	• Corneal ulceration	• [65]

Table 1. Cont.

Breed	Inherited Disorder	Reference
Golden Retriever	<ul style="list-style-type: none"> <li>• Hip dysplasia</li> <li>• Elbow dysplasia</li> <li>• Heart conditions</li> </ul>	<ul style="list-style-type: none"> <li>• [66,67]</li> <li>• [68,69]</li> <li>• [70,71]</li> </ul>
Bulldog	<ul style="list-style-type: none"> <li>• Skin fold dermatitis</li> <li>• Prolapsed nictitating membrane gland</li> <li>• Protruding lower jaw</li> <li>• Brachycephalic obstructive airway syndrome (BOAS)</li> </ul>	<ul style="list-style-type: none"> <li>• [72]</li> <li>• [73]</li> <li>• [74]</li> <li>• [63]</li> </ul>
Cocker Spaniel	<ul style="list-style-type: none"> <li>• Nephropathy</li> <li>• Glaucoma</li> <li>• Distichiasis</li> </ul>	<ul style="list-style-type: none"> <li>• [75,76]</li> <li>• [77]</li> <li>• [78,79]</li> </ul>
Beagle	<ul style="list-style-type: none"> <li>• Skin problems</li> <li>• Neonatal cerebellar cortical degeneration</li> <li>• Canine degenerative myelopathy</li> </ul>	<ul style="list-style-type: none"> <li>• [80]</li> <li>• [81]</li> <li>• [82]</li> </ul>
Rottweiler	<ul style="list-style-type: none"> <li>• Unilateral cranial cruciate ligament rupture</li> <li>• Canine degenerative myelopathy</li> <li>• Elbow dysplasia</li> </ul>	<ul style="list-style-type: none"> <li>• [83]</li> <li>• [84]</li> <li>• [85]</li> </ul>
Dachshund	<ul style="list-style-type: none"> <li>• Intervertebral disk disease</li> <li>• Heart conditions</li> <li>• Chronic enteropathy</li> </ul>	<ul style="list-style-type: none"> <li>• [39,86,87]</li> <li>• [88]</li> <li>• [89]</li> </ul>
Cavalier King Charles spaniel	<ul style="list-style-type: none"> <li>• Fly catching</li> <li>• Idiopathic epilepsy</li> <li>• Idiopathic facial nerve paralysis with or without associated vestibular disease</li> <li>• Degenerative myelopathy</li> </ul>	<ul style="list-style-type: none"> <li>• [90]</li> <li>• [91]</li> <li>• [92]</li> <li>• [82]</li> </ul>
Pugs and Basenjis	<ul style="list-style-type: none"> <li>• Hemivertebrae and spina bifida</li> </ul>	<ul style="list-style-type: none"> <li>• [47,93]</li> </ul>
Rhodesian Ridgeback	<ul style="list-style-type: none"> <li>• Dermoid sinus</li> <li>• Arrhythmia and sudden death</li> </ul>	<ul style="list-style-type: none"> <li>• [94]</li> <li>• [95]</li> </ul>
Dalmatians	<ul style="list-style-type: none"> <li>• Deafness</li> </ul>	<ul style="list-style-type: none"> <li>• [96,97]</li> </ul>

This breeding practice also results in diminished genetic diversity, the accrual of detrimental genes, and the amplification of specific physical traits, consequently elevating the health risks they face [98,99]. Mellanby [100] explains this phenomenon through the concept of a 'breed barrier' that encourages inbreeding, as animals need to have five previous generations of ancestors registered as the same breed before they can be registered as a pure-breed dog, promoting reproductive isolation.

Additionally, as breeders prioritize the appearance of their dogs to meet specific physical breed standards, as approved by organizations such as kennel clubs, they can obscure the genetic predisposition of these dogs to various illnesses and physical issues. In 2009, Asher et al. [26] conducted a study documenting 396 inherited disorders within the top 50 breeds in the United Kingdom. These disorders affect a variety of systems, including musculoskeletal, integumentary, nervous sensory, cardiovascular, urogenital, respiratory, gastrointestinal, immune, and endocrine; and their frequency showed a correlation with the registration numbers of specific breeds, indicating an increased likelihood of such disorders with continued breeding of the same dog breeds.

Distinctive traits can often differentiate one breed from another, but these same traits can also be direct triggers for medical issues that persist throughout a dog's life. For example, certain breeds with smaller cranial cavities may be more susceptible to severe neurological conditions such as syringomyelia [90]. One of the most frequently observed conditions among these is Chiari-like malformation/syringomyelia in the Cavalier King Charles Spaniel. This breed is also susceptible to various neurological conditions, such as fly catching [90], idiopathic epilepsy [91], idiopathic facial nerve paralysis with or without associated vestibular disease [92], and degenerative myelopathy [82], all of which are linked to the shape of their lovely skull.



Breeds with curly tails, such as Pugs and Basenjis, are prone to spinal issues like hemivertebrae and spina bifida due to the nature of their tails [26,93]. The Rhodesian Ridgeback is named after the distinctive ridge of hair along its lower back, which stands in the opposite direction with two whorls near the head. Regrettably, the name of this breed is linked to dermoid sinus, a developmental abnormality that creates tubular indentations in the skin above the spine. These tunnels can penetrate deep into underlying tissues, even reaching the spinal cord, exposing affected animals to infection risks that cause severe disease and pain. Salmon Hillbertz and Andersson [94] have confirmed the inheritance of the dorsal ridge in Rhodesian Ridgebacks through an autosomal dominant mode, linking it to dermoid sinuses. Although not all Rhodesian Ridgebacks are born with this ridge, breed standards mandate its presence [101]. Furthermore, this breed is known to suffer from arrhythmia or sudden death, which may be associated with an autosomal recessive pattern of inheritance [95].

Deafness in Dalmatians is linked to the extreme piebald gene [96], which is responsible for the majority of their coat's whiteness and, in some cases, their blue eyes. Dalmatians exhibit a homozygous recessive trait for the extreme piebald gene, and deafness appears to manifest as a linked polygenic disorder. Inheriting this gene significantly increases the likelihood of also inheriting genes that cause deafness [97]. However, some Dalmatians may exhibit incomplete penetration of the extreme piebald gene, resulting in larger patches of dark fur than the typical spots as well as a lower risk of deafness [102]. Unfortunately, these patches are considered flaws or faults according to the breed standard.

More broadly speaking, Asher et al. [26] have linked dog size and several conditions, stating that taller dog breeds are more prone to cardiovascular, gastrointestinal, integumentary, and musculoskeletal disorders, such as hip and elbow dysplasia, which are often linked to their larger body size and rapid growth. Conversely, lighter breeds exhibit a greater incidence of respiratory, urogenital, and endocrine disorders. In contrast, smaller breeds are at a higher risk of developing nervous sensory, respiratory, and urogenital issues, as well as specific conditions like odontoid process dysplasia, shoulder dysplasia, and patellar luxation. Additionally, smaller dogs are particularly susceptible to conditions such as patellar luxation, which can lead to lameness. In addition, these authors also highlight that breeds with brachycephalic, short skulls may experience respiratory challenges due to their skull structure, including dyspnea, stenotic nares, elongated soft palate, and hypoplastic trachea. Selecting breeds to produce dogs of such extreme sizes, whether giant or dwarf, would push forward all these related conditions.

The Universities Federation for Animal Welfare [103] operates a website (<https://www.ufaw.org.uk/dogs/dogs> (accessed on 10 January 2024)) that provides information to prospective owners about genetic welfare problems in companion animals. The website details health issues related to genetic conformation in over 40 dog breeds.

### 3.2. Challenges of Physical Traits

Evidence suggests that physical appearance outperforms health considerations when acquiring a dog [104,105]. Too often, body size [106] or hair type and length [107] were prioritised over health and longevity [108]. Indeed, the most popular breeds usually have significant health issues [13]. Breeds such as Bulldogs, Pugs, and French Bulldogs are often admired for their cute and 'pushed-in' appearance, characterized by short snouts and flat faces, following the Lorenz's 'baby schema': Infantile facial features elicit positive emotions and nurturing responses in human adults [109]. Cultural factors and anthropomorphism might have affected the demand for these characteristics, referred to as brachycephalic features. Animals with flat faces, wide-set eyes, truncated snouts, and rounded faces tend to elicit feelings of endearment and cuteness, reminiscent of a baby-like charm. This is a distinctive appearance that can foster a sense of protectiveness and care among humans [110].

Media forms such as advertisements, movies, cartoons, and social platforms can significantly influence public perceptions and preferences [13,111,112]. However, this conformation can cause brachycephalic obstructive airway syndrome (BOAS, see [37] for

a recent review of this syndrome), with a high predisposition to a range of disorders intrinsically related to this conformation, including respiratory disease [39,65,113], eye disease [39,113,114], dystocia [65], spinal disease [115], or even exercise intolerance and heat stroke [113], alongside a higher prevalence of health problems thought to be unrelated to conformation, such as skin cancer [113], and a shorter lifespan compared to moderate and non-brachycephalic dogs [114]. The situation is so dramatic that professionals have warned against the unsustainable breeding of Bulldogs, Pugs, and French Bulldogs due to their health and welfare issues, yet these breeds remain popular with owners [116].

Breeds like Pekingese, Shih Tzus, and Cavalier King Charles Spaniels are known for their large, expressive eyes, which can convey a wide range of emotions, including happiness, curiosity, innocence, and vulnerability, and they have been used even in various forms of art and illustration to convey emotion, personality, and character depth [117]. As humans often connect or empathize with animals that display emotions similar to their own, having this trait will reinforce our willingness to interact with these animals [118–120]. Furthermore, as humans are a visual species, expressive eyes can create a sense of understanding and bonding, as people interpret the emotions behind the gaze [104].

The problem is that these dogs with large, bulging eyes are more susceptible to eye injuries, infections, and conditions such as corneal ulcers. Breeds with flat faces, such as Pugs and Boston Terriers, are also at a higher risk of eye issues and injuries, including cherry eye (prolapsed gland of the third eyelid), due to the shape of their eyes [121]. These dogs frequently have wide eye openings and shallow eye sockets, which causes their eyes to protrude more than usual [122]. This unique eye structure can make them susceptible to damage from external sources and even prevent them from fully closing their eyelids [122,123], resulting in inadequate blinking (lagophthalmos). This inability to blink properly compromises the protective tear film, leading to dry areas on the cornea that can eventually erode and cause ulcers [124].

But it is not only flat-faced or wide-eyed dogs that are people's preferences. People are drawn to Dachshund dogs for their unique appearance, playful personality, adaptability, and historical significance [125]. Dachshunds, often referred to as "wiener dogs" or "sausage dogs", have a distinctive elongated body and short legs that make them stand out in a crowd and contribute to their charm and individuality, creating a comical and adorable appearance that appeals to many people's sense of humour. Initially selected for hunting, Dachshunds have been featured in various forms of media, including movies, TV shows, advertisements, and social media, which might have influenced people's choices [13,111]. In addition, they are also known for their lively and playful personalities. Despite their determination and independence, they are often curious and energetic while enjoying being close to their family members, forming strong bonds with their owners, and developing a loyal and affectionate connection. Therefore, they have captured the hearts of many dog lovers, despite their specific health considerations due to their elongated body structure, such as intervertebral disc disease (IVDD) [126] and spinal issues. Though IVDD can affect dogs of various breeds, it is more commonly seen in those breeds with longer backs and shorter legs, such as Dachshunds, but also Beagles, Corgis, and Basset Hounds [38,39]. The spinal discs act as cushions between the vertebrae and allow for flexibility and shock absorption in the spine. IVDD occurs when the inner, gel-like material of a spinal disc herniates or ruptures through the tougher outer layer, causing compression on the spinal cord or nerve roots [126]. The consequences of IVDD and spinal issues in dogs can vary depending on the severity of the condition and the location of the affected disc, but they can cause varying degrees of pain and discomfort, from stiffness to reluctance to move and a hunched posture, compression of the spinal cord or nerve roots, and can lead to neurological symptoms such as weakness, wobbliness, loss of coordination, causing difficulty to walk or even stand [127,128].

While some cases of IVDD can be managed without surgery through conservative measures such as rest, pain medication, anti-inflammatory drugs, and physical therapy, severe cases of IVDD can lead to complete paralysis of the affected limbs or even the

entire hindquarters, and dogs may lose control over their bladder and bowel functions, impacting dogs' quality of life and requiring surgical intervention to remove the herniated material and stabilize the affected area by alleviating pressure on the spinal cord and nerve roots [128].

Other joint and skeletal issues, such as hip or elbow dysplasia, are also common in breeds like Bulldogs, Basset Hounds, and Dachshunds due to their unique body shapes, leading to chronic pain, mobility issues, behavioural problems related to aggressiveness, and compromised welfare [129].

Other aesthetic choices, such as the wrinkled skin in dogs like Shar Peis and Bulldogs, can contribute to a breed's charm, but these features can also lead to skin infections and irritation within the folds [130]. Wrinkled skin folds can trap moisture, dirt, and debris, making regular cleaning and maintenance necessary to prevent skin infections [131]. This may set certain breeds apart from others, making them easily recognizable and distinct and attracting people by their uniqueness. People may find the texture of the skin interesting and enjoyable to touch, as it provides a different tactile experience when petting or interacting with the dog. The soft and pliable nature of wrinkled skin can evoke feelings of comfort and tenderness. Furthermore, the folds and creases on a dog's face can create comical and expressive facial expressions and can evoke emotions like amusement and warmth in humans. But none of these reasons can be more important than the health of the dogs themselves.

### 3.3. Loss of Biodiversity

As breeders of fashionable dogs prioritize specific physical traits, such as coat colour, size, shape, or other distinctive features, they cause the selection of a narrow range of the genetic diversity within the breed, contributing to the loss of biodiversity within dog species. To obtain the desired appearance traits, breeders usually rely on close inbreeding or breed from a limited number of individuals with the desired traits, which creates a kind of genetic bottleneck accompanied by a consequent reduction in the gene pool and, therefore, a loss of genetic diversity [132]. Furthermore, this can have negative consequences for the health and well-being of the dogs by increasing the likelihood of passing on undesirable traits, including genetic disorders, to the next generation while ignoring the breed's original functional traits or working abilities.

Genetic bottlenecks and the drastic decrease in the genetic variation in populations are often associated with events such as natural catastrophes or epidemics. In the case of the dog, Machová et al. [133] have attributed their occurrence to breeding from a very small number of parents. In some breeds, such as the Border Collie, 50% of their genetic variability is linked to fewer than ten animals [134].

