

SECOND EDITION UPDATES

# THE DEFINITIVE GERMAN SHEPHERD DOG



LOUIS C DONALD

## **The Definitive German Shepherd Dog**

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# Foreword



One hundred years ago, the breed's creator, Captain Max von Stephanitz, wrote and published the book *'The German Shepherd Dog in Word and Picture'*. In the preface to his book, he said, *'In writing my book, the motive is to be of service to all interested lovers of our best friend, the German Shepherd Dog.'*

Over time, the sciences, sociology, understanding of genetics, anatomy, husbandry, welfare and diversity of canine service have changed significantly, requiring a new all-encompassing book on the German Shepherd Dog catering for the novice through to the breed expert that reflected these changes and current day breed enthusiasts and owner's needs.

I have read the book by Louis Donald titled *'The Definitive German Shepherd Dog'*. A book that has evolved from a lifetime of experience with the German Shepherd Dog, encompassing his involvement as an obedience dog instructor, club president, breed surveyor, breeder, exhibitor, SV breed judge and lecturer, combined with 20 consecutive years as President of the German Shepherd Dog Council of Australia.

With the same motivation as Captain von Stephanitz, *'to be of service to all interested lovers of the German Shepherd Dog'*, Louis has very effectively progressed the von Stephanitz tome, writing and publishing a book comprising 1,135 pages, more than 1,300 images and over 750 named photographs of dogs of breed influence.

***'The most significant and important book published on the German Shepherd Dog since the work of Captain Max von Stephanitz.'***

This book is a comprehensive and scientifically sound body of work, seamlessly following the *'word picture'* providing in-depth information to a broad spectrum of canine enthusiasts; family dog, show dog, dogsport, service, security, police, search and rescue dog, obedience, herding, agility, seeing-eye, tracking, military, and rehabilitation dog. Additionally, there are extensive collaborative chapters covering nutrition, veterinary and genetics.

The substantial written and pictorial chapter on the breed's development over the last 120 years provides an honest and in-depth appraisal of some of the most turbulent periods endured by the SV. It exposes the challenges, rewards, frustrations and disappointments that paved the way for successful breeding programs. It also emphasises the great importance of those people assigned the role of 'breed guardian' to ensure that the breed's fundamental reason for being, which is enshrined in the breed standard, is respected and upheld.

Importantly, this book presents the current view of the German Shepherd Dog in a factual and thoroughly researched way. The canine anatomy and locomotion chapters provide the most up-to-date research and knowledge, with highly detailed descriptions, diagrams and images of canine morphology supported by an extensive reference bibliography allowing the reader to further their research and studies on specific topics.

