Improving the health of the brachycephalic breeds – information from Germany, the Netherlands and the UK

June 2016

Germany


- Passing a walking test (1000 meters) is mandatory for the breeding dogs in Pugs and Bulldogs (since 2009) as well as French Bulldogs in the VDH (German Kennel Club)
- French Bulldogs and English bulldogs time limit 8 minutes, Pugs 12 minutes.
- Only very few dogs do not pass.

The Netherlands

https://www.houdenvanhonden.nl/contentassets/27de95b0774b4730990cfae5b7c4c3e4/convenant_bulldog-breeding_rules.pdf

Requirements for English Bulldogs used for breeding as from June 1, 2014:

1. Breeding Suitability Test: fitness test, patellar luxation (physical exam), physical appearance.
   Fitness test: 1000 meter walk in 12 minutes. Recovery time 15 minutes (heart rate and temperature).
   2. ECVO eye test
   3. DNA test-HUU
   4. Restrictions for inbreeding
   5. Natural birth, caesarean section

At the moment only about 5% of the dogs do not pass the fitness test. It can be seen that dogs participating in the test have a longer nose and are better breathers compared to the dogs participating in the earlier years.

Austria

- Mandatory health tests:
  o English Bulldog: HD, Patella, Windpipe (trachea) inspection, Eyes
  o Pug: Patella, teeth
  o Pekingese: Heart, patella, PRA
  o French Bulldog: Patella
• Recommended:
  o English Bulldog: exercise tolerance test (ETT), skin problems, motion abnormalities, labor difficulties
  o Pug: ETT, dermatitis
  o Pekingese: ETT, dermatitis, teeth, ECVO (Eyes)
  o French Bulldog: ETT, dermatitis, teeth, ECVO
  o ETT mentioned also in Bullmastiff, Dogue de Bordeaux, Norwich/Norfolk, Chow chow, Boston Terrier

(See the appendix)

UK

A veterinary assessment for English Bulldogs. As of April 2014, this assessment has a pass or fail - but KC registration of Bulldog pups is not dependent on it.

BOAS meeting was held at the Kennel Club 15.6.2016. In the UK, there are three active research groups working on the BOAS problems in brachycephalic breeds. Researchers were presenting their work at the meeting:

Vet Compass, Dan O'Neill:

VetCompass pulls data from 450 UK vet practices in the search of some epidemiological/demographic trends and facts. Two relevant Vet Compass research papers:

1. Research on upper respiratory tract (URT) disorders, comparing Pugs, French Bulldogs and English Bulldogs to three non-brachycephalic breeds - Border Terrier, West Highland White Terrier and Yorkshire Terrier. Overall across the 6 breeds, 15.8% of dogs had at least one URT. Pugs, French Bulldogs and English Bulldogs had 22% and the reference breeds 9.7%.

2. The most common disorders in Pugs. O'Neill made the point that there may be some issues regarding "normal for the breed" and also how vets categorize respiratory problems. He suggested that BOAS (seen at 5.6%) probably referred to severe disease to have been categorized as such.

Obesity and corneal ulcers are a large problem in Pugs, but respiratory problems up there at a combined rate of around 15% (this is a prevalence study and was only looking at Pugs who were diagnosed or treated in 2013).

O’Neill looked at "ways forward":

1) improve the lives of the current population (eg. educate better about obesity/corneal ulcers)

2) improve the lives of future generations

3) reduce the number of brachycephalic dogs via education and/or tackling their representation in advertising & media.
English Bulldogs, French Bulldogs and Pugs all have different (albeit sometimes overlapping) breathing issues and vets need to learn to distinguish between them.

Only 10% of brachycephalics are Grade 0 (normal). There are at least some good breathers in all three breeds. 70% of Pugs and 50% of French Bulldogs have BOAS. Slightly fewer English Bulldogs.

Obesity in Pugs is a big risk factor. Judges are currently actively selecting for dogs that are too fat.

Stenotic nostrils increase the risk of BOAS: 17-fold in French Bulldogs.

English Bulldogs have the best nostrils.

Royal Veterinary College + Bristol University research, Rowena Packer:

The shorter the muzzle, the narrower the nares and the thicker the neck, the bigger the BOAS problem.

There are breed differences (eg. the Affenpinscher has a low risk for BOAS) but still very compelling evidence that dogs with a craniofacial index (CFR) of less than 0.2 are at extremely high risk of BOAS. The average Pug CFR is 0.08 and the Pekingese and the Japanese Chin even lower.