While the number of individuals in the different breeds has grown over the last thirty years, their inbreeding coefficient has doubled, and an average of 70% of the genetic variability has been lost [135]. Inbreeding could easily have been avoided, judging by the number of dogs registered as purebred, but genetic analysis confirms that this has not been the case. In fact, dogs have lower intraspecific variation than humans or mice [136].

Both inbreeding and genetic bottlenecks can lead to a population of dogs that look and behave similarly, as breed standards request, but they also have negative consequences for a breed's health and well-being: inbreeding can concentrate recessive genetic disorders, leading to higher rates of inherited health problems [26,121] due to an increased load of deleterious variation [137]; reduced genetic diversity can compromise the breed's ability to resist new diseases and adapt to changing environments [135].

Responsible breeding practices that prioritize genetic diversity, health, and overall well-being are crucial to mitigate the negative effects of inbreeding and genetic bottlenecks. Genetic testing, outcrossing (breeding with unrelated individuals), and careful selection of breeding partners can help maintain the long-term health and viability of dog breeds. Otherwise, the popular sire phenomenon will spread inherited defects [99].



### 3.4. Behavioural Divergence of Breeds

Selective breeding can have a significant impact on the behaviour of animals, as well as their overall health and well-being. Interestingly enough, popular breeds are not necessarily better in terms of behaviour, lifespan, or health outcomes. In fact, Ghirlanda et al. have found that popular dog breeds tend to be less trainable and more prone to separation anxiety, fear of other dogs, and aggression towards their owners [13].

Given that animal behaviour is a significant factor in abandonment or relinquishment to shelters [138], it should be expected to be one of the more interesting issues to be considered by breeders and breed standards. However, Asher et al. [26] suggest that aesthetics play a more significant role in the industry's focus, with appearance taking precedence over behaviour. Indeed, breeds can become popular despite problematic behaviour rather than because of good behaviour [13].

Dogs' behaviour and temperament are formed, conditioned, and modulated both by genetics and life experiences [139]. Therefore, all those awkward situations that dogs suffer in commercial breeding facilities will shape their behaviour.

Selective breeding has also influenced the genes associated with behaviour [140], and the degree of selection has also impacted behaviour [141]. The observed behavioural differences suggest that dog breeds have diverged not only morphologically and genetically but also behaviourally [142].

Previous studies have identified breed variations in noise sensitivity [143–145] and fearfulness [146–152].

While certain breeds which have been selected for hunting, such as Pointers, seem to tolerate sudden noise better [143,145], other breeds selected for herding or even cross-breed dogs showed a high sensitivity to noise [153]. Whether a random effect—popular sires, genetic drift—or a correlated one linked to other undesired traits, the alleles of anxiety genes seem to have been accumulated in specific breeds during selection [145].

Wright et al. [154] have found that smaller breed dogs tend to show higher impulsivity levels than larger breed dogs, which they explain is due to owner efforts to control dogs of a considerable size to prevent worse problems; in comparison, owners show indulgence towards small dogs' activities because the consequences or the perceived risk is minor.

Research has also found a correlation between a dog's size and its likelihood of exhibiting aggressive behaviour. Smaller dogs have been shown to be more prone to aggression, as well as other undesirable behaviours such as fear [142,155–161]. Aggression and fear are associated with the same genetic loci linked to small body size, as suggested by the correlation found in Zapata et al.'s studies [162,163].

As the breeding of dogs can have an impact on their mental health, certain breeds may be more susceptible to issues such as fear of other dogs, separation anxiety [142], and sensitivity to touch. Duffy et al. [164] have found significant breed differences in aggression levels, where those breeds that are bred for guarding, protection, or fighting purposes may have a higher likelihood of displaying aggressive behaviours. But they also found that aggression is not solely dependent on breed but is influenced by individual variation within breeds as well, which highlights the importance of considering an individual dog's temperament and behaviour when choosing the sires.

Additionally, studies have shown that certain behaviours, such as trainability, aggression towards strangers, attention seeking, and attachment, may be more heritable than others [165]. Col et al. [144] have investigated abnormal repetitive behaviour, and Dinwoodie et al. [147], Flint et al. [166], Hsu and Sun [167], McGreevy et al. [160], Serpell and Duffy [149], and Takeuchi et al. [168] have explored aggression, while Takeuchi et al. have studied separation-related behaviour [168].

Most studies have difficulty establishing a definitive correlation between dog breeds and certain behaviours due to sample characteristics. Some breeds are more prevalent than others, while some are underrepresented. Additionally, outcomes may be blurred by differences in background, life experience, and ownership. Furthermore, it was not

investigated whether the specific behaviour was due to the breed's genetic makeup or a particular line of ancestors.

#### 4. Irresponsible Dog Breeding

##### 4.1. Packed Shelter Dogs: Overbreeding and Abandonment

Dogs exhibit high fertility rates, encompassing pregnancy rates, birth rates, and litter sizes, while experiencing relatively low abortion and stillbirth rates, although variations exist among breeds [169]. The combination of elevated fertility and a robust demand for dogs makes breeding a lucrative venture. However, this has led to overproduction, contributing to the overcrowding of animal shelters and the euthanasia or killing of millions of dogs annually, either due to waning interest or economic considerations.

The emergence of third-party sales, notably through "puppy mills", has begun in certain countries like the UE, the USA, and Australia. Nevertheless, the proliferation of online platforms and direct buyer interactions complicates regulatory control, which is exacerbated by the absence of stringent regulations governing the trade of pedigree dogs. Little is known about the fate of dogs discarded during the selection process for new traits, or the numbers of litters rejected for not being big, small, flat faced, fluffy haired, or cute enough, alongside retired breeding females and leftovers. However, these animals, deemed as low-value commodities, may end up roaming the streets or overcrowding shelters.

Estimates from the European Union suggest that around 100 million abandoned companion animals, with the majority residing in member states, contribute to the persistent issue of pet overpopulation [170]. In the U.S., the ASPCA estimates that approximately 3.1 million dogs enter animal shelters annually, with 390,000 dogs being euthanized each year [171]. The most common source of dog acquisition is from breeders, accounting for 34% in contrast to the 23% sourced from shelters [172].

While the duration of a dog's stay in a shelter varies widely [173], the lack of euthanasia policies results in the development of long-term dog populations, particularly for older, male, large-sized, neutered dogs of a "dangerous breed" displaying behavioural problems such as aggression and high arousal [174,175].

Dogs placed in the shelter environment face various stressors, such as disruptive sounds, movement restrictions, and the loss of social connections [176]. Prolonged shelter stays can negatively impact dogs, leading to increased signs of aggression, restlessness, and difficulty relaxing, as observed in long-term-stay dogs [175]. Chronic stress-related behaviours, including increased aggression, excitement, uncertainty, paw lifting, vocalizations, repetitive behaviours, circling, self-licking, panting, and holding the head up during rest, may manifest over time [177–180]. The presence of these behaviours reduces the likelihood of dogs being adopted, creating a negative cycle where they spend more time in shelters and are less likely to be rescued while thousands of potential owners worldwide are looking for a new puppy.

##### 4.2. Dogs as a Value Product: Inbreeding and Puppy Mills

The business model is founded on three key principles: ensuring supplies align with demand, maximizing production, and minimizing costs. Though these issues are already prevalent in many conventional commercial dog-breeding programmes, they are even more pronounced in the context of fashionable breeds.

The popularity of a breed, its fluctuations, and the rates of increase and decrease around popularity peaks are not necessarily aligned with inherent breed characteristics. Instead, these parameters are primarily influenced by trends and fashions rather than functional considerations [13]. For instance, showcasing a dog as a heroic character in a film can result in a substantial increase in breed registrations for that specific breed, and this trend may persist for up to ten years after the movie's release [181].

Once the demand exists, the supply must be delivered quickly, so a breeder will try to bring certain dogs to market. But the problem is that when you are looking for a dog with specific traits, you have to control which dogs are the parent, and the parent of the parent,

and the parent of them, and so on as long as possible, to avoid some recessive gene showing up in the litter of your interest while ensuring that the desirable traits will be present in them. At this point, breeders have two main options. On one hand, they could spend time and money checking the DNA of the potential parent, so as to ensure that neither stranger nor hazardous genes can pass to the precious descendent. On the other hand, they could turn to dangerous practices, such as inbreeding.

The term 'inbreeding' originated from the Victorian practice of intentionally introducing a novel trait, such as a curled tail or a specific coat pattern, by consistently breeding dogs that exhibit that particular characteristic. This process often commenced with crosses between parent and offspring or among siblings [182]. This breeding method enables the rapid fixation of significantly altered traits within a population. However, several generations of inbreeding aimed at stabilising a particular trait can lead to offspring that are predominantly homozygous. In addition to the actively selected traits, other alleles and characteristics tend to rise to high frequency during this process, a phenomenon often referred to as 'hitchhiking', which may occur due to the physical linkage between genomic regions that regulate multiple traits [183] or because of the pleiotropic effects of the selected trait. And in many cases, this also increases hereditary pathology and conformational disorders, such as orthopaedic and joint disorders [26,184,185]; skin disease [26]; aural disease [186]; ocular disease [121,187]; or even breathing difficulties, like the sadly famous brachycephalic obstructive airway syndrome (BOAS) [121,188,189].

In numerous dog breeds, the effective population size remains relatively small due to tightly controlled breeding within closed populations [99]. Dogs that are not intended for breeding purposes are often neutered, and human intervention in selecting and controlling breeding pairs further reduces the reproductive population compared to the census population. Population reductions often result in a significant loss of genetic diversity due to genetic drift, which can lead to increased homozygosity and a higher risk of inbreeding depression. This can reveal recessive harmful traits or occur through over-dominant genetic positions, where the hybrid form exhibits superior fitness. Inbreeding depression can also lead to reduced fertility, such as sperm abnormalities [190], and an increased incidence of congenital diseases [191,192].

Furthermore, inbreeding can have a negative impact on lifespan, as it has been observed across various species, from fruit flies [193] and butterflies [194], to cattle [195] or dogs [196,197].

As the phenotypic variation in dog species is widely recognized, there is significant diversity in the mean genomic inbreeding and the frequency of deleterious alleles among dog breeds, with larger breeds tending to exhibit higher levels of inbreeding compared to smaller breeds [197]. These variations in inbreeding do not appear to be related to the current size of the breed population. Instead, they are associated with differences in inbreeding strength at the time of breed creation, such as founder effects, and variations in modern or historical breeding practices, such as the use of popular sires.

Inbreeding practices are frequently linked to puppy mills, which are commercial farming operations that breed large numbers of purebred dogs [198]. These 'puppy farms' prioritise the production of a large number of animals over the welfare and quality of their puppies. They have no qualms about breeding indiscriminately, in conditions of constant confinement with little or no socialisation, human contact, or veterinary care [199].

Conditions in these facilities can vary from clean and well-maintained to unsanitary and harmful to animal health and welfare [200–202]. They often house a large number of dogs and aim to maximize space within legal limits. Dogs bred for reproduction are frequently confined to cages throughout their reproductive lives, with little opportunity for exercise or positive human interaction, and their healthcare needs are often neglected [203,204].

Dogs need sufficient space for movement, play, and exploration, which are essential for their physical and mental well-being [205]. They are sociable animals and require regular social interaction and exercise [206–208]. Animal welfare risks in such conditions

arise from confined spaces, inappropriate group sizes, exposure to artificial light, loud or distressing sounds, strong odours, uncomfortable temperatures, and unsuitable flooring. These conditions can result in health hazards, hindrance in displaying natural behaviours, restricted movement, disrupted resting patterns, sensory overload, stress from isolation, and an inability to engage in playful behaviour [209,210].

Prolonged confinement and insufficient social stimulation contribute to the development of behavioural problems and a poor level of welfare in dogs [211]. They tend to exhibit behavioural and psychological irregularities compared to the general population of pet dogs [203,212], such as in stereotypical behaviours [213].

These dogs also tend to develop intense and lasting fears, potential learning difficulties leading to lower trainability, and often struggle to adapt to normal life, showing anxiety, house-soiling behaviour, and compulsive behaviours even after years [214].

The lack of an adequate socialisation and exposure to environmental stimuli, which are common in commercially bred dogs, may result in the development of what is commonly referred to as ‘kennel-dog syndrome’, characterized by the animal exhibiting fear and timidity in unfamiliar social situations or environments [215,216]. They might also display abnormal behaviours such as compulsive or repetitive behaviours, reduced trainability due to cognitive deficiencies, or an inability to form proper connections with humans [157,217,218], alongside a high sensitivity to touch and increased reactivity [5].

This experience is even worse for puppies, and they might be affected even from their gestation. The psychological development of the foetus can be significantly impacted by the circumstances and experiences during the prenatal phase of breeding dogs in ‘puppy mills’. Research has shown that offspring from pregnant animals exposed to stressors may exhibit neurohormonal dysfunction [219] and disruptions in the regulation of the HPA axis [220–222]. Offspring may exhibit abnormal responses to stress [223], increased sensitivity to stressors [224], and difficulties in coping with stress [225]. Additionally, individuals with this condition may display exaggerated distress reactions to unpleasant events [226], have impaired learning abilities [227], exhibit atypical social behaviours [228], experience increased emotional responses and fear-related behaviours [229,230], and show escalating fearful behaviours with age [231].

Furthermore, if these offspring face additional challenges during adulthood, they may become even more vulnerable to adverse health outcomes [232]. Studies have also indicated that they may display behavioural deficiencies and molecular alterations similar to those observed in individuals with schizophrenia [233]. Later, as puppies, social isolation may cause lifelong disturbances and compromised learning abilities [234–236].

#### *4.3. Lack of Control over Dog Breeding Promotes Criminal Activity*

An increased demand for puppies and consumer preferences for designer breeds have led to changes in the dog trade, with the emergence of large producers, international trade, and internet sales [237–239] making trafficking an attractive business for mafias [240,241].

A report by the European Commission in the EU has described the illegal activities associated with the dog trade [242]. The position statement notes that a significant proportion of traders undermine EU regulations on the non-commercial transport of pets in order to conceal their true commercial endeavours. Regulation (EU) No 576/2013 allows individuals to travel with up to five animals under certain circumstances without having to register them in TRACES (TRACES, Trade Control and Expert System, is the European Commission’s online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and feed of non-animal origin, and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products) (Trade Control and Expert System) or show them at BCPs. However, this regulation is being abused by scammers. The second finding of the investigation was that forged and falsified documents were consistently used to accompany the importation of dogs and cats into the European Union from outside. The paperwork appears to be in order at the border crossing. However, it is often impossible to determine their final destination.