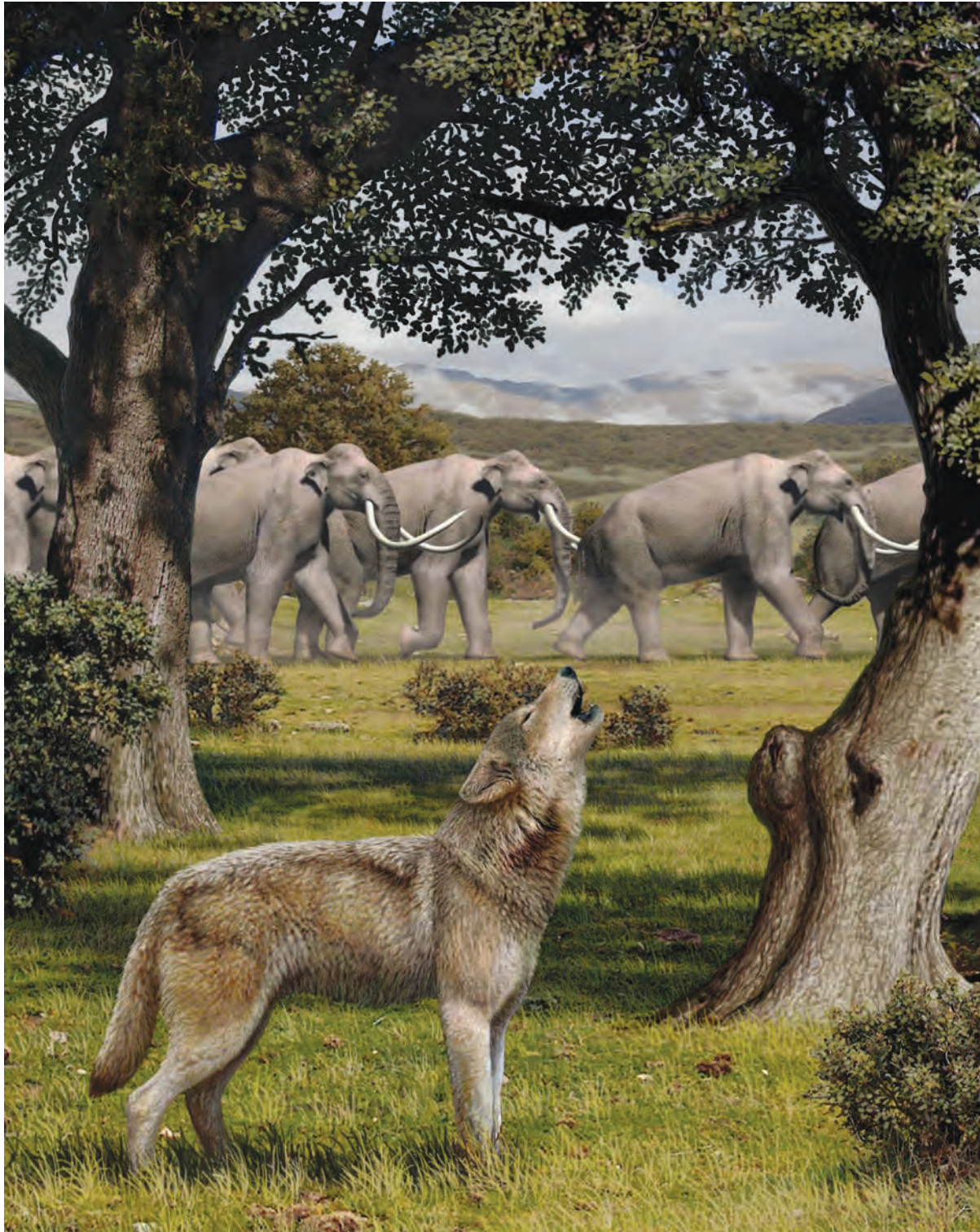
In conclusion, I not only recommend it to every owner of a German Shepherd Dog but proclaim it the new *'German Shepherd Dog Breed bible'*, a book that I have no doubt will serve the breed well for the next one hundred years.

SV/WUSV President –  
Professor Dr Heinrich Meßler

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# The Evolution of Dogs



*A scene in western North America during the late Pleistocene. An adult Dire wolf (*canis dirus*) calls for its pack while a herd of Columbian mammoths (*Mammuthus columbi*) ambles past in the background - artist Mauricio Anton*





A scene in western North America during the Miocene. A pack of wolf size borophagine *Aelurodon ferrox* is in pursuit of a three-toed horse of the genus *Neohipparion* - artist Mauricio Anton

### Canids:

*Canids* are dog like creatures including wolves, jackals, coyotes, foxes, wild dogs, dingoes and dholes, with a total of 13 genera and 36 species extant (still in existence). They belong to the order *Carnivora*, placental mammals with a diet consisting almost entirely of meat. [Macdonald, Zubiri. (2004)].

*Canidae* has two subfamilies being *vulpini* which includes the foxes and *canini* which includes wolves, jackals, coyotes, dholes, wild dogs and dingoes.

Members of the mammalian order *Carnivora* are the descendants of a successful late Paleocene radiation of mammals whose primitive food habits were carnivorous. The name "*Carnivora*" is sometimes taken to mean that members of this group are all carnivorous or that all carnivorous mammals are members of this group.

This is not so. Members of *Carnivora* have diverse food habits, although many are primarily carnivorous, and carnivory is widely distributed in mammals, being found in many other orders including bats, marsupial mammals, primates, and dolphins and whales.

Most members of the order *Carnivora* can be recognised by their enlarged fourth upper premolar and first lower molar, which together form an efficient shear for cutting meat and tendon. These teeth are referred to as the carnassial pair.