While there is some conformation variability within some breeds which would allow selection away from high-risk BOAS conformation, there isn't much variation in others, for example in Pugs or Pekingese. Almost every Japanese Chin they looked at, for instance, was having BOAS.

The most important conformational risk indicator is relative length of the muzzle.

Aimee Llewellyn, The Kennel Club:

There is a need for vets to be more active in reporting cesarean sections. Currently only 3% of reports come from vets, and the owners report the rest themselves.

Upcoming in the KC: breed conservational plans (not yet formally announced).

Profligate use of brachycephalic dogs in advertising is a problem and leads to "normalisation" of dogs that are not the best representatives of their breed.

Recent research papers

http://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0137496

Impact of Facial Conformation on Canine Health: Brachycephalic Obstructive Airway Syndrome

Rowena M. A. Packer, Anke Hendricks, Michael S. Tivers, Charlotte C. Burn

Published: October 28, 2015http://dx.doi.org/10.1371/journal.pone.0137496
Abstract

The domestic dog may be the most morphologically diverse terrestrial mammalian species known to man; pedigree dogs are artificially selected for extreme aesthetics dictated by formal Breed Standards, and breed-related disorders linked to conformation are ubiquitous and diverse. Brachycephaly—foreshortening of the facial skeleton—is a discrete mutation that has been selected for in many popular dog breeds e.g. the Bulldog, Pug, and French Bulldog. A chronic, debilitating respiratory syndrome, whereby soft tissue blocks the airways, predominantly affects dogs with this conformation, and thus is labelled Brachycephalic Obstructive Airway Syndrome (BOAS). Despite the name of the syndrome, scientific evidence quantitatively linking brachycephaly with BOAS is lacking, but it could aid efforts to select for healthier conformations. Here we show, in (1) an exploratory study of 700 dogs of diverse breeds and conformations, and (2) a confirmatory study of 154 brachycephalic dogs, that BOAS risk increases sharply in a non-linear manner as relative muzzle length shortens. BOAS only occurred in dogs whose muzzles comprised less than half their cranial lengths. Thicker neck girths also increased BOAS risk in both populations: a risk factor for human sleep apnoea and not previously realised in dogs; and obesity was found to further increase BOAS risk. This study provides evidence that breeding for brachycephaly leads to an increased risk of BOAS in dogs, with risk increasing as the morphology becomes more exaggerated. As such, dog breeders and buyers should be aware of this risk when selecting dogs, and breeding organisations should actively discourage exaggeration of this high-risk conformation in breed standards and the show ring.

Impact of Facial Conformation on Canine Health: Corneal Ulceration

Rowena M. A. Packer, Anke Hendricks, Charlotte C. Burn

Published: May 13, 2015http://dx.doi.org/10.1371/journal.pone.0123827

Abstract

Concern has arisen in recent years that selection for extreme facial morphology in the domestic dog may be leading to an increased frequency of eye disorders. Corneal ulcers are a common and painful eye problem in domestic dogs that can lead to scarring and/or perforation of the cornea, potentially causing blindness. Exaggerated juvenile-like craniofacial conformations and wide eyes have been suspected as risk factors for corneal ulceration. This study aimed to quantify the relationship between corneal ulceration risk and conformational factors including relative eyelid aperture width, brachycephalic (short-muzzled) skull shape, the presence of a nasal fold (wrinkle), and exposed eye-white. A 14 month cross-sectional study of dogs entering a large UK based small animal referral hospital for both corneal ulcers and unrelated disorders was carried out. Dogs were classed as affected if they were diagnosed with a corneal ulcer using fluorescein dye while at the hospital (whether referred for this disorder or not), or if a previous diagnosis of corneal ulcer(s) was documented in the dogs’ histories. Of 700 dogs recruited, measured and clinically examined, 31 were affected by corneal ulcers. Most cases were male (71%), small breed dogs (mean± SE weight: 11.4±1.1 kg), with the most commonly diagnosed breed being the Pug. Dogs with nasal folds were nearly five times more likely to be affected by corneal ulcers than those without, and brachycephalic dogs (craniofacial ratio <0.5) were twenty times more likely to be affected than non-brachycephalic dogs. A 10% increase in relative eyelid aperture width more than tripled the ulcer risk. Exposed eye-white was
associated with a nearly three times increased risk. The results demonstrate that artificially selecting for these facial characteristics greatly heightens the risk of corneal ulcers, and such selection should thus be discouraged to improve canine welfare.