Then, after being regrouped in the first country of entry, they continue to travel with new documents, posing as EU pets, and their true origins become unknown. Authorities have expressed particular concern for the rabies antibody titration certificate and other issues, including animal health and welfare, breeding conditions, and mutilation of tails, ears, and vocal cords. Illegal trade involves the systematic exploitation of dogs at all levels, from their place of origin and breeding facilities to post-purchase.

Over the last year, there has been a significant increase in online sales [242]. Criminals have exploited this trend, as it is impossible to conduct comprehensive screening, allowing offenders operating remotely to reach a large audience. Online selling and advertising contribute to the loss of traceability, as the information displayed in advertisements is often unverifiable. According to the EU [242], organized networks may sell thousands of animals, with some disguising their actions as rescue efforts. For example, a network of three sellers was reported to offer rescued dogs from all over Europe through more than 1000 unique ads across multiple websites, using just three phone numbers.

Online pet buyers often lack knowledge about the animals they purchase. It can be particularly challenging to determine the true source of a pet due to forged documents and misleading origin claims in advertisements. Although sellers may provide details such as the animal's microchip number, the parents' microchip number, and the breeder/seller's registration number, traceability cannot be ensured without prompt and accurate confirmation of their correspondence. International trade presents a challenge in terms of traceability due to the complex supply chains involving breeders, sellers, and transporters. The cross-border nature of these movements further complicates traceability due to varying legal systems, language barriers, and enforcement capacities across different countries.

Illegal traders are able to transport dogs across borders undetected if pet passports are not securely and irreversibly linked to individual microchips. By attaching the microchip to the animal's fur instead of injecting it, traceability and health guarantees for the dog are eliminated, making removal simple. This leads to alterations in the ownership, origin, and health information on the passports. Moreover, in many countries, the absence of mandatory dog identification and microchip registration in a database make it easier to obtain animals from unreliable or illegal sources.

Enforcement authorities cannot fully understand the extent of the problem and conduct successful investigations without a comprehensive and reliable database containing accurate and verified information on animals, breeders, and owners. Therefore, it is crucial to acknowledge the global nature of the issue and the illegal online trade of cats and dogs to effectively address the complexities involved.

Furthermore, engaging in criminal activities, such as committing fraud in the pet trade, comes at a surprisingly low cost. This is due to the significant difference between the potential high earnings and the relatively minor penalties imposed. In many cases, fines are relatively low, typically ranging from EUR 100 to EUR 300 for administrative fees per dog. However, even high fines do not deter the trade. The European Commission's report on illegal trade [242] provides an example of a breeder in Greece who was fined EUR 600,000. However, this did not prevent him from continuing his business.

The European Commission has recently proposed a regulation for the welfare of dogs and cats and their traceability [243]. The proposal includes a new feature that aims to make dogs and cats more traceable, particularly when they are sold or adopted online. According to the proposed regulations, all dogs and cats must be identified by electronically read transponders before they can be sold. This measure is expected to deter fraud and improve the oversight of animal welfare conditions.

## 5. Turning the Screw Even Further: The Unnecessary Cosmetic Modifications

Although practices such as cosmetic surgery, hair colouring, or even tattoos are outside the framework of selective breeding, they are closely related to owners' and breeders' preferences for certain aesthetic breed appearances and are therefore also discussed.



### 5.1. Trimming the Dog

Cosmetic surgery may be perceived as less risky than conventional surgery due to the typically young and healthy animals undergoing the procedure. However, these are still surgical interventions and carry the potential for anaesthetic risks, post-operative infections, pain, and the need for additional interventions if the desired outcome is not achieved, with both physiological and psychological impacts on the animal [244–246]. Therefore, the prohibition of cosmetic surgery on animals has become increasingly widespread, especially in Europe [247,248]. However, legislative standards vary between countries. In the EU, recent legislation has proposed to extend bans on mutilations through all the member states [243], which are supported and followed by European kennel club standards. However, in other countries, such as the USA, certain ear and tail conformations are required, which can only be achieved by cosmetic surgery. The American Kennel Club states that ‘*Ear cropping, tail docking [and dewclaw], as described in certain breed standards, are acceptable practices integral to defining and preserving breed character*’ [249]. Furthermore, the decision made by owners to modify their animals for aesthetic purposes is not only illegal and ethically questionable, but can also impact their ability to communicate and interact with other animals and humans, compromising their safety and welfare [245,250,251]. It may even affect owners’ abilities to accurately interpret their animals’ emotions, resulting in inappropriate responses to their dogs’ behaviour [252,253].

Tail docking and ear cropping are the most common aesthetic modifications performed on dogs. Throughout history, dogs have had their tails docked for various reasons, including superstitions, supposed health strategies to prevent disease, injury prevention at work, or even as a means of social distinction [254]. The aesthetic justification has been the last to appear, hand in hand with the breed standards [255], becoming standardised in the 20th century.

It is surprising to note that tail docking is not always carried out by a veterinarian, and anaesthesia is not always administered. Studies indicate that only 10% of veterinarians use anaesthetics or painkillers during tail docking [256]. Furthermore, in some countries, breeders and owners are permitted to perform tail docking, which may result in even lower usage of these drugs [257].

Similarly, the justification for ear cropping has evolved from injury prevention to the desired aesthetic appearance according to breed standards, such as the Doberman Pinscher or Pit Bull Terrier.

During the 20th century, interventions to alter the appearance of animals were so widespread that many people were unaware of their supposed benefits or reasons for being carried out. Some even believed that the altered appearance was natural and genetic, rather than the result of surgery [256].

The reasons may not have been clear, but the effects are devastating. Not only does it give dogs a fiercer and more aggressive appearance, but their owners are also perceived to have the same characteristics [256], so it could be considered that owners seek a reflection of these facets in their pets.

Another common surgical procedure is a removal or reduction in the vocal cords to decrease the volume of an animal’s bark, despite the fact that this behaviour can be redirected or corrected through training. In addition to chronic infections, respiratory problems, and pain [258], this procedure significantly impairs the animal’s ability to communicate. Devocalization does not eliminate the motivation or the behaviour itself; it only reduces the volume of barking. Instead of searching for the cause of the barking and addressing it, the animal is mistreated to prevent irritating the owner [259]. The reality is that dogs bark. It is a species-specific trait that has been valued by humans for thousands of years for its role in alarming animals or strangers [260], but dogs can be trained to communicate silently without being devocalized.

In 1987, the EU launch the European Convention for the Protection of Pet Animals (ETS No. 125) [247], banning ear cropping, declawing, and tail docking, with a “*Resolution on surgical operations in pet animals*” in 1995 “*to promote awareness particularly among judges,*

*breeders, veterinarians and keepers that [aesthetics] mutilation should not be carried out [and] to encourage breeding associations to amend breeding standards” [261] (p. 2). An EU-wide ban on ear cropping and tail docking, which are still allowed in a small number of member states, is also part of the Commission’s recent legislation proposal [243].*

Some other cosmetic surgeries are disguised as corrective surgeries, as they claim to address issues that arise as a result of diseases contracted by the animal. For instance, certain eye pathologies necessitate the removal of the eyeball, which can leave the animal with an appearance that may be shocking or unpleasant for its caregivers. In such cases, a silicone prosthesis may be inserted into the eye socket to enhance the animal’s appearance [262]. Similarly, testicular prostheses have been introduced in males to maintain the original aesthetic appearance after castration [263]. So, these interventions should be considered purely aesthetic because they do not provide any functional, physical, or psychological benefit to the animal. They may only be justified in preventing the breakdown of the human–animal bond, particularly when children are involved.

Other surgeries such as correcting skin wrinkles to prevent recurring skin infections, or correcting eyelids to avoid eye injuries, or performing soft palate surgeries in brachycephalic dogs with severe respiratory problems, which are in fact corrective surgeries, raise concerns as well. Nevertheless, they do not stem from the surgeries themselves, but rather from the fact that these issues could have been addressed at the breed level by modifying official standards.

### 5.2. *Mirroring Humans: Hair Dye, Tattoos, and the Like*

Humans use their appearance as a form of expression and communication to the world around them. However, extending this communicative function to animals can be problematic. Some owners choose to dye their animals’ hair, just as they would change their own hairstyle or hair colour. This is often performed for fun or economic reasons, but owners may not be aware that this practice can cause multiple respiratory problems [264] and hepatic damage [265,266].

Other forms of human expression include tattoos or piercings on different parts of the body, which can also be extended to our pets. These interventions should be considered acts of animal abuse, as they are painful procedures not required by the animals. They are usually performed without anaesthesia, increase the likelihood of infections [267], and can cause hypersensitivities [268] and self-mutilation through excessive licking.

## 6. Conclusions

The changing preferences and participation of dogs in today’s society, the lack of ethics in breeding and trade that prioritise animal health and welfare over economic benefit or mere aesthetic appearance, or the lack of real control over new marketing channels are putting animal health and welfare at risk.

A breeding system that solely focuses on selling price, supply and demand, or corporate profits systematically ignores health problems that could be genetically controlled or avoided, as well as behavioural problems that may arise from breeding and selling conditions or be conditioned by the genetic selection of parents. Kennel clubs, responsible for recognizing and registering purebred individuals, should not ignore this reality and must take a stance, as they are already doing so in the European Union, Norway, and the United Kingdom. Legislators should increase their awareness of the exploitation and abuse of animals in breeding and the pet trade, particularly in relation to puppy farms, internet sales, and international trade. They should promote regulations that effectively protect animals and reassure future owners that they are not contributing to animal suffering. Prospective pet owners should consider the options of adoption versus purchase to avoid contributing to an already exacerbated demand, and ultimately to responsibly ensure the conditions under which the animal they are buying has been bred and kept.

Although some countries such as Norway, the United Kingdom, and the European Union have recently introduced legislative initiatives to control breeding, trade, and aes-

thetic mutilations, these concerns are not yet widely shared among legislators, breeders, breed associations, let alone the general public. To curb the interest that criminal gangs are finding in this lucrative business, public registries of animals, breeders, and traders should be shared or made accessible by authorities in different countries. Additionally, the extension of unique microchip identification of animals and standardisation of legislation for transport and trade between countries would be beneficial.

However, perhaps the key is to influence the actors that determine market demand, acting on the information that veterinarians provide about the different breeds, breeders, and origins of the animals to be purchased, as well as on the media that can, unintentionally we assume, drive people crazy about a certain breed. This would extend the responsibility of the new owner beyond the current and future welfare of their newly acquired animal by making them aware of the origins, processes, and consequences of certain breeding and trading systems on the health and welfare of thousands of animals.

**Funding:** This research received no external funding.

**Conflicts of Interest:** The authors declare no conflicts of interest.

## References

- Vilà, C.; Savolainen, P.; Maldonado, J.E.; Amorim, I.R.; Rice, J.E.; Honeycutt, R.L.; Crandall, K.A.; Lundeberg, J.; Wayne, R.K. Multiple and Ancient Origins of the Domestic Dog. *Science* **1997**, *276*, 1687–1689. [[CrossRef](#)]
- Serpell, J.A. Commensalism or Cross-Species Adoption? A Critical Review of Theories of Wolf Domestication. *Front. Vet. Sci.* **2021**, *8*, 662370. [[CrossRef](#)]
- Hussain, S.T.; Weiss, M.; Nielsen, T.K. Being-with Other Predators: Cultural Negotiations of Neanderthal-Carnivore Relationships in Late Pleistocene Europe. *J. Anthropol. Archaeol.* **2022**, *66*, 101409. [[CrossRef](#)]
- Hobgood-Oster, L. *A Dog's History of the World: Canines and the Domestication of Humans*; Baylor University Press: Waco, TX, USA, 2014.
- Serpell, J. (Ed.) *The Domestic Dog: Its Evolution, Behavior and Interactions with People*, 2nd ed.; Cambridge University Press: New York, NY, USA, 2017; ISBN 978-1-107-02414-4.
- Sykes, N.; Beirne, P.; Horowitz, A.; Jones, I.; Kalof, L.; Karlsson, E.K.; King, T.; Litwak, H.; McDonald, R.A.; Murphy, L.J.; et al. Humanity's Best Friend: A Dog-Centric Approach to Addressing Global Challenges. *Animals* **2020**, *10*, 502. [[CrossRef](#)] [[PubMed](#)]
- Worboys, M. *The Invention of the Modern Dog: Breed and Blood in Victorian Britain*; Animals History Culture; Johns Hopkins University Press: Baltimore, MD, USA, 2018; ISBN 978-1-4214-2658-7.
- Udell, M.A.R. When Dogs Look Back: Inhibition of Independent Problem-Solving Behaviour in Domestic Dogs (*Canis lupus familiaris*) Compared with Wolves (*Canis lupus*). *Biol. Lett.* **2015**, *11*, 20150489. [[CrossRef](#)]
- Price, E.O. Behavioral Development in Animals Undergoing Domestication. *Appl. Anim. Behav. Sci.* **1999**, *65*, 245–271. [[CrossRef](#)]
- Clutton-Brock, J. Origins of the Dog: The Archaeological Evidence. In *The Domestic Dog: Its Evolution, Behavior and Interactions with People*; Serpell, J., Ed.; Cambridge University Press: Cambridge, UK, 2016; pp. 7–21.
- Hare, B.A.; Tomasello, M. The Emotional Reactivity Hypothesis and Cognitive Evolution Reply to Miklósi and Topál. *Trends Cogn. Sci.* **2005**, *9*, 464–465. [[CrossRef](#)]
- Apaolaza, V.; Hartmann, P.; Paredes, M.R.; Trujillo, A.; D'Souza, C. What Motivates Consumers to Buy Fashion Pet Clothing? The Role of Attachment, Pet Anthropomorphism, and Self-Expansion. *J. Bus. Res.* **2021**, *37*, 367–379. [[CrossRef](#)]
- Ghirlanda, S.; Acerbi, A.; Herzog, H.A.; Serpell, J.A. Fashion vs. Function in Cultural Evolution: The Case of Dog Breed Popularity. *PLoS ONE* **2013**, *8*, e74770. [[CrossRef](#)]
- Donner, J.; Kaukonen, M.; Anderson, H.; Möller, F.; Kyöstilä, K.; Sankari, S.G.; Hytönen, M.K.; Giger, U.; Lohi, H. Genetic Panel Screening of Nearly 100 Mutations Reveals New Insights into the Breed Distribution of Risk Variants for Canine Hereditary Disorders. *PLoS ONE* **2016**, *11*, e0161005. [[CrossRef](#)]
- Ostrander, E.A.; Wayne, R.K.; Freedman, A.H.; Davis, B.W. Demographic History, Selection and Functional Diversity of the Canine Genome. *Nat. Rev. Genet.* **2017**, *18*, 705–720. [[CrossRef](#)]
- Crone, C.C. Turning up the Volume on Man's Best Friend: Ethical Issues Associated with Commercial Dog Breeding. *J. Appl. Anim. Ethics Res.* **2019**, *1*, 230–252. [[CrossRef](#)]
- Hladky-Krage, B.; Hoffman, C.L. Expectations versus Reality of Designer Dog Ownership in the United States. *Animals* **2022**, *12*, 3247. [[CrossRef](#)]
- Axelsson, E.; Ljungvall, I.; Bhoumik, P.; Conn, L.B.; Murén, E.; Ohlsson, Å.; Olsen, L.H.; Engdahl, K.; Hagman, R.; Hanson, J.; et al. The Genetic Consequences of Dog Breed Formation—Accumulation of Deleterious Genetic Variation and Fixation of Mutations Associated with Myxomatous Mitral Valve Disease in Cavalier King Charles Spaniels. *PLoS Genet.* **2021**, *17*, e1009726. [[CrossRef](#)] [[PubMed](#)]