The exceptions are a few forms, such as bears, raccoons, and seals, in which these teeth are secondarily modified. Besides usually having carnassials, almost all *Carnivora* retain the primitive number of incisors (3/3). (Stains, 1984; Vaughan, et al., 2000).

# Formation of the Schäferhunde Verein - SV



*Captain Max Emil Friedrich von Stephanitz*

*Extracts from the works of Winifred Strickland Carson (1974) - photos and supplementary comment by the author.*

## **The Beginning**

The young German cavalry officer stood in thought on the crest of the hill overlooking the River Rhine, and watched the Shepherd tending his flocks in the valley below. For three days every moment he could spare away from his regiment had found him studying and contemplating the pastoral scene below.

The sheep in this part of Germany were large and tough and appeared to be almost more than a match for the small dogs herding them. At times the Shepherd, nonetheless, dozed unconcerned under a nearby tree while his dogs kept constantly on the move, watching over the sheep. They kept the sheep from straying into the clover field nearby, herded them together when carriages approached on the road, and permitted them to scatter and graze when it was safe. The sheep, with their voracious appetites, were persistently straying too far afield and the dogs worked continually to keep them contained.

While the young man watched, fascinated by what he saw, he envisioned a dog of medium size who could cope with the two different sized breeds of sheep found in Germany. He saw a dog who would be extremely intelligent, quick on his feet, protective if necessary, noble in appearance, trustworthy in character, physically sound so that he could work tirelessly all day long and be born with an innate desire to please. A dog who could reason and be a companion to man.

He greatly admired those dogs with a wolfish appearance and prick ears, who were intelligent, had sharp senses and great willingness to work. As the young man's ideas crystallised, he came to the conclusion that he would breed such a dog and make it available to Shepherders all over Germany. When the far-sighted cavalry officer, Max von Stephanitz, returned to his regiment, he promised himself that he would bring a utilitarian breed of dog into being. And so it was, this day in the 1890s, that the idea of founding a new breed came to be - the German Shepherd Dog.

anatomy, you can, in your mind's eye, see the dog's construction no matter how it is standing. Only the novice requires the dog to be standing in a perfect pose to assess its construction and even then needs other dogs of note to be available to compare it against in order to make an assessment and evaluation.

The last comment is this: whilst there is a comprehensive genetics chapter in this book which was written by Dr Malcolm Willis, there are five important points that relate to genetics that the serious student of the breed should keep well to the fore of their mind as they read the following tail male chronological phases, especially the last development phase of 1990 - 2020.

### Point 1: Germplasm

Notwithstanding very rare mutations, the genes in dogs we see today existed in the germplasm of the grey wolf and therefore existed in the earliest herding dogs. It is the same genetic soup, just reorganised.

### Point 2: Inheritance of characteristics

People often refer to the influence of individual dogs contained within a pedigree. Indeed, many people talk about the influence of Canto and Quanto von der Wienerau on current-day dogs, and they sit at about the 11>12th generation on most current day dogs' pedigrees. In genetic terms and relative to their position on a pedigree, how much influence do ancestors actually have?

Each generation going back doubles the number of ancestors based on a mathematical formula, 'kinship coefficient' [Sewall, Green, Wright, (1925)]. The formula applies to this question of ancestral influence, including any linebreeding that might exist on certain dogs, i.e. increase the allocated percentage by the linebreeding factor. If a particular dog is linebred in the 3rd generation, instead of 12.5%, it becomes 25%, just as though it were a grandparent in the 2nd generation. But it's not that simple!

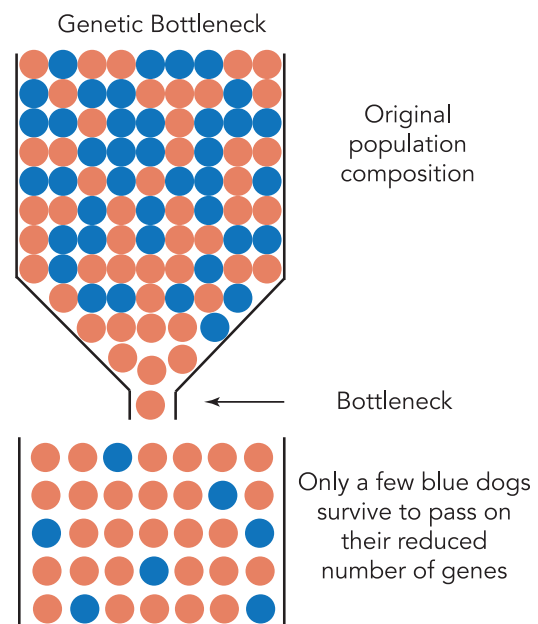
*'These percentages are great in theory, but in practice, whilst a dog gets half its genes from its father and half from its mother, it may get anywhere from none to all from a grandparent. The presence of any dog in a pedigree is no guarantee that the animal bearing that pedigree carries any genes from a particular ancestor, and*

