

Although Purebred Dogs Can Be Best in Show, Are They Worst in Health?

Why diseases plague purebred dogs and
how breeders, owners and genetics can
help

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The Cavalier King Charles spaniel, treasured for its tender disposition, is prone to genetic diseases and numerous other inherited health ailments.
Credit: Crystal Rolfe/Flickr

With its sweet and loving disposition, combined with

silky fur and elegantly droopy ears, the Cavalier King Charles spaniel is a popular breed—with families paying hundreds, sometimes thousands, of dollars per puppy. Unfortunately, though, it is almost certain that their pet will also come with genetic disorders.

By age five, for example, half of all Cavaliers will develop mitral valve disease, a serious heart condition that leaves the dogs susceptible to premature death.

By the same age, up to 70 percent will suffer from canine syringomyelia, a debilitating neurological disorder in which the brain is too large for the skull, causing severe pain in the neck and shoulders, along with damage to parts of the dog's spinal cord. And although Cavaliers may be a particularly obvious case of purebreds with problems, they aren't alone. Most purebred dogs today are at a high risk for numerous inherited diseases. Why did this happen—and what can be done about it?

Consequences of breeding

For almost 4,000 years people have been breeding dogs for certain traits—whether it be a physique ideal for hunting pests like badgers or a temperament suitable for companionship. But the vast number of modern breeds—and the roots of their genetically caused problems—came about over the past two centuries, as dog shows became popular and people began selectively inbreeding the animals to have specific physical features. Over time the American Kennel Club (AKC) and other such organizations have set standards defining what each variety should look like. To foster the desired appearance, breeders often

turn to line breeding—a type of inbreeding that mates direct relatives, such as grandmother and grandson. When a male dog wins numerous championships, for instance, he is often bred widely—a practice known as popular sire syndrome (pdf)—and his genes, healthy or not, then are spread like wildfire throughout the breed. As a result, purebred dogs not only have increased incidences of inherited diseases but also heightened health issues due to their bodily frames and shapes, such as hip dysplasia in large breeds like the German shepherd and the Saint Bernard, and patellar luxation, or persistent dislocation of the kneecap, in toy and miniature breeds.

How did we get to this situation? “Historically, a breeder’s primary concern was to produce dogs that look like the breed standard,” explains James Serpell, professor of ethics and animal welfare and director of the Center for the Interaction of Animals and Society at the University of Pennsylvania School of Veterinary Medicine. “Even if they did recognize health problems, breeders were too driven to produce what was perceived to be the most perfect breed.”

In the 1850s, for example, the bulldog looked more like today’s pit bull terrier—sturdy, energetic and athletic with a more elongated muzzle. But by the early 20th century, when dog shows became popular, the bulldog had acquired squat, bandy legs and a large head with a flattened muzzle. This altered figure makes it nearly impossible for them to reproduce without assistance, and the facial changes cause severe breathing problems in a third of all bulldogs.

Breeders frequently turn to artificial insemination because the female bulldog's bone structure cannot support the male's weight during mating. Most cannot give birth naturally either, because the puppies' heads are too big for the birth canal.

Large head size and short legs are part of the written standard, so Serpell believes these standards would have forced the bulldog into extinction if breeders did not rely on artificial insemination. "By essentially requiring judges to select animals that are the written standard, the club, in a way, signed the bulldog's death warrant," Serpell says.

Despite the negative effects of controlled breeding, animal science experts point to the value of selecting for consistency. "A breed standard is the template providing information about the appearance and temperament and reflects the original function and purpose of the breed," says Milan Hess, a Colorado-based veterinarian who works with the AKC. When choosing a dog as a pet, consumers look to the breed standard for certainty. "They know what it will look like and how it will act," says Thomas Famula, an animal-breeding specialist at the University of California, Davis.

Healthy choices

With the search for consistency yielding unforeseen flaws, however, who is to blame? Although the AKC sets the breed standards, it is principally a registry organization and has little control over the actual breeding process. Famula believes dog breeders hold the highest responsibility because they make the

decisions about which dogs to mate. “In the end, breeders are the ones creating the next generation of dogs,” Famula explains. But researchers like Famula and Jerold Bell, a geneticist at the Tufts University Cummings School of Veterinary Medicine, note that breeding practices are greatly influenced by the puppy buyers who Bell believes are largely ignorant about genetic issues. “The public is completely unaware. They see a cute dog and are sold,” Bell says. When purchasing a puppy, buyers can ask for medical tests and family history of diseases; but this rarely happens. “Although it’s ultimately the breeders’ responsibility, if there’s no pressure from the buyer, the system won’t change,” he adds, emphasizing that most of the top 10 diseases plaguing all dogs are controlled by single genes which, when identified, are easy to eliminate in the next generation.

Meanwhile many organizations breeding dogs for police work or to aid the disabled routinely do use data registries to maintain health information and make smart pairing decisions that reduce the prevalence of inherited ailments. The Seeing Eye, a guide dog school in Morristown, N.J., for example, uses genetic testing and keeps a database that tracks all dogs’ potential problems. “We have a geneticist on staff who evaluates each dog as a potential breeder, and we occasionally bring in dogs from other guide schools to ensure our gene pool doesn’t get too restricted,” says Michelle Barlak, senior public relations associate at The Seeing Eye.

Moving forward

It is possible to improve a breed and maintain its characteristics, of course. Consider the dalmatian. The challenge: the genes responsible for the breed's sought-after characteristic spotting pattern also result in high levels of uric acid in the breed's urine, predisposing them to the formation of urate crystals that frequently cause urinary blockages. Selecting against uric acid, however, would result in a spotless dalmatian. Now there's new hope from work that began in 1973, when Robert Schaible, a geneticist at the Indiana University School of Medicine, started the Dalmatian–English Pointer Backcross Project. He paired an AKC champion dalmatian with an English pointer, a breed with normal uric acid levels and a disposition similar to that of the dalmatian, and then crossed a dog from that litter to another dalmatian and so on. In 2011, after 15 generations, the AKC allowed dalmatians from this healthier pedigree, spots intact, to register.

Looking ahead at the future of purebreds, Serpell emphasizes that the goal is not to get rid of them but rather to put the health of the animals first. “I don't think anyone wants the breeds to disappear,” Serpell says. “I don't want the bulldog to disappear, I just want the bulldog to be transformed back into an animal that can function properly and is reasonably healthy.”

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