19. Freedman, A.H.; Lohmueller, K.E.; Wayne, R.K. Evolutionary History, Selective Sweeps, and Deleterious Variation in the Dog. *Annu. Rev. Ecol. Evol. Syst.* **2016**, *47*, 73–96. [[CrossRef](#)]
20. Stacy, M. The 9 Oldest Dog Breeds (One Might Be 10,000 Years Old!). A-Z Animals. 2021. Available online: <https://a-z-animals.com/blog/the-9-oldest-dog-breeds/> (accessed on 18 January 2024).
21. American Kennel Club Dog Breeds—Types of Dogs. Available online: <https://www.akc.org/dog-breeds/> (accessed on 18 January 2024).
22. Northrup, J. Oldest Dog Breeds: List Of 14 Ancient Dog Breeds. Animal Hearted. 2023. Available online: <https://www.animalhearted.com/blogs/dogs/ancient-dog-breeds> (accessed on 18 January 2024).
23. Audette, J. 11 Most Ancient Dog Breeds on Earth. Canine Campus Dog Daycare Board. 2023. Available online: <https://www.caninecampus.us/11-most-ancient-dog-breeds-on-earth> (accessed on 18 January 2024).
24. Wayne, R.K.; Ostrander, E.A. Origin, Genetic Diversity, and Genome Structure of the Domestic Dog. *BioEssays* **1999**, *21*, 247–257. [[CrossRef](#)]
25. Larson, G.; Karlsson, E.K.; Perri, A.R.; Webster, M.T.; Ho, S.Y.W.; Peters, J.; Stahl, P.W.; Piper, P.J.; Lingaas, F.; Fredholm, M.; et al. Rethinking Dog Domestication by Integrating Genetics, Archeology, and Biogeography. *Proc. Natl. Acad. Sci. USA* **2012**, *109*, 8878–8883. [[CrossRef](#)]
26. Asher, L.; Collins, L.M.; Ortiz-Pelaez, A.; Drewe, J.A.; Nicol, C.J.; Pfeiffer, D.U. Recent Advances in the Analysis of Behavioural Organization and Interpretation as Indicators of Animal Welfare. *J. R. Soc. Interface* **2009**, *6*, 1103–1119. [[CrossRef](#)] [[PubMed](#)]
27. FCI Federation Cynologique Internationale. Available online: <https://fci.be/en/Presentation-of-our-organisation-4.html> (accessed on 18 January 2024).
28. Lazzaroni, M.; Range, F.; Backes, J.; Portele, K.; Scheck, K.; Marshall-Pescini, S. The Effect of Domestication and Experience on the Social Interaction of Dogs and Wolves with a Human Companion. *Front. Psychol.* **2020**, *11*, 785. [[CrossRef](#)]
29. Cooper, J.J.; Ashton, C.F.; Bishop, S.; West, R.E.; Mills, D.S.; Young, R.J. Clever Hounds: Social Cognition in the Domestic Dog (*Canis familiaris*). *Appl. Anim. Behav. Sci.* **2003**, *81*, 229–244. [[CrossRef](#)]
30. Hare, B.A.; Brown, M.; Williamson, C.; Tomasello, M. The Domestication of Social Cognition in Dogs. *Science* **2002**, *298*, 1634–1636. [[CrossRef](#)] [[PubMed](#)]
31. Miklósi, Á.; Kubinyi, E.; Topál, J.; Gácsi, M.; Viranyi, Z.; Csányi, V. A Simple Reason for a Big Difference Wolves Do Not Look Back at Humans, but Dogs Do. *Curr. Biol.* **2003**, *13*, 763–766. [[CrossRef](#)]
32. Téglás, E.; Gergely, A.; Kupán, K.; Miklósi, Á.; Topál, J. Dogs’ Gaze Following Is Tuned to Human Communicative Signals. *Curr. Biol.* **2012**, *22*, 209–212. [[CrossRef](#)]
33. Viranyi, Z.; Topál, J.; Gácsi, M.; Miklósi, Á.; Csányi, V. Dogs Respond Appropriately to Cues of Humans’ Attentional Focus. *Behav. Process.* **2004**, *66*, 161–172. [[CrossRef](#)]
34. Gácsi, M.; Miklósi, Á.; Varga, O.; Topál, J.; Csányi, V. Are Readers of Our Face Readers of Our Minds? Dogs (*Canis familiaris*) Show Situation-Dependent Recognition of Human’s Attention. *Anim. Cogn.* **2004**, *7*, 144–153. [[CrossRef](#)] [[PubMed](#)]
35. Archer, J.; Monton, S. Preferences for Infant Facial Features in Pet Dogs and Cats. *Ethology* **2011**, *117*, 217–226. [[CrossRef](#)]
36. Waller, B.M.; Peirce, K.; Caeiro, C.; Scheider, L.; Burrows, A.M.; McCune, S.; Kaminski, J. Paedomorphic Facial Expressions Give Dogs a Selective Advantage. *PLoS ONE* **2013**, *8*, e82686. [[CrossRef](#)] [[PubMed](#)]
37. Mitze, S.; Barrs, V.R.; Beatty, J.A.; Hobi, S.; Bęczkowski, P.M. Brachycephalic Obstructive Airway Syndrome: Much More than a Surgical Problem. *Vet. Q.* **2022**, *42*, 213–223. [[CrossRef](#)]
38. Packer, R.M.A.; Hendricks, A.; Volk, H.A.; Shihab, N.K.; Burn, C.C. How Long and Low Can You Go? Effect of Conformation on the Risk of Thoracolumbar Intervertebral Disc Extrusion in Domestic Dogs. *PLoS ONE* **2013**, *8*, e69650. [[CrossRef](#)]
39. Packer, R.M.A.; Seath, I.J.; O’Neill, D.G.; Decker, S.D.; Volk, H.A. DachshundLife 2015: An Investigation of Lifestyle Associations with the Risk of Intervertebral Disc Disease in Dachshunds. *Canine Genet. Epidemiol.* **2016**, *3*, 8. [[CrossRef](#)]
40. Gazzano, A.; Lauría, C.; Ducci, M.; Sighieri, C. Dog Attention and Cooperation with the Owner: Preliminary Results about Brachycephalic Dogs. *Dog Behav.* **2015**, *1*, 1–7.
41. Goodwin, D.; Bradshaw, J.W.S.; Wickens, S.M. Paedomorphosis Affects Agonistic Visual Signals of Domestic Dogs. *Anim. Behav.* **1997**, *53*, 297–304. [[CrossRef](#)]
42. Kerswell, K.J.; Butler, K.L.; Bennett, P.C.; Hemsworth, P.H. The Relationships between Morphological Features and Social Signalling Behaviours in Juvenile Dogs: The Effect of Early Experience with Dogs of Different Morphotypes. *Behav. Process.* **2010**, *85*, 1–7. [[CrossRef](#)]
43. Morey, D.F. The Early Evolution of the Domestic Dog. *Am. Sci.* **1994**, *82*, 336.
44. Wheat, C.H.; van der Bijl, W.; Temrin, H. Dogs, but Not Wolves, Lose Their Sensitivity Toward Novelty with Age. *Front. Psychol.* **2018**, *10*. [[CrossRef](#)]
45. Range, F.; Marshall-Pescini, S. Comparing Wolves and Dogs: Current Status and Implications for Human ‘Self-Domestication’. *Trends Cogn. Sci.* **2022**, *26*, 337–349. [[CrossRef](#)]
46. Marshall-Pescini, S.; Schwarz, J.F.L.; Kostelnik, I.; Viranyi, Z.; Range, F. Importance of a Species’ Socioecology: Wolves Outperform Dogs in a Conspecific Cooperation Task. *Proc. Natl. Acad. Sci. USA* **2017**, *114*, 11793–11798. [[CrossRef](#)]
47. Asher, L.; Diesel, G.; Summers, J.; McGreevy, P.D.; Collins, L.M. Inherited Defects in Pedigree Dogs. Part 1: Disorders Related to Breed Standards. *Vet. J.* **2009**, *182*, 402–411. [[CrossRef](#)]



48. Mikkola, L.; Kyöstilä, K.; Donner, J.; Lappalainen, A.K.; Hytönen, M.K.; Lohi, H.; Iivanainen, A. An Across-Breed Validation Study of 46 Genetic Markers in Canine Hip Dysplasia. *BMC Genomics* **2021**, *22*, 68. [[CrossRef](#)]
49. Fels, L.; Distl, O. Identification and Validation of Quantitative Trait Loci (QTL) for Canine Hip Dysplasia (CHD) in German Shepherd Dogs. *PLoS ONE* **2014**, *9*, e96618. [[CrossRef](#)]
50. Clark, L.A.; Wahl, J.M.; Steiner, J.M.; Zhou, W.; Ji, W.; Famula, T.R.; Williams, D.A.; Murphy, K.E. Linkage Analysis and Gene Expression Profile of Pancreatic Acinar Atrophy in the German Shepherd Dog. *Mamm. Genome* **2005**, *16*, 955–962. [[CrossRef](#)]
51. Clark, L.A.; Cox, M.L. Current Status of Genetic Studies of Exocrine Pancreatic Insufficiency in Dogs. *Top. Companion Anim. Med.* **2012**, *27*, 109–112. [[CrossRef](#)]
52. Ondreka, N.; Amort, K.H.; Stock, K.F.; Tellhelm, B.; Klumpp, S.; Kramer, M.; Schmidt, M.J. Skeletal Morphology and Morphometry of the Lumbosacral Junction in German Shepherd Dogs and an Evaluation of the Possible Genetic Basis for Radiographic Findings. *Vet. J.* **2013**, *196*, 64–70. [[CrossRef](#)]
53. Gluding, D.; Stock, K.F.; Tellhelm, B.; Kramer, M.; Eley, N. Genetic Background of Lumbosacral Transitional Vertebrae in German Shepherd Dogs. *J. Small Anim. Pract.* **2021**, *62*, 967–972. [[CrossRef](#)]
54. Harvey, N.D.; Shaw, S.C.; Craigon, P.J.; Blott, S.C.; England, G.C.W. Environmental Risk Factors for Canine Atopic Dermatitis: A Retrospective Large-Scale Study in Labrador and Golden Retrievers. *Vet. Dermatol.* **2019**, *30*, 396–e119. [[CrossRef](#)]
55. Famula, T.R.; Siemens, L.M.; Davidson, A.P.; Packard, M. Evaluation of the Genetic Basis of Tricuspid Valve Dysplasia in Labrador Retrievers. *Am. J. Vet. Res.* **2002**, *63*, 816–820. [[CrossRef](#)]
56. Lake-Bakaar, G.A.; Griffiths, L.G.; Kittleson, M.D. Title Balloon Valvuloplasty of Tricuspid Stenosis: A Retrospective Study of 5 Labrador Retriever Dogs Permalink. *J. Vet. Intern. Med.* **2017**, *31*, 311–315. [[CrossRef](#)]
57. Hoffmann, G.; Van Den Ingh, T.S.; Bode, P.; Rothuizen, J. Copper-Associated Chronic Hepatitis in Labrador Retrievers. *J. Vet. Intern. Med.* **2006**, *20*, 856–861.
58. Hardwick, L.J.A.; Kortum, A.J.; Constantino-Casas, F.; Watson, P.J. Breed-Related Expression Patterns of Ki67,  $\gamma$ H2AX, and P21 during Ageing in the Canine Liver. *Vet. Res. Commun.* **2020**, *45*, 21–30. [[CrossRef](#)]
59. Clark, R.D. *Medical, Genetic & Behavioral Risk Factors of the Terrier Breeds*; Xlibris LLC: Bloomington, IN, USA, 2017; ISBN 978-1-5245-8470-2.
60. Erlen, A.; Potschka, H.; Volk, H.A.; Sauter-Louis, C.M.; O'Neill, D.G. Seizure Occurrence in Dogs under Primary Veterinary Care in the UK: Prevalence and Risk Factors. *J. Vet. Intern. Med.* **2018**, *32*, 1665–1676. [[CrossRef](#)]
61. Brambilla, P.G.; Polli, M.; Pradelli, D.; Papa, M.; Rizzi, R.; Bagardi, M.; Bussadori, C.M. Epidemiological Study of Congenital Heart Diseases in Dogs: Prevalence, Popularity, and Volatility throughout Twenty Years of Clinical Practice. *PLoS ONE* **2020**, *15*, e0230160. [[CrossRef](#)]
62. Wiles, B.M.; Llewellyn-Zaidi, A.; Evans, K.M.; O'Neill, D.G.; Lewis, T.W. Large-Scale Survey to Estimate the Prevalence of Disorders for 192 Kennel Club Registered Breeds. *Canine Genet. Epidemiol.* **2017**, *4*, 8. [[CrossRef](#)]
63. Krainer, D.; Dupré, G. Brachycephalic Obstructive Airway Syndrome. *Vet. Clin. North Am. Small Anim. Pract.* **2022**, *52*, 749–780. [[CrossRef](#)]
64. O'Neill, D.G.; O'Sullivan, A.M.; Manson, E.A.; Church, D.B.; Boag, A.; McGreevy, P.D.; Brodbelt, D.C. Canine Dystocia in 50 UK First-Opinion Emergency-Care Veterinary Practices: Prevalence and Risk Factors. *Vet. Rec.* **2017**, *181*, 88. [[CrossRef](#)]
65. O'Neill, D.G.; Lee, M.M.; Brodbelt, D.C.; Church, D.B.; Sanchez, R.F. Corneal Ulcerative Disease in Dogs under Primary Veterinary Care in England: Epidemiology and Clinical Management. *Canine Genet. Epidemiol.* **2017**, *4*, 5. [[CrossRef](#)]
66. Paster, E.R.; Lafond, E.; Biery, D.N.; Iriye, A.; Gregor, T.P.; Shofer, F.S.; Smith, G.K. Estimates of Prevalence of Hip Dysplasia in Golden Retrievers and Rottweilers and the Influence of Bias on Published Prevalence Figures. *J. Am. Vet. Med. Assoc.* **2005**, *226*, 387–392. [[CrossRef](#)]
67. Leighton, E.A.; Holle, D.M.; Biery, D.N.; Gregor, T.P.; McDonald-Lynch, M.B.; Wallace, M.L.; Reagan, J.K.; Smith, G.K. Genetic Improvement of Hip-Extended Scores in 3 Breeds of Guide Dogs Using Estimated Breeding Values: Notable Progress but More Improvement Is Needed. *PLoS ONE* **2019**, *14*, e0212544. [[CrossRef](#)]
68. Lavrijsen, I.C.M.; Heuven, H.C.M.; Heuven, H.C.M.; Voorhout, G.; Meij, B.P.; Theyse, L.F.H.; Leegwater, P.A.J.; Hazewinkel, H.A.W. Phenotypic and Genetic Evaluation of Elbow Dysplasia in Dutch Labrador Retrievers, Golden Retrievers, and Bernese Mountain Dogs. *Vet. J.* **2012**, *193*, 486–492. [[CrossRef](#)]
69. O'Neill, D.G.; Brodbelt, D.C.; Hodge, R.; Church, D.B.; Meeson, R.L. Epidemiology and Clinical Management of Elbow Joint Disease in Dogs under Primary Veterinary Care in the UK. *Canine Med. Genet.* **2020**, *7*, 1. [[CrossRef](#)]
70. Minors, S.L.; O'Grady, M.R.; Williams, R.M.; O'Sullivan, M.L. Clinical and Echocardiographic Features of Primary Infundibular Stenosis with Intact Ventricular Septum in Dogs. *J. Vet. Intern. Med.* **2006**, *20*, 1344–1350. [[CrossRef](#)]
71. Schober, K.E.; Rhinehart, J.D.; Kohnken, R.; Bonagura, J.D. Cutting Balloon and High-Pressure Balloon Dilation for Palliative Treatment of Congenital Double-Chambered Right Ventricle and Primary Infundibular Stenosis in a Golden Retriever Dog. *J. Vet. Cardiol. Off. J. Eur. Soc. Vet. Cardiol.* **2017**, *19*, 538–546. [[CrossRef](#)]
72. O'Neill, D.G.; Skipper, A.; Packer, R.M.A.; Lacey, C.; Brodbelt, D.C.; Church, D.B.; Pegram, C.L. English Bulldogs in the UK: A VetCompass Study of Their Disorder Predispositions and Protections. *Canine Med. Genet.* **2022**, *9*, 5. [[CrossRef](#)]
73. O'Neill, D.G.; Yin, Y.; Pont, R.T.; Brodbelt, D.C.; Church, D.B.; Pegram, C.L.; Mustikka, M.P. Breed and Conformational Predispositions for Prolapsed Nictitating Membrane Gland (PNMG) in Dogs in the UK: A VetCompass Study. *PLoS ONE* **2022**, *17*, e0260538. [[CrossRef](#)]



74. Patel, H.A.; Saiyad, S.; Rao, N. Common Health Issues Related to Brachycephalic Dogs. *Pharma Innov.* **2022**, *11*, 786–796.
75. Davidson, A.G.; Bell, R.J.; Lees, G.E.; Kashtan, C.E.; Davidson, G.S.; Murphy, K.E. Genetic Cause of Autosomal Recessive Hereditary Nephropathy in the English Cocker Spaniel. *J. Vet. Intern. Med.* **2007**, *21*, 394–401. [[CrossRef](#)]
76. de Brot, S.; Adamany, J.L.; Baiker, K.; Dhumeaux, M.P.; Allegrucci, C.; Polledo, L.; Grau-Roma, L. Pathology in Practice. Hereditary Nephropathy (Familial Nephropathy) in an English Cocker Spaniel. *J. Am. Vet. Med. Assoc.* **2017**, *251*, 661–664. [[CrossRef](#)]
77. Park, S.; Casanova, M.I.; Bannasch, D.L.; Daley, N.L.; Kim, S.; Kuchtey, J.; Gomes, F.E.; Leonard, B.C.; Good, K.L.; Martins, B.C.; et al. Ocular Morphologic Traits in the American Cocker Spaniel May Confer Primary Angle Closure Glaucoma Susceptibility. *Sci. Rep.* **2022**, *12*, 18980. [[CrossRef](#)]
78. Petersen, T.; Proschowsky, H.F.; Hardon, T.; Rasch, S.N.; Fredholm, M. Prevalence and Heritability of Distichiasis in the English Cocker Spaniel. *Canine Genet. Epidemiol.* **2015**, *2*, 11. [[CrossRef](#)]
79. Jondeau, C.; Gounon, M.; Bourguet, A.; Chahory, S. Epidemiology and Clinical Significance of Canine Distichiasis: A Retrospective Study of 291 Cases. *Vet. Ophthalmol.* **2023**, *26*, 339–346. [[CrossRef](#)]
80. Bader, H.L.; Ruhe, A.L.; Wang, L.W.; Wong, A.K.; Walsh, K.F.; Packer, R.A.; Mitelman, J.; Robertson, K.R.; O'Brien, D.P.; Broman, K.W.; et al. An ADAMTSL2 Founder Mutation Causes Musladin-Lueke Syndrome, a Heritable Disorder of Beagle Dogs, Featuring Stiff Skin and Joint Contractures. *PLoS ONE* **2010**, *5*, e12817. [[CrossRef](#)]
81. Forman, O.P.; Risio, L.D.; Stewart, J.; Mellersh, C.; Beltran, E. Genome-Wide mRNA Sequencing of a Single Canine Cerebellar Cortical Degeneration Case Leads to the Identification of a Disease Associated SPTBN2 Mutation. *BMC Genet.* **2012**, *13*, 55. [[CrossRef](#)]
82. Zeng, R.; Coates, J.R.; Johnson, G.C.; Hansen, L.; Awano, T.; Kolichieski, A.; Ivansson, E.; Perloski, M.; Lindblad-Toh, K.; Lindblad-Toh, K.; et al. Breed Distribution of SOD1 Alleles Previously Associated with Canine Degenerative Myelopathy. *J. Vet. Intern. Med.* **2014**, *28*, 515–521. [[CrossRef](#)]
83. Pegram, C.L.; Brodbelt, D.C.; Diaz-Ordaz, K.; Chang, Y.; von Hekkel, A.F.; Church, D.B.; O'Neill, D.G. Risk Factors for Unilateral Cranial Cruciate Ligament Rupture Diagnosis and for Clinical Management in Dogs under Primary Veterinary Care in the UK. *Vet. J.* **2023**, *292*, 105952. [[CrossRef](#)]
84. Cocsfirc, V.; Pastiu, A.I.; Dobosi, A.-A.; Lucaci, F.D.; Turcu, M.-C.; Borzan, M.; Pusta, D.L. Molecular Surveillance of Canine Degenerative Myelopathy in Breeding Kennels from Romania. *Animals* **2023**, *13*, 1403. [[CrossRef](#)]
85. Lavrijsen, I.C.M.; Heuven, H.C.M.; Heuven, H.C.M.; Meij, B.P.; Theyse, L.F.H.; Nap, R.C.; Leegwater, P.A.; Hazewinkel, H.A.W. Prevalence and Co-Occurrence of Hip Dysplasia and Elbow Dysplasia in Dutch Pure-Bred Dogs. *Prev. Vet. Med.* **2014**, *114*, 114–122. [[CrossRef](#)]
86. Bergknut, N.; Egenvall, A.; Hagman, R.; Gustås, P.; Hazewinkel, H.A.W.; Meij, B.P.; Lagerstedt, A.S. Incidence of Intervertebral Disk Degeneration-Related Diseases and Associated Mortality Rates in Dogs. *J. Am. Vet. Med. Assoc.* **2012**, *240*, 1300–1309. [[CrossRef](#)]
87. Poli, F.; Calistri, M.; Meucci, V.; Gennaro, G.D.; Baroni, M. Prevalence, Clinical Features, and Outcome of Intervertebral Disc Extrusion Associated with Extensive Epidural Hemorrhage in a Population of French Bulldogs Compared to Dachshunds. *J. Vet. Med. Sci.* **2022**, *84*, 1307–1312. [[CrossRef](#)]
88. O'Brien, M.J.; Beijerink, N.J.; Wade, C.M. Genetics of Canine Myxomatous Mitral Valve Disease. *Anim. Genet.* **2021**, *52*, 409–421. [[CrossRef](#)]
89. Nakazawa, M.; Miyamae, J.; Okano, M.; Kanemoto, H.; Katakura, F.; Shiina, T.; Ohno, K.; Tsujimoto, H.; Moritomo, T.; Watari, T. Dog Leukocyte Antigen (DLA) Class II Genotypes Associated with Chronic Enteropathy in French Bulldogs and Miniature Dachshunds. *Vet. Immunol. Immunopathol.* **2021**, *237*, 110271. [[CrossRef](#)]
90. Rusbridge, C. *Behavioural and Clinical Signs of Chiari-like Malformation and Syringomyelia in Cavalier King Charles Spaniels*; BSAVA Library: Gloucester, UK, 2018.
91. Hülsmeier, V.; Fischer, A.; Mandigers, P.J.J.; DeRisio, L.; Berendt, M.; Rusbridge, C.; Bhatti, S.F.M.; Pákozdy, Á.; Patterson, E.E.; Platt, S.R.; et al. International Veterinary Epilepsy Task Force's Current Understanding of Idiopathic Epilepsy of Genetic or Suspected Genetic Origin in Purebred Dogs. *BMC Vet. Res.* **2015**, *11*, 175. [[CrossRef](#)]
92. Motta, L.; Altay, U.M.; Skerriitt, G.C. Bell's Palsy with Concomitant Idiopathic Cranial Nerve Polyneuropathy in Seven Dogs. *J. Small Anim. Pract.* **2011**, *52*, 397. [[CrossRef](#)]
93. Nishida, H.; Nakata, K.; Maeda, S.; Kamishina, H. Prevalence and Pattern of Thoracolumbar Caudal Articular Process Anomalies and Intervertebral Disk Herniations in Pugs. *J. Vet. Med. Sci.* **2019**, *81*, 906–910. [[CrossRef](#)]
94. Hillbertz, N.S.; Andersson, G. Autosomal Dominant Mutation Causing the Dorsal Ridge Predisposes for Dermoid Sinus in Rhodesian Ridgeback Dogs. *J. Small Anim. Pract.* **2006**, *47*, 184–188. [[CrossRef](#)]
95. Meurs, K.M.; Weidman, J.A.; Rosenthal, S.L.; Lahmers, K.K.; Friedenber, S.G. Ventricular Arrhythmias in Rhodesian Ridgebacks with a Family History of Sudden Death and Results of a Pedigree Analysis for Potential Inheritance Patterns. *J. Am. Vet. Med. Assoc.* **2016**, *248*, 1135–1138. [[CrossRef](#)]
96. Cline, A. The Genetics of Deafness in Dalmatians. *Microreviews Cell Mol. Biol.* **2012**, *1*, 130–131.
97. Webb, A.A.; Cullen, C.L. Coat Color and Coat Color Pattern-Related Neurologic and Neuro-Ophthalmic Diseases. *Can. Vet. J. Rev. Vet. Can.* **2010**, *51*, 653–657.

98. Lampi, S.; Donner, J.; Anderson, H.; Pohjoismäki, J.L.O. Variation in Breeding Practices and Geographic Isolation Drive Subpopulation Differentiation, Contributing to the Loss of Genetic Diversity within Dog Breed Lineages. *Canine Med. Genet.* **2020**, *7*, 5. [CrossRef]
99. Leroy, G. Genetic Diversity, Inbreeding and Breeding Practices in Dogs: Results from Pedigree Analyses. *Vet. J.* **2011**, *189*, 177–182. [CrossRef]
100. Mellanby, R.J.; Ogden, R.; Clements, D.N.; French, A.T.; Gow, A.G.; Powell, R.M.; Corcoran, B.; Schoeman, J.P.; Summers, K.M. Population Structure and Genetic Heterogeneity in Popular Dog Breeds in the UK. *Vet. J.* **2013**, *196*, 92–97. [CrossRef]
101. Club, T.K. Rhodesian Ridgeback/Breed Standards. Available online: <https://www.thekennelclub.org.uk/breed-standards/hound/rhodesian-ridgeback/> (accessed on 18 January 2024).
102. Henley, W.E.; Wood, J.L.N. One Hundred and One Dalmatians—The Importance of Being “Patch”? *Vet. J.* **2003**, *166*, 105–106. [CrossRef]
103. UFAW Genetic Welfare Problems of Companion Animals. 2023. Available online: <https://www.ufaw.org.uk/dogs/dogs> (accessed on 18 January 2024).
104. Hecht, J.; Horowitz, A. Seeing Dogs: Human Preferences for Dog Physical Attributes. *Anthrozoös* **2015**, *28*, 153–163. [CrossRef]
105. Weiss, E.; Miller, K.A.; Mohan-Gibbons, H.; Vela, C. Why Did You Choose This Pet? Adopters and Pet Selection Preferences in Five Animal Shelters in the United States. *Animals* **2012**, *2*, 144–159. [CrossRef]
106. Diverio, S.; Boccini, B.; Menchetti, L.; Bennett, P.C. The Italian Perception of the Ideal Companion Dog. *J. Vet. Behav. Clin. Appl. Res.* **2016**, *12*, 27–35. [CrossRef]
107. King, T.; Marston, L.C.; Bennett, P.C. Describing the Ideal Australian Companion Dog. *Appl. Anim. Behav. Sci.* **2009**, *120*, 84–93. [CrossRef]
108. Packer, R.M.A.; Murphy, D.; Farnworth, M.J. Purchasing Popular Purebreds: Investigating the Influence of Breed-Type on the Pre-Purchase Motivations and Behaviour of Dog Owners. *Anim. Welf.* **2017**, *26*, 191–201. [CrossRef]
109. Lorenz, K.Z. *Part and Parcel in Animal and Human Societies (1950); A Methodological Discussion*; Harvard University Press: Cambridge, MA, USA, 1971.
110. Kringelbach, M.L.; Stark, E.A.; Alexander, C.M.; Bornstein, M.H.; Stein, A.G. On Cuteness: Unlocking the Parental Brain and Beyond. *Trends Cogn. Sci.* **2016**, *20*, 545–558. [CrossRef]
111. Herzog, H.A. Forty-Two Thousand and One Dalmatians: Fads, Social Contagion, and Dog Breed Popularity. *Soc. Anim.* **2006**, *14*, 383–397. [CrossRef]
112. Herzog, H.A.; Elias, S.M. Effects of Winning the Westminster Kennel Club Dog Show on Breed Popularity. *J. Am. Vet. Med. Assoc.* **2004**, *225*, 365–367. [CrossRef]
113. Costa, J.; Steinmetz, A.; Delgado, E. Clinical Signs of Brachycephalic Ocular Syndrome in 93 Dogs. *Irish Vet. J.* **2021**, *74*, 3. [CrossRef]
114. O’Neill, D.G.; Jackson, C.; Guy, J.H.; Church, D.B.; McGreevy, P.D.; Thomson, P.C.; Brodbelt, D.C. Epidemiological Associations between Brachycephaly and Upper Respiratory Tract Disorders in Dogs Attending Veterinary Practices in England. *Canine Genet. Epidemiol.* **2015**, *2*, 10. [CrossRef]
115. Ryan, R.; Gutierrez-Quintana, R.; ter Haar, G.; Decker, S.D. Prevalence of Thoracic Vertebral Malformations in French Bulldogs, Pugs and English Bulldogs with and without Associated Neurological Deficits. *Vet. J.* **2017**, *221*, 25–29. [CrossRef]
116. Farrow, T.; Keown, A.J.; Farnworth, M.J. An Exploration of Attitudes towards Pedigree Dogs and Their Disorders as Expressed by a Sample of Companion Animal Veterinarians in New Zealand. *N. Z. Vet. J.* **2014**, *62*, 267–273. [CrossRef]
117. Godden, R. *The Butterfly Lions: The Story of the Pekingese in History, Legend, and Art*; A Studio Book; Viking: New York, NY, USA, 1978; ISBN 978-0-670-19788-0.
118. Amiot, C.E.; Bastian, B. Toward a Psychology of Human-Animal Relations. *Psychol. Bull.* **2015**, *141*, 6–47. [CrossRef]
119. Curb, L.A.; Abramson, C.I.; Grice, J.W.; Kennison, S.M. The Relationship between Personality Match and Pet Satisfaction among Dog Owners. *Anthrozoös* **2013**, *26*, 395–404. [CrossRef]
120. McConnell, A.R.; Brown, C.M.; Shoda, T.M.; Stayton, L.E.; Martin, C.E. Friends with Benefits: On the Positive Consequences of Pet Ownership. *J. Personal. Soc. Psychol.* **2011**, *101*, 1239–1252. [CrossRef]
121. Packer, R.M.A.; Hendricks, A.; Tivers, M.S.; Burn, C.C. Impact of Facial Conformation on Canine Health: Brachycephalic Obstructive Airway Syndrome. *PLoS ONE* **2015**, *10*, e0137496. [CrossRef]
122. Townsend, W.; Bedford, P.; Jones, G. Abnormal Appearance. In *Small Animal Ophthalmology*; Elsevier: Amsterdam, The Netherlands, 2009; pp. 67–115. ISBN 978-0-7020-2861-8.
123. Maggs, D.J.; Miller, P.E.; Ofri, R.; Slatter, D.H. *Slatter’s Fundamentals of Veterinary Ophthalmology*, 5th ed.; Elsevier: St. Louis, MO, USA, 2013; ISBN 978-1-4377-2367-0.
124. Renwick, P.W. Diagnosis and Treatment of Corneal Disorders in Dogs. *Practice* **1996**, *18*, 315–328. [CrossRef]
125. Club, A.K. Dachshund Dog Breed Information. American Kennel Club. 2023. Available online: <https://www.akc.org/dog-breeds/dachshund/> (accessed on 10 January 2024).
126. Brisson, B.A. Intervertebral Disc Disease in Dogs. *Vet. Clin. North America. Small Anim. Pract.* **2010**, *40*, 829–858. [CrossRef]
127. Fehlings, M.G.; Tetreault, L.A.; Wilson, J.R.; Kwon, B.K.; Burns, A.S.; Martin, A.R.; Hawryluk, G.W.J.; Harrop, J.S. A Clinical Practice Guideline for the Management of Acute Spinal Cord Injury: Introduction, Rationale, and Scope. *Glob. Spine J.* **2017**, *7*, 84S–94S. [CrossRef]

128. Fenn, J.; Olby, N.J. Canine Spinal Cord Injury Consortium. Classification of Intervertebral Disc Disease. *Front. Vet. Sci.* **2020**, *7*, 579025. [[CrossRef](#)]
129. Dickinson, P.J.; Bannasch, D.L. Current Understanding of the Genetics of Intervertebral Disc Degeneration. *Front. Vet. Sci.* **2020**, *7*, 431. [[CrossRef](#)] [[PubMed](#)]
130. Paterson, S. Intertrigo in the Dog: Aetiology, Clinical Signs and Therapy. *Companion Anim.* **2017**, *22*, 72–77. [[CrossRef](#)]
131. Hobi, S.; Barrs, V.R.; Bęczkowski, P.M. Dermatological Problems of Brachycephalic Dogs. *Animals* **2023**, *13*, 2016. [[CrossRef](#)] [[PubMed](#)]
132. Mooney, J.A.; Yohannes, A.; Lohmueller, K.E. The Impact of Identity-by-Descent on Fitness and Disease in Natural and Domesticated Canid Populations. *BioRxiv* **2020**, 2020, 11. [[CrossRef](#)]
133. Machová, K.; Kranjčevićová, A.; Vostrý, L.; Krupa, E. Analysis of Genetic Diversity in the Czech Spotted Dog. *Animals* **2020**, *10*, 1416. [[CrossRef](#)] [[PubMed](#)]
134. Ács, V.; Bokor, Á.; Nagy, I. Population Structure Analysis of the Border Collie Dog Breed in Hungary. *Animals* **2019**, *9*, 250. [[CrossRef](#)] [[PubMed](#)]
135. Jansson, M.; Laikre, L. Pedigree Data Indicate Rapid Inbreeding and Loss of Genetic Diversity within Populations of Native, Traditional Dog Breeds of Conservation Concern. *PLoS ONE* **2018**, *13*, e0202849. [[CrossRef](#)]
136. Zajc, I.; Mellersh, C.; Sampson, J. Variability of Canine Microsatellites within and between Different Dog Breeds. *Mamm. Genome* **1997**, *8*, 182–185. [[CrossRef](#)]
137. Marsden, C.D.; Vecchy, D.O.-D.; O'Brien, D.P.; Taylor, J.F.; Ramírez, O.; Vilà, C.; Marquès-Bonet, T.; Schnabel, R.D.; Wayne, R.K.; Lohmueller, K.E. Bottlenecks and Selective Sweeps during Domestication Have Increased Deleterious Genetic Variation in Dogs. *Proc. Natl. Acad. Sci. USA* **2015**, *113*, 152–157. [[CrossRef](#)]
138. Stephen, J.; Ledger, R.A. Relinquishing Dog Owners' Ability to Predict Behavioural Problems in Shelter Dogs Post Adoption. *Appl. Anim. Behav. Sci.* **2007**, *107*, 88–99. [[CrossRef](#)]
139. Plomin, R.; Asbury, K. Nature and Nurture: Genetic and Environmental Influences on Behavior. *ANNALS Am. Acad. Political Soc. Sci.* **2005**, *600*, 86–98. [[CrossRef](#)]
140. Akey, J.M.; Ruhe, A.L.; Akey, D.T.; Wong, A.K.; Connelly, C.F.; Madeoy, J.J.; Nicholas, T.J.; Neff, M.W. From the Cover: Tracking Footprints of Artificial Selection in the Dog Genome. *Proc. Natl. Acad. Sci. USA* **2010**, *107*, 1160–1165. [[CrossRef](#)] [[PubMed](#)]
141. Maglieri, V.; Prato-Previde, E.; Tommasi, E.; Palagi, E. Wolf-like or Dog-like? A Comparison of Gazing Behaviour across Three Dog Breeds Tested in Their Familiar Environments. *R. Soc. Open Sci.* **2019**, *6*, 190946. [[CrossRef](#)] [[PubMed](#)]
142. Salonen, M.; Sulkama, S.; Mikkola, S.; Puurunen, J.; Hakanen, E.; Tiira, K.; Araújo, C.; Lohi, H. Prevalence, Comorbidity, and Breed Differences in Canine Anxiety in 13,700 Finnish Pet Dogs. *Sci. Rep.* **2020**, *10*, 2962. [[CrossRef](#)]
143. Blackwell, E.J.; Bradshaw, J.W.S.; Casey, R.A. Fear Responses to Noises in Domestic Dogs: Prevalence, Risk Factors and Co-Occurrence with Other Fear Related Behaviour. *Appl. Anim. Behav. Sci.* **2013**, *145*, 15–25. [[CrossRef](#)]
144. Col, R.; Day, C.; Phillips, C.J.C. An Epidemiological Analysis of Dog Behavior Problems Presented to an Australian Behavior Clinic, with Associated Risk Factors. *J. Vet. Behav. Clin. Appl. Res.* **2016**, *15*, 1–11. [[CrossRef](#)]
145. Storengen, L.M.; Lingaas, F. Noise Sensitivity in 17 Dog Breeds: Prevalence, Breed Risk and Correlation with Fear in Other Situations. *Appl. Anim. Behav. Sci.* **2015**, *171*, 152–160. [[CrossRef](#)]
146. Bamberger, M.; Houpt, K.A. Signalment Factors, Comorbidity, and Trends in Behavior Diagnoses in Dogs: 1644 Cases (1991–2001). *J. Am. Vet. Med. Assoc.* **2006**, *229*, 1591–1601. [[CrossRef](#)] [[PubMed](#)]
147. Dinwoodie, I.R.; Dwyer, B.; Zottola, V.; Gleason, D.; Dodman, N.H. Demographics and Comorbidity of Behavior Problems in Dogs. *J. Vet. Behav.* **2019**, *32*, 62–71. [[CrossRef](#)]
148. Edwards, P.T.; Hazel, S.J.; Browne, M.; Serpell, J.A.; McArthur, M.L.; Smith, B.P. Investigating Risk Factors That Predict a Dog's Fear during Veterinary Consultations. *PLoS ONE* **2019**, *14*, e0215416. [[CrossRef](#)]
149. Serpell, J.A.; Duffy, D.L. Aspects of Juvenile and Adolescent Environment Predict Aggression and Fear in 12-Month-Old Guide Dogs. *Front. Vet. Sci.* **2016**, *3*, 49. [[CrossRef](#)] [[PubMed](#)]
150. Starling, M.J.; Branson, N.; Thomson, P.C.; McGreevy, P.D. "Boldness" in the Domestic Dog Differs among Breeds and Breed Groups. *Behav. Process.* **2013**, *97*, 53–62. [[CrossRef](#)] [[PubMed](#)]
151. Svartberg, K. Breed-Typical Behaviour in Dogs—Historical Remnants or Recent Constructs? *Appl. Anim. Behav. Sci.* **2006**, *96*, 293–313. [[CrossRef](#)]
152. Temesi, A.; Turcsán, B.; Miklósi, Á. Measuring Fear in Dogs by Questionnaires: An Exploratory Study toward a Standardized Inventory. *Appl. Anim. Behav. Sci.* **2014**, *161*, 121–130. [[CrossRef](#)]
153. McCobb, E.A.; Brown, E.L.G.; Damiani, K.; Dodman, N.H. Thunderstorm Phobia in Dogs: An Internet Survey of 69 Cases. *J. Am. Anim. Hosp. Assoc.* **2001**, *37*, 319–324. [[CrossRef](#)] [[PubMed](#)]
154. Wright, H.F.; Mills, D.S.; Pollux, P.M.J. Development and Validation of a Psychometric Tool for Assessing Impulsivity in the Domestic Dog (*Canis familiaris*). *Int. J. Comp. Psychol.* **2011**, *24*, 210–225. [[CrossRef](#)]
155. Arhant, C.; Bubna-Littitz, H.; Bartels, A.; Futschik, A.; Troxler, J. Behaviour of Smaller and Larger Dogs: Effects of Training Methods, Inconsistency of Owner Behaviour and Level of Engagement in Activities with the Dog. *Appl. Anim. Behav. Sci.* **2010**, *123*, 131–142. [[CrossRef](#)]
156. Arhant, C.; Wogritsch, R.; Troxler, J. Assessment of Behavior and Physical Condition of Shelter Cats as Animal-Based Indicators of Welfare. *J. Vet. Behav.* **2015**, *10*, 399–406. [[CrossRef](#)]



157. Hakanen, E.; Mikkola, S.; Salonen, M.; Puurunen, J.; Sulkama, S.; Araújo, C.; Lohi, H. Active and Social Life Is Associated with Lower Non-Social Fearfulness in Pet Dogs. *Sci. Rep.* **2020**, *10*, 13774. [CrossRef]
158. Khoshnegah, J.; Azizzadeh, M.; Gharaie, A.M. Risk Factors for the Development of Behavior Problems in a Population of Iranian Domestic Dogs: Results of a Pilot Survey. *Appl. Anim. Behav. Sci.* **2011**, *131*, 123–130. [CrossRef]
159. Ley, J.M.; Bennett, P.C.; Coleman, G.J. A Refinement and Validation of the Monash Canine Personality Questionnaire (MCPQ). *Appl. Anim. Behav. Sci.* **2009**, *116*, 220–227. [CrossRef]
160. McGreevy, P.D.; Georgevsky, D.; Carrasco, J.J.; Valenzuela, M.J.; Duffy, D.L.; Serpell, J.A. Dog Behavior Co-Varies with Height, Bodyweight and Skull Shape. *PLoS ONE* **2013**, *8*, e80529. [CrossRef]
161. Stone, H.R.; McGreevy, P.D.; Starling, M.J.; Forkman, B. Associations between Domestic-Dog Morphology and Behaviour Scores in the Dog Mentality Assessment. *PLoS ONE* **2016**, *11*, e0149403. [CrossRef]
162. Zapata, I.; Serpell, J.A.; Alvarez, C.E. Genetic Mapping of Canine Fear and Aggression. *BMC Genom.* **2016**, *17*, 572. [CrossRef] [PubMed]
163. Zapata, I.; Lilly, M.L.; Herron, M.E.; Serpell, J.A.; Alvarez, C.E. Genetic Testing of Dogs Predicts Problem Behaviors in Clinical and Nonclinical Samples. *BMC Genom.* **2020**, *23*, 102. [CrossRef] [PubMed]
164. Duffy, D.L.; Hsu, Y.; Serpell, J.A. Breed Differences in Canine Aggression. *Appl. Anim. Behav. Sci.* **2008**, *114*, 441–460. [CrossRef]
165. MacLean, E.L.; Snyder-Mackler, N.; Vonholdt, B.M.; Serpell, J.A. Highly Heritable and Functionally Relevant Breed Differences in Dog Behaviour. *Proc. R. Soc. B* **2019**, *286*, 20190716. [CrossRef]
166. Flint, H.E.; Coe, J.B.; Serpell, J.A.; Pearl, D.L.; Niel, L. Risk Factors Associated with Stranger-Directed Aggression in Domestic Dogs. *Appl. Anim. Behav. Sci.* **2017**, *197*, 45–54. [CrossRef]
167. Hsu, Y.; Sun, L. Factors Associated with Aggressive Responses in Pet Dogs. *Appl. Anim. Behav. Sci.* **2010**, *123*, 108–123. [CrossRef]
168. Takeuchi, Y.; Ogata, N.; Houpt, K.A.; Scarlett, J.M. Differences in Background and Outcome of Three Behavior Problems of Dogs. *Appl. Anim. Behav. Sci.* **2001**, *70*, 297–308. [CrossRef]
169. Chastant-Maillard, S.; Guillemot, C.; Feugier, A.; Mariani, C.; Grellet, A.; Mila, H. Reproductive Performance and Pre-Weaning Mortality: Preliminary Analysis of 27,221 Purebred Female Dogs and 204,537 Puppies in France. *Reprod. Domest. Anim. Zuchtthg.* **2017**, *52*, 158–162. [CrossRef] [PubMed]
170. ESDAW-EU The Stray Dogs in Europe. ESDAW-EU. 2024. Available online: <https://www.esdaw-eu.eu/the-stray-dogs-in-europe.html> (accessed on 10 January 2024).
171. ASPCA Helping People and Pets/Shelter Intake and Surrender. Pet Statistics. 2023. Available online: <https://www.aspc.org/helping-people-pets/shelter-intake-and-surrender/pet-statistics> (accessed on 10 January 2024).
172. American Pet Products Association (APPA). *APPA National Pet Owners Survey 2017–2018*; APPA: Greenwich, CT, USA, 2017.
173. Nakamura, M.; Dhand, N.K.; Starling, M.J.; McGreevy, P.D. Descriptive Texts in Dog Profiles Associated with Length of Stay Via an Online Rescue Network. *Animals* **2019**, *9*, 464. [CrossRef] [PubMed]
174. Gunter, L.M.; Barber, R.T.; Wynne, C.D.L. What’s in a Name? Effect of Breed Perceptions & Labeling on Attractiveness, Adoptions & Length of Stay for Pit-Bull-Type Dogs. *PLoS ONE* **2016**, *11*, e0146857.
175. Raudies, C.; Waiblinger, S.; Arhant, C. Characteristics and Welfare of Long-Term Shelter Dogs. *Animals* **2021**, *11*, 194. [CrossRef] [PubMed]
176. Taylor, K.D.; Mills, D.S. The Effect of the Kennel Environment on Canine Welfare: A Critical Review of Experimental Studies. *Anim. Welf.* **2007**, *16*, 435–447. [CrossRef]
177. Beerda, B.; Schilder, M.B.; van Hooff, J.A.; de Vries, H.W. Manifestations of Chronic and Acute Stress in Dogs. *Appl. Anim. Behav. Sci.* **1997**, *52*, 307–319. [CrossRef]
178. Beerda, B.; Schilder, M.B.; van Hooff, J.A.; de Vries, H.W.; Mol, J.A. Chronic Stress in Dogs Subjected to Social and Spatial Restriction. I. Behavioral Responses. *Physiol. Behav.* **1999**, *66*, 233–242. [CrossRef]
179. Owczarczak-Garstecka, S.C.; Burman, O.H.P. Can Sleep and Resting Behaviours Be Used as Indicators of Welfare in Shelter Dogs (*Canis lupus familiaris*)? *PLoS ONE* **2016**, *11*, e0163620. [CrossRef]
180. Stephen, J.; Ledger, R.A. An Audit of Behavioral Indicators of Poor Welfare in Kennelled Dogs in the United Kingdom. *J. Appl. Anim. Welf. Sci.* **2005**, *8*, 79–95. [CrossRef]
181. Weir, S.; Kessler, S.E. The Making of a (Dog) Movie Star: The Effect of the Portrayal of Dogs in Movies on Breed Registrations in the United States. *PLoS ONE* **2022**, *17*, e0261916. [CrossRef]
182. Darwin, C. *The Variation of Animals and Plants under Domestication*; Murray: London, UK, 1868.
183. Fay, J.C.; Wu, C.-I. Hitchhiking under Positive Darwinian Selection. *Genetics* **2000**, *155*, 1405–1413. [CrossRef]
184. Demko, J.L.; McLaughlin, R.M. Developmental Orthopedic Disease. *Vet. Clin. North America. Small Anim. Pract.* **2005**, *35*, 1111–1135. [CrossRef]
185. Lafond, E.; Breur, G.J.; Austin, C.C. Breed Susceptibility for Developmental Orthopedic Diseases in Dogs. *J. Am. Anim. Hosp. Assoc.* **2002**, *38*, 467–477. [CrossRef]
186. Hayes, G.M.; Friend, E.J.; Jeffery, N.D. Relationship between Pharyngeal Conformation and Otitis Media with Effusion in Cavalier King Charles Spaniels. *Vet. Rec.* **2010**, *167*, 55–58. [CrossRef] [PubMed]
187. Olsson, M.; Meadows, J.R.S.; Truvé, K.; Pielberg, G.R.; Puppo, F.; Mauceli, E.; Quilez, J.; Tomomura, N.; Zanna, G.; Docampo, M.J.; et al. A Novel Unstable Duplication Upstream of HAS2 Predisposes to a Breed-Defining Skin Phenotype and a Periodic Fever Syndrome in Chinese Shar-Pei Dogs. *PLoS Genet.* **2011**, *73*, e1001332. [CrossRef] [PubMed]

188. O'Neill, D.G.; Baral, L.S.; Church, D.B.; Brodbelt, D.C.; Packer, R.M.A. Demography and Disorders of the French Bulldog Population under Primary Veterinary Care in the UK in 2013. *Canine Genet. Epidemiol.* **2018**, *5*, 3. [CrossRef] [PubMed]
189. Packer, R.M.A.; O'Neill, D.G.; Fletcher, F.; Farnworth, M.J. Great Expectations, Inconvenient Truths, and the Paradoxes of the Dog-Owner Relationship for Owners of Brachycephalic Dogs. *PLoS ONE* **2019**, *14*, e0219918. [CrossRef] [PubMed]
190. Fitzpatrick, J.L.; Evans, J.P. Reduced Heterozygosity Impairs Sperm Quality in Endangered Mammals. *Biol. Lett.* **2009**, *5*, 320–323. [CrossRef] [PubMed]
191. Álvarez, G.; Quinteiro, C.; Ceballos, F.C. Inbreeding and Genetic Disorder. 2011. Available online: [https://cdn.intechopen.com/pdfs/23704/InTech-Inbreeding\\_and\\_genetic\\_disorder.pdf?ref=arnondora.in.th](https://cdn.intechopen.com/pdfs/23704/InTech-Inbreeding_and_genetic_disorder.pdf?ref=arnondora.in.th) (accessed on 20 December 2023).
192. Khlát, M.; Khoury, M. Inbreeding and Diseases: Demographic, Genetic, and Epidemiologic Perspectives. *Epidemiol. Rev.* **1991**, *13*, 28–41. [CrossRef]
193. Piper, M.D.W.; Partridge, L. *Drosophila* as a Model for Ageing. *Biochim. Biophys. Acta. Mol. Basis Dis.* **2017**, *1864*, 2707–2717. [CrossRef]
194. van Oosterhout, C.; Zijlstra, W.G.; Heuven, M.K.; van Brakefield, P.M. Inbreeding Depression and Genetic Load In Laboratory Metapopulations Of The Butterfly *Bicyclus Anynana*. *Int. J. Org. Evol.* **2000**, *54*, 218–225. [CrossRef]
195. Sewalem, A.; Sewalem, A.; Kistemaker, G.; Miglior, F.; Miglior, F.; Doormaal, B.V. Analysis of Inbreeding and Its Relationship with Functional Longevity in Canadian Dairy Cattle. *J. Dairy Sci.* **2006**, *89*, 2210–2216. [CrossRef] [PubMed]
196. Mata, F.; Mata, A. Investigating the Relationship between Inbreeding and Life Expectancy in Dogs: Mongrels Live Longer than Pure Breeds. *PeerJ* **2023**, *11*, e15718. [CrossRef]
197. Yordy, J.; Kraus, C.; Hayward, J.J.; White, M.E.; Shannon, L.M.; Creevy, K.E.; Promislow, D.E.L.; Boyko, A.R. Body Size, Inbreeding, and Lifespan in Domestic Dogs. *Conserv. Genet.* **2019**, *21*, 137–148. [CrossRef] [PubMed]
198. Merriam-Webster Definition of PUPPY MILL. Available online: <https://www.merriam-webster.com/dictionary/puppy%20mill> (accessed on 8 December 2023).
199. HSVMA Humane Society Veterinary Medical Association (HSVMA) Veterinary Report on Puppy Mills. 2013. Available online: [https://www.hsvma.org/assets/pdfs/hsvma\\_veterinary\\_report\\_puppy\\_mills.pdf](https://www.hsvma.org/assets/pdfs/hsvma_veterinary_report_puppy_mills.pdf) (accessed on 8 December 2023).
200. Hinds, M.D. Amish at Heart of “Puppy Mill” Debate. 1993. Available online: <https://www.nytimes.com/1993/09/20/us/amish-at-heart-of-puppy-mill-debate.html> (accessed on 8 December 2023).
201. PETA Puppy Mills. PETA. 2010. Available online: <https://www.peta.org/issues/animal-companion-issues/pet-trade/puppy-mills/> (accessed on 8 December 2023).
202. NHES National Humane Education Society. Puppy Mills. 2015. Available online: <https://www.nhes.org/puppy-mills/> (accessed on 8 December 2023).
203. Bradley, C. *Saving Gracie*; Wiley: York County, PA, USA, 2010.
204. Fischer, L. *Dog Blessed: Puppy Mill Survivor Stories*; Happy Tails Books: Boulder, CO, USA, 2010.
205. Prescott, M.J.; Morton, D.B.; Anderson, D.W.; Buckwell, A.C.; Heath, S.E.; Hubrecht, R.C.; Jennings, M.; Robb, D.; Ruane, B.; Swallow, J.; et al. Refining Dog Husbandry and Care. *Lab. Anim.* **2004**, *38*, 1–96. [CrossRef]
206. Gunter, L.M.; Gilchrist, R.J.; Blade, E.M.; Barber, R.T.; Feuerbacher, E.N.; Platzer, J.M.; Wynne, C.D.L. Investigating the Impact of Brief Outings on the Welfare of Dogs Living in US Shelters. *Animals* **2021**, *11*, 548. [CrossRef]
207. Menor-Campos, D.J.; Molleda-Carbonell, J.M.; López-Rodríguez, R. Effects of Exercise and Human Contact on Animal Welfare in a Dog Shelter. *Vet. Rec.* **2011**, *169*, 388. [CrossRef] [PubMed]
208. Takáčová, D.; Skurková, L.; Mesarčová, L.; Lešková, L.; Kottferová, L.; Packová, A.; Vajányi, D.; Kottferová, J. Dog Tethering in Slovakia: Legal, Ethical and Behavioral Aspects and Dog Welfare Implications. *Animals* **2021**, *11*, 594. [CrossRef]
209. Dupont, S.; Butaye, P.; Claerebout, E.; Theuns, S.; Duchateau, L.; de Maele, I.V.; Daminet, S. Enteropathogens in Pups from Pet Shops and Breeding Facilities. *J. Small Anim. Pract.* **2013**, *54*, 475–480. [CrossRef]
210. Morgan, K.N.; Tromborg, C.T. Sources of Stress in Captivity. *Appl. Anim. Behav. Sci.* **2007**, *102*, 262–302. [CrossRef]
211. Sonntag, Q.; Overall, K.L. Key Determinants of Dog and Cat Welfare: Behaviour, Breeding and Household Lifestyle. *Rev. Sci. Et Tech.* **2014**, *33*, 213–220. [CrossRef]
212. Lockwood, R. The Ethology and Epidemiology of Canine Aggression. In *The Domestic Dog: Its Evolution, Behavior, and Interactions with People*; Cambridge University Press: Cambridge, UK, 2016; pp. 160–181.
213. Nogueira, L.B.; Palme, R.; Mendonça-Furtado, O. Give Them a Toy or Increase Time out of Kennel at Lawn Areas: What Is the Influence of These Interventions on Police Dogs’ Welfare? *Animals* **2021**, *11*, 2264. [CrossRef]
214. Mcmillan, F.D.; Duffy, D.L.; Serpell, J.A. Mental Health of Dogs Formerly Used as “breeding Stock” in Commercial Breeding Establishments. *Appl. Anim. Behav. Sci.* **2011**, *135*, 86–94. [CrossRef]
215. Polgár, Z.; Blackwell, E.J.; Rooney, N.J. Assessing the Welfare of Kennelled Dogs—A Review of Animal-Based Measures. *Appl. Anim. Behav. Sci.* **2019**, *213*, 1–13. [CrossRef] [PubMed]
216. Serpell, J.; Duffy, D.L.; Jagoe, J.A. Becoming a Dog: Early Experience and the Development of Behavior. In *The Domestic Dog*; Serpell, J., Ed.; Cambridge University Press: Cambridge, UK, 2016; pp. 93–117. ISBN 978-1-107-02414-4.
217. Puurunen, J.; Hakanen, E.; Salonen, M.; Mikkola, S.; Sulkama, S.; Araújo, C.; Lohi, H. Inadequate Socialisation, Inactivity, and Urban Living Environment Are Associated with Social Fearfulness in Pet Dogs. *Sci. Rep.* **2020**, *10*, 3527. [CrossRef] [PubMed]
218. Walsh, E.A. Assessing the Impact of COVID-19 Restrictions on the Welfare and on the Behavior of Puppies and Dogs in Ireland. *J. Appl. Anim. Ethics Res.* **2023**, *5*, 51–81. [CrossRef]



219. Mairesse, J.; Lesage, J.; Breton, C.; Bréant, B.; Hahn, T.; Darnaudéry, M.; Dickson, S.L.; Seckl, J.R.; Blondeau, B.; Vieau, D.; et al. Maternal Stress Alters Endocrine Function of the Feto-Placental Unit in Rats. *Am. J. Physiology. Endocrinol. Metab.* **2007**, *292*, E1526–E1533. [CrossRef] [PubMed]
220. Grace, J.K.; Parenteau, C.; Angelier, F. Post-Natal Corticosterone Exposure Downregulates the HPA Axis through Adulthood in a Common Passerine. *Gen. Comp. Endocrinol.* **2020**, *292*, 113421. [CrossRef]
221. McKenna, B.G.; Hammen, C.L.; Brennan, P.A. HPA-Axis Multilocus Genetic Profile Score Moderates the Association between Maternal Prenatal Perceived Stress and Offspring Depression in Early Adulthood. *Dev. Psychopathol.* **2020**, *33*, 122–134. [CrossRef] [PubMed]
222. Walker, D.J.; Zimmer, C.; Larriva, M.; Healy, S.D.; Spencer, K.A. Early-Life Adversity Programs Long-Term Cytokine and Microglia Expression within the HPA Axis in Female Japanese Quail. *J. Exp. Biol.* **2019**, *222*, jeb187039. [CrossRef]
223. Oluwagbenga, E.; Tetel, V.; Schober, J.; Fraley, G.S. Chronic Heat Stress Part 2: Increased Stress and Fear Responses in F1 Pekin Ducks Raised from Parents That Experienced Heat Stress. *Animals* **2023**, *13*, 1748. [CrossRef]
224. Enayati, M.; Mosafari, B.; Homberg, J.R.; Diniz, D.M.; Salari, A.A. Prenatal Maternal Stress Alters Depression-Related Symptoms in a Strain—And Sex-Dependent Manner in Rodent Offspring. *Life Sci.* **2020**, *251*, 117597. [CrossRef] [PubMed]
225. Tatemoto, P.; Bernardino, T.; Morrone, B.; Queiroz, M.R.; Zanella, A.J. Stereotypic Behavior in Sows Is Related to Emotionality Changes in the Offspring. *Front. Vet. Sci.* **2020**, *7*, 79. [CrossRef]
226. Schneider, M.L.; Moore, C.F.; Roberts, A.D.; DeJesus, O.T. Prenatal Stress Alters Early Neurobehavior, Stress Reactivity and Learning in Non-Human Primates: A Brief Review. *Stress* **2001**, *4*, 183–193. [CrossRef] [PubMed]
227. Reyes-Contreras, M.; Taborsky, B. Stress Axis Programming Generates Long-Term Effects on Cognitive Abilities in a Cooperative Breeder. *Proc. R. Soc. B Biol. Sci.* **2022**, *289*, 20220117. [CrossRef]
228. Schülke, O.; Ostner, J.; Berghänel, A. Prenatal Maternal Stress Effects on the Development of Primate Social Behavior. *Behav. Ecol. Sociobiol.* **2019**, *73*, 128. [CrossRef]
229. Cannizzaro, C.; Plescia, F.; Martire, M.; Gagliano, M.; Cannizzaro, G.; Mantia, G.; Cannizzaro, E. Single, Intense Prenatal Stress Decreases Emotionality and Enhances Learning Performance in the Adolescent Rat Offspring: Interaction with a Brief, Daily Maternal Separation. *Behav. Brain Res.* **2006**, *169*, 128–136. [CrossRef] [PubMed]
230. Marco, E.M.; Scattoni, M.L.; Rapino, C.; Ceci, C.; Chaves, N.; Macri, S.; Maccarrone, M.; Laviola, G. Emotional, Endocrine and Brain Anandamide Response to Social Challenge in Infant Male Rats. *Psychoneuroendocrinology* **2013**, *38*, 2152–2162. [CrossRef] [PubMed]
231. Kan, J.M.; Callaghan, B.L.; Richardson, R. A Mother’s Past Can Predict Her Offspring’s Future: Previous Maternal Separation Leads to the Early Emergence of Adult-like Fear Behavior in Subsequent Male Infant Rat Offspring. *Behav. Neurosci.* **2016**, *130*, 511–520. [CrossRef]
232. Mastorci, F.; Vicentini, M.; Viltart, O.; Manghi, M.; Graiani, G.; Quaini, F.; Meerlo, P.; Nalivaiko, E.; Maccari, S.; Sgoifo, A. Long-Term Effects of Prenatal Stress: Changes in Adult Cardiovascular Regulation and Sensitivity to Stress. *Neurosci. Biobehav. Rev.* **2009**, *33*, 191–203. [CrossRef]
233. Lee, P.R.; Brady, D.L.; Shapiro, R.A.; Dorsa, D.M.; Koenig, J.I. Prenatal Stress Generates Deficits in Rat Social Behavior: Reversal by Oxytocin. *Brain Res.* **2007**, *1156*, 152–167. [CrossRef]
234. McEvoy, V.; Espinosa, U.B.; Crump, A.; Arnott, G. Canine Socialisation: A Narrative Systematic Review. *Animals* **2022**, *12*, 2895. [CrossRef] [PubMed]
235. Okamoto, K.; Inoue, K.; Kawai, J.; Yamauchi, H.; Hisamoto, S.; Nishisue, K.; Koyama, S.; Satoh, T.; Tsushima, M.; Irimajiri, M. Factors Influencing the Development of Canine Fear of Thunder. *Appl. Anim. Behav. Sci.* **2023**, *270*, 106139. [CrossRef]
236. Sacchettino, L.; Gatta, C.L.; Chirico, A.; Avallone, L.; Napolitano, F.; d’Angelo, D. Puppies Raised during the COVID-19 Lockdown Showed Fearful and Aggressive Behaviors in Adulthood: An Italian Survey. *Vet. Sci.* **2023**, *10*, 198. [CrossRef] [PubMed]
237. Dogs Trust. The Puppy Smuggling Scandal: An Investigation into the Illegal Entry of Dogs into Great Britain under the Pets Travel Scheme. 2014. Available online: <https://www.dogstrust.org.uk/downloads/2014%20Puppy%20smuggling%20report.pdf> (accessed on 20 December 2023).
238. IBF International Consulting; VetEfficT; Wageningen University & Research Centre (WUR); Istituto Zooprofilattico Sperimentale dell’Abruzzo e del Molise “G. Caporale” (IZSAM). *Study on the Welfare of Dogs and Cats Involved in Commercial Practices*; European Commission: Brussels, Belgium, 2015.
239. IFAW. How Much Is That Doggie on My Browser: The Truth Behind Online Puppy Sales. 2012. Available online: <https://s3.amazonaws.com/ifaw-pantheon/sites/default/files/legacy/ifaw-report-how-much-is-that-doggie-on-my-browser.pdf> (accessed on 20 December 2023).
240. Maher, J.; Wyatt, T. Rural-Urban Dynamics in the UK Illegal Puppy Trade: Trafficking and Trade in “Man’s Best Friend”. *Int. J. Rural. Law Policy* **2019**, *2*, 1–20. [CrossRef]
241. Wyatt, T.; Jennifer, M.W.; Paul, B. Scoping Research on the Sourcing of Pet Dogs from Illegal Importation and Puppy Farms 2016–2017. 2017. Available online: <https://nrl.northumbria.ac.uk/id/eprint/33184/1/Final%20Report%20Nov%202017.pdf> (accessed on 20 December 2023).
242. European Commission Illegal Trade of Cats & Dogs EU Enforcement Action. 2023. Available online: [https://food.ec.europa.eu/system/files/2023-12/agri-fraud\\_report\\_Illegal-trade\\_cats-dogs.pdf](https://food.ec.europa.eu/system/files/2023-12/agri-fraud_report_Illegal-trade_cats-dogs.pdf) (accessed on 10 January 2024).

243. European Commission. Proposal for a Regulation of the European Parliament and of the Council on the Welfare of Dogs and Cats and Their Traceability. 2023. Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0443> (accessed on 10 January 2024).
244. Bennett, P.C.; Perini, E. Tail Docking in Dogs: Can Attitude Change Be Achieved? *Aust. Vet. J.* **2003**, *81*, 277–282. [CrossRef] [PubMed]
245. Mellor, D.J. Tail Docking of Canine Puppies: Reassessment of the Tail’s Role in Communication, the Acute Pain Caused by Docking and Interpretation of Behavioural Responses. *Animals* **2018**, *8*, 82. [CrossRef] [PubMed]
246. Gross, T.L.; Carr, S.H. Amputation Neuroma of Docked Tails in Dogs. *Vet. Pathol.* **1990**, *27*, 61–62. [CrossRef]
247. Council of Europe. European Convention for the Protection of Pet Animals (ETS No. 125). Treaty Office 1987. Available online: <https://rm.coe.int/168007a67d> (accessed on 20 December 2023).
248. UK Government. Animal Welfare Act 2006. 2006. Available online: <https://www.legislation.gov.uk/ukpga/2006/45/contents> (accessed on 20 December 2023).
249. Club, A.K. AKC Statement on AVMA Crop and Dock Policy. American Kennel Club 2008. Available online: <https://www.akc.org/press-releases/akc-statement-on-avma-crop-and-dock-policy/> (accessed on 20 December 2023).
250. Hasegawa, M.; Ohtani, N.; Ohta, M. Dogs’ Body Language Relevant to Learning Achievement. *Animals* **2014**, *4*, 45–58. [CrossRef]
251. Noonan, G.J.; Rand, J.; Blackshaw, J.K.; Priest, J. Behavioural Observations of Puppies Undergoing Tail Docking. *Appl. Anim. Behav. Sci.* **1996**, *49*, 335–342. [CrossRef]
252. Bloom, T.; Trevathan-Minnis, M.; Atlas, N.; MacDonald, D.A.; Friedman, H.L. Identifying Facial Expressions in Dogs: A Replication and Extension Study. *Behav. Process.* **2021**, *186*, 104371. [CrossRef] [PubMed]
253. Buckland, E.L.; Volk, H.A.; Burn, C.C.; Abeyesinghe, S.M. Owner Perceptions of Companion Dog Expressions of Positive Emotional States and the Contexts in Which They Occur. *Anim. Welf.* **2014**, *23*, 287–296. [CrossRef]
254. Podberscek, A.L.; Paul, E.S.; Serpell, J.A. *Companion Animals and Us: Exploring the Relationships between People and Pets*; Podberscek, A.L., Ed.; Cambridge University Press: Cambridge, UK, 2001; ISBN 978-0-521-63113-6.
255. Shields, G. *The American Book of the Dog*; Rand McNally: Chicago, IL, USA, 1891.
256. Mills, K.E.; Robbins, J.; Keyserlingk, M.A.G. von Tail Docking and Ear Cropping Dogs: Public Awareness and Perceptions. *PLoS ONE* **2016**, *11*, e0158131. [CrossRef]
257. Crook, A. Cosmetic Surgery in North America and Latin America. World Small Animal Veterinary Association World Congress—Vancouver 2001. Available online: <https://www.vin.com/apputil/content/defaultadv1.aspx?pId=8708&id=3843659> (accessed on 20 December 2023).
258. American Veterinary Medical Association. Canine Devocalization 2023. Available online: <https://www.avma.org/sites/default/files/2023-08/avma-lit-review-canine-devocalization-0323.pdf> (accessed on 20 December 2023).
259. Humane Society Veterinary Med Assoc. Humane Society Veterinary Medical Association Devocalization Fact Sheet. 2009. Available online: <https://www.hsvma.org/assets/pdfs/devocalization-facts.pdf> (accessed on 20 December 2023).
260. Arford, K. Why Do Dogs Bark At Each Other? American Kennel Club. 2020. Available online: <https://www.akc.org/expert-advice/advice/why-do-dogs-bark-at-each-other/> (accessed on 27 November 2023).
261. Council of Europe Resolution on Surgical Operations in Pet Animals. 1995. Available online: <https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=090000168008c37b> (accessed on 20 January 2024).
262. Romkes, G.; Eule, J.C. Followup of a Dog with an Intraocular Silicone Prosthesis Combined with an Extraocular Glass Prosthesis. *Case Rep. Vet. Med.* **2012**, *2012*, 762452. [CrossRef]
263. Hao, T.; Chen, P. Comparative Experimental Re-Evaluation of the Two Implanting Methods of Silicone Gel Testicular Prostheses in Beagle Dogs. *BMC Res. Notes* **2011**, *4*, 99. [CrossRef]
264. Dafalla, D.S.E.; Ahemad, D.S.R.; El-Amin, D.E.I.S. Toxicity Effects of Hair Dye Application on Respiratory System In Experimental Animals. *Indo Am. J. Pharm. Sci.* **2019**, *6*, 11682–11687.
265. Chaudhari, V.A.; Kumaran, M.; Mittal, C.; Srinivas, B.H.; Shaha, K.K. Hair Dye Poisoning and the Toxic Effects of Paraphenylenediamine. *J. Indian Soc. Toxicol.* **2017**, *13*, 37–40.
266. Devi, M. Toxicological Effects of Hair Dye Paraphenylenediamine: A Threat to the Cosmetic World. *Int. J. Res. Anal. Rev.* **2016**, *3*, 19–23.
267. Tampa, M.; Mitran, M.I.; Mitran, C.I.; Matei, C.; Amuzescu, A.; Buzatu, A.A.; Georgescu, S.R. Viral Infections Confined to Tattoos—A Narrative Review. *Medicina* **2022**, *58*, 342. [CrossRef]
268. Schubert, S.; Kluger, N.; Schreiber, I. Hypersensitivity to Permanent Tattoos: Literature Summary and Comprehensive Review of Patch Tested Tattoo Patients 1997–2022. *Contact Dermat.* **2023**, *88*, 331–350. [CrossRef]

**Disclaimer/Publisher’s Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.