

Sloping topline. Is it detrimental?

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Breed conformation has never before been scrutinised with such intensity as in the light of recent events and while this may at first appear to be an intrusion in to the hallowed ground of breed standards, the welfare of the dog must be paramount. Selective breeding for the different traits that make up individual breeds has also allowed less desirable traits to inadvertently occur. In the orthopaedic world the big three problems are hip dysplasia, elbow dysplasia and cruciate ligament rupture or disease, and undoubtedly these are basically conformational problems although defining the exact causes is difficult.

A more recent conundrum is the significance of the sloping topline in the German shepherd breed with regards to gait and lameness and before any discussion, it is well to remember the lines of the philosopher Hippocrates in 360 BC when he said "There are in fact two things:- science and opinion. The former begets knowledge, the latter ignorance." Evidence-based science is, where possible, on what judgements should be made.

A sloping topline is a term that needs defining to prevent any misunderstanding and in this context it is a sloping back line from the shoulders or withers down to the pin bones of the pelvis. This is evident with the dog at the walk or in the natural stance.

Dogs with low croups have limited extension in their hock joints. Most breeds of dog have hock joints with approaching 180 degrees of extension where by the foot can be brought into line with the tibia or lower limb. Many German shepherds can only achieve something like 150 degrees of extension and it is mechanically impossible to increase the extension angle (figure 1). This results in increased hock flexion which in turn also increases the flexion of both the stifle and hip joints causing the pelvis to be closer to the ground. To understand this better try standing on tip toes in a crouched posture. When moving from a crouch to an upright position, the ankles, knees and hips all extend together, and then flex together when crouching.

The next piece of evidence is that German shepherds are more prone to hip arthritis than other breeds. The PennHIP method of assessing hip dysplasia is based on measuring the looseness or laxity of the hips and the degree of laxity is objectively measured and is called the distraction index. The distraction index reflects the likelihood of the dog developing osteoarthritis of the hips later in life. In the graph below (figure 2) the sigmoid curve of the German shepherds shows a higher tendency to develop osteoarthritis by two years of age than the curves of the other three breeds.

It is postulated that this is due to the altered biomechanics of the hip joints from weight-bearing with more hip flexion.

With this logic a sloping topline causes an increased risk of developing hip osteoarthritis and it is therefore undesirable. Osteoarthritis will not occur however in dogs that are free from hip dysplasia that have tight hips and this

means a distraction index of ideally less than 0.3. Unfortunately using low BVA/KC hip scores will not guarantee staying free of osteoarthritis. A paper soon to be published shows that greater than 50% of dogs scored as excellent under the OFA hip scheme in the USA (this is similar to the BVA/KC scheme) went on to develop osteoarthritis.

The other question asked about the sloping topline is its influence on the biomechanics of the spine as German shepherds are prone to degenerative intervertebral disc disease that can cause hind limb weakness and a wobbly gait. The answer to that question is unknown and would be opinion only. CDRM or degenerative myelopathy is a totally different disease and is not influenced by conformation.

On a more positive note German shepherds have a low incidence of cranial cruciate rupture and disease when compared with other common breeds of similar size. It is postulated that this is due to the increased flexion of the stifle that alters the functional tibial plateau angle (this is all technical jargon and is outside the scope of this article).

Therefore if the sloping topline is bred out may be cruciate problems with resultant stifle osteoarthritis will be substituted for hip osteoarthritis!



Figure 1. This shows the maximum extension of the hock of a German shepherd dog.

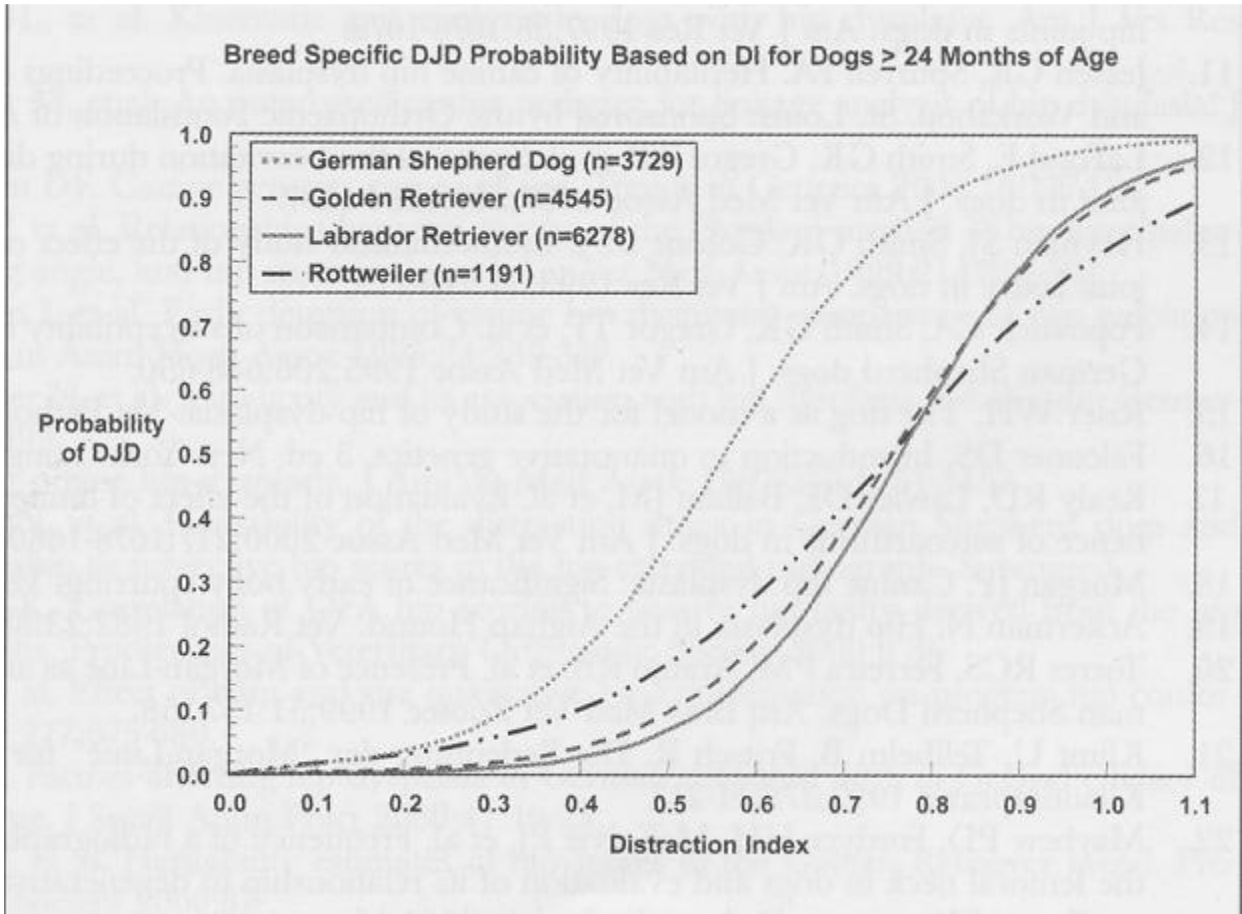


Figure 2. This graph shows the probability of a dog of one of the specified breeds developing osteoarthritis of the hips by two years of age. The German shepherd dog has a greater tenancy than the other breeds.

Note that DJD is short for degenerative joint disease and is the same as osteoarthritis.