*the further back that ancestor is in the pedigree, the less the likelihood'. [Willis, (1967)]*

### Point 3: Genetic diversity

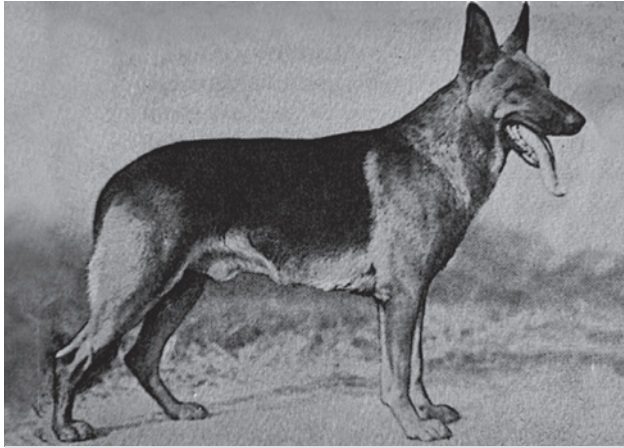
A great deal of the breed's development has been based on inbreeding, even in **recent times, where** it is referred to as linebreeding, and this impacts on genetic diversity. Whilst inbreeding and close linebreeding has its benefits, if there is no genetic diversity, if the majority of dogs are genetically the same, selection scope is impeded in the ensuing generations, and this has downside consequences.

To be more specific, a higher selection intensity (inbreeding) leads to achieving the breeding goal faster, but what if the intensity becomes too high because a very small number of males are selected and therefore highly influential per generation? In that case, the 'effective population size' becomes smaller, and this is called a 'genetic bottleneck'. When the inbreeding becomes too high, the loss of favourable alleles due to 'random drift' becomes real. As you read this chapter, you will see heavily promoted males who were used extensively, leaving other breeding dogs, some of considerable merit, with no chance of playing a part in the breed's development. This creates both the value and the downside of the Sieger system or any system where a single dog, or even four or five, are placed



*A simplified example of a genetic bottleneck*





1926 and 1928 Sieger - Erich vom Glockenbrink SchH I SZ 275752

Erich was Dutch and Austrian Sieger of that same year. He was too short in body and extremely sharp in character. He was sold to America, where he made a big impression and was then on-sold to China no doubt in part because of his character. Erich produced 491 progeny and a disappointment in breed terms, throwing faulty dentition and cryptorchidism. His line continued with his son Harras vom Glockenbrink, the grandfather of Dachs von Bern.

*'Dachs is a very beautiful dog, but no hero. Today he would not pass any German temperament or character examination, nor would he be approved or entered into the Körbuch as a dog suitable for breeding.'* [Alfred Hahn, (1935)]

Arko von Sadowaberg linebred 3,5 - 5,5 on Jung Tell, a shallow chested 68.5 cm dog in the style of Erich



Dachs von Bern - SZ 429017



1927 Sieger Arko von Sadowaberg SchH III SZ 253490

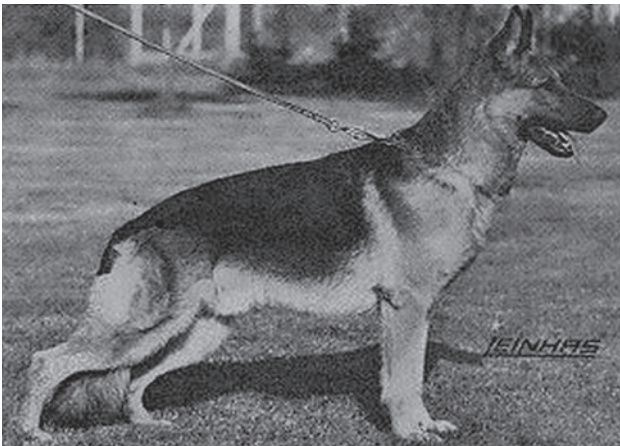
vom Glockenbrink was the German Sieger of 1927 and Holland Sieger of 1928 and, like many dogs before him, was sold to America. To all reports, he was an **outstanding mover**, and whilst he did very well in the show ring, he contributed nothing to the breed in America.

By the end of 1928, Arko was exhibited in America 30 times for a remarkable 28 times Best of Breed. Schaeffer rated him as an excellent dog but gave him a three in character. A weak jawed dog, there was talk of him being overshot, as was his father. An American report said he was rich black and tan and characterised by unusual length, good firmness of back and deep angulation of the hindquarter.

In 1930, Dr Kurt Roesebeck, who, at the time, was number two to Captain von Stephanitz, judged a large German Shepherd Dog breed show in America. The show ran out of light and presumably because of the upset created by his decisions in the Open Dog class, Dr Roesebeck later said it was so dark he was trying to judge shadows. It was here that Arko suffered his most significant loss. To the utter astonishment of all present, Dr Roesebeck gave first place to a relatively unknown dog called Bimbo vom Stolzenfels. The spectator astonishment was not just because Bimbo was in front of Arko, but because he was also in front of a few other notable dogs, such as 1924 German Sieger Donar von Overstolzen, 1925 German Sieger Klodo vom Boxberg, 1927 German Sieger Arko von Sadowaberg and 1929 German Sieger Utz vom Haus Schütting. If nothing else, a sobering lesson regarding the sport of showing dogs.



*Canto von der Wienerau Image: Alquati*



*Canto von der Wienerau Image: Leinhas*

advice' that Piero decided not to buy Canto, who died a few months after this photo was taken!

Notwithstanding that Canto died at four years of age, it is not surprising he did not have much of a show career when reading his breed survey report. He was SG at his first show in the youth class under Dr Simon and later V1 in Mannheim.

Canto produced better sons than daughters and 117 registered progeny before he died. I spoke with Walter about Canto at some length, asking him why he had used a middle of the road SG dog like Hein vom Königsbruch on Liane, and of course, enquired about how Canto had died. This conversation took place prior to Canto being declared a haemophiliac, a fact that was denied until his daughters began to produce affected males.

Regarding the circumstances of Canto's death, Walter told me he was judging a show in America when he got a telephone call from his kennel manager to say Canto was running around the garden of the kennels and ran headlong into a tree. The impact had injured his fore-chest, caused some internal bleeding that was not detected in time, and he consequently died from internal bleeding. Whilst Walter didn't know it when telling me the story, because Canto was a haemophiliac, the trauma he received to a blood vessel in his chest, most likely at the point of the shoulder, caused him to bleed to death!

Using Hein was in many ways Walter's greatest intuitive master-stroke. Walter told me that even though it was distant, linebreeding on Axel von der Deininghauserheide gave a sound blood base. That importantly, it incorporated the very well-constructed and typey successive dogs; Asslan vom Maiweg > Alf vom Walddorf Emst > Rolf vom Osnabrücker Land. He said he liked the idea of a more stretched body **with a longer** and better laid croup and more hind angulation as it gave an expansive gait and that later, when Quanto was incorporated, strength, substance, and his preference for black and red colour would be covered. I asked about Hein's weak character - with trepidation. He said he was 'super confident' Liane > Dixie would cover it - 'no problem', and that the Jalk vom Fohlenbrunnen and Arno vom Haus Schwingel lines were very strong in character. And then, when incorporating Quanto, this would be linebreeding on very strong character via Dixie and Jalk.



*Hein vom Königsbruch SchH II SZ 1102816*

angulations a bit lacking, at the time, Herman stated they were very good. He certainly had a very good length and lay of the shoulder blade, and critically the angulations of the fore and hindquarters were well balanced, as was his chest depth to foreleg length ratio. He was sound in all his joints, correct standing and stepping from the front and rear, and all of this translated into joyful, spacious, free and roomy, rhythmic, ground covering movement. He strongly recommended him to females of the Quanto line. It could be said that in Herman's mind, Dingo's side gait set the standard by which future dogs would be measured.

Herman said of Dingo's gaiting, *'The basis of Dingo's fleet-footed movement, in particular when gaiting off lead, is attributed to his always having had overall firmness and dryness as well as unity of all parts.'*

The selection of Dingo represented a return to close inbreeding and heavy promotion of Canto von der Wienerau and Quanto von der Wienerau at the expense of Marko vom Cellerland and to a lesser degree, Mutz von der Pelztierfarm.

There is a general view outside Germany that when Herman replaced Dr Rummel, he abruptly and unfairly terminated the Marko line. However, by studying the decisions and remarks made by Dr Rummel at the 1973 Sieger Show, Marko was on the slide before Herman took over the presidency. Herman told me he wanted to see Mutz and Marko's influence continue but that neither dog, particularly Marko, was convincing enough for him in the context of their progeny complying with his vision of the German Shepherd Dog. In effect, Herman confirmed what Dr Rummel had already conceded. In the case of Marko, anatomically speaking, there had only been a few very good sons. The top son was Eros vom Hambachtal, but like all the best Marko sons, he did not produce anything as good as himself.

So with this background, Herman's actions at the 1983 Sieger Show effectively reduced the four pillars of the breed to two, Quanto and Canto von der Wienerau. This forged a new 'style', bearing the hallmark of black and tan/gold, trending progressively to black and red colour, stretched proportions, more pronounced forehead angulation, and an animated, highly alert, expansive side gait; sometimes at the expense of soundness.

At this show, Herman gave 11 VA awards, and the outcome in bloodline terms was as follows:

- VA1: Canto von der Wienerau inbred 2-3 Quanto von der Wienerau 3rd generation dam's side
- VA2: Quanto linebred 4-3 Canto 3rd generation Mutz linebred 4-4
- VA3: Quanto and Mutz both 3rd generation sire's side
- VA4: Canto and Quanto 3rd generation and Palme on both sides
- VA5: Quanto 3-4 Canto 3rd generation dam's side
- VA6: Quanto 3-4 Mutz 3rd generation
- VA7: Quanto 4th generation Mutz 3rd generation
- VA8: Quanto 4,5-5 Canto 4-5
- VA9: Canto 2nd generation Quanto 3rd generation Marko 3rd generation
- VA10: Canto 3rd generation, Mutz 3rd generation
- VA11: Canto 3-4 Mutz 4th generation

One must add the remark to this incestuous outcome that Canto and Quanto are related via the 'L litter Wienerau'. Whilst often referred to as dogs of separate lines that 'clicked', they are effectively the same line. Liane von der Wienerau is Canto's mother, and Lido von der Wienerau, her brother, is Quanto's grandfather on the mother's side.

Aside from the profound effect this Sieger Show had on narrowing the blood base in Germany, it also had the benefit of assimilation with Canto's very good overline (with height, backline, croup length and lay) and hind angulation being beneficial to Quanto, and conversely Quanto's very good forehead angulation, colour and strength complementing Canto. This was a 'match made in heaven' for Herman and Walter, a pairing of two dogs that would result in a very successful and rewarding outcome for them both.

In terms of genetic frequency, the loss of Marko and a short time later, Mutz, very gradually and unnoticed by many show dog enthusiasts and 'breed experts', led to a decline in the strength of character; aggressiveness, nervousness, disobedience, hyperactivity and neediness, increased. Despite a courageous but failed attempt in 2000 by Peter Messler to introduce some diversity of type, colour, and at least in principle, a measured degree of new blood via Timo vom



dogs, his downward lumbar spine bend represents a 'major fork in road' event that has perpetuated to this day, to the point of being 'normalised', accepted by many show judges, rarely mentioned in critiques, and accepted by breed enthusiasts.

In 1988, Jeck was SG59 in the JKL Class under Erwin Wieser, who criticized him for lack of firmness, peaked backline, soft ears and poor gaiting performance. Erwin also made a critical comment about the peak in Jeck's backline after Herman made him Reserve Sieger in 1992 and again when he was made Sieger in 1993. In discussions with the author, Erwin predicted it would be a retrograde decision for the breed to make Jeck Sieger! No matter the many valued traits of Jeck in all other respects, Erwin was not only brave in expressing his remarks but right in doing so. By his status and traditional influence as German Sieger, Jeck not only legitimised a curvature/downward lumbar spine bend, but as part of the process, redefined the words 'straight back' for many SV and overseas German Shepherd Show Dog specialist judges.



Erwin Wieser

Jeck's promotion to Sieger represented a breed milestone in developing this spinal characteristic and its impact on the croup angle, lowering the hip/knee height position and increasing the hindquarter angulation. This is demonstrated quite graphically in the un-touched, historically important photo of Zamb and Jeck. In terms of comparison, both dogs are standing virtually identically insofar as the position of their forelegs and rear feet with Zamb's thoracolumbar spine, croup angle, hip and consequent knee height and hindquarter angulation in stark contrast to that of Jeck.

In hindsight, people could only see the hindquarter change - a deeper angle, along with the tail contacting the ground, and they liked it! Extraordinary as it may seem, very few people, including 'breed authorities' saw the change in the backline, the change of angle in the thoracolumbar spine, and many still don't! Yet, many are convinced it enhances hindquarter locomotive efficiency and stride distance. It is now reflective of the breed's evolution.

In 1992, the Sieger Show was held in Düsseldorf, and Jeck was Vize-Sieger to Zamb based on their progeny. Whilst Jeck only produced two German Sieger Show graded VA animals, he did produce many high-quality V progeny. Generally, he gave large animals with good strength and substance, good heads, was prepotent to himself and notwithstanding his faulty backline, otherwise very good construction, proportions and colour. The problems generally attributed to him by the few breed authorities who have gone to print are



Left to Right: Zamb von der Wienerau and Jeck vom Noricum



the President and his prime objectives. However, in the end, the majority went with the flow. For other than for a few exceptions, the majority modified their breeding until the next change of guard, hopefully a person who shares their opinions, and then the whole cycle starts again.

As a result of the removal of Dr Raiser as Federal Breed Warden, the Board elected Erich Orschler to judge the open class males at the 2003 Sieger Show, and this created a whole new ball game and political dynamic.

There are notable exceptions in one trait or another, but in terms of the overall picture, this period represents an increase in the genetic frequency of large, substantial bodied dogs with improved forehead angulation, powerful and sometimes overly robust, lippy male heads, better length of underchest but proportionately deeper with consequent shorter forelegs. A normalising of black and red show dogs with deep and too often overangulated, unstable hindquarters, an increase in the number of dogs with a curved/downward sloping lumbar spine - critiqued as a straight back and large soft ears. In the context of a 'working dog', there was a deterioration in some key aspects of working dog character and the show dog/working dog divide was further widened. The phenomena of SV judges allowing a crowd-enthraling very fast side gait, continued unabated.

I make a specific note here regarding the downward lumbar spine bend and its consequent hinge-like peak. Quite early in this period, photoshopping was progressively used to 'fill in' the lumbar section of the back to hide the peak. Starting at the base of the neck and ending at the upper section of the tail, this gave the dogs photographic image one continuous curved, perfectly clean topline. For many photos, often officially endorsed, there are no more dips, peaks or high set tails and it is no longer discernible as to where the withers started and the croup ended.

It is always a very sensitive subject when commenting on the faults of a dog, and more so identifying the dog and thereby its owner or breeder. This fact has great relevance to this final section because the overwhelming show dog consensus **is if you can't say something nice about a dog, don't say anything. Especially if you are the breeder, owner, or have a**

**vested interest in the dog or its bloodline.** This attitude is entirely understandable when applied to novices, but not individuals who put themselves forward as breed authorities. Over the years, this attitude has given a misleading impression of the breed's development, in many cases a misleading impression of some important stud dogs and now exacerbated by photoshopping. I empathise with the principle of 'if you can't say something nice, say nothing', however, if I followed that line of thought, it would have been impossible for me to have written about the breed's 120 years of development with honesty, arm length objectivity and most importantly for the breed, value and meaning!

*'If we are sincere about the breed, we must have a true picture of the animals whose germ plasm has fashioned our stock. We must know what is behind them and what hidden faults or virtues have been handed down through them to our own animals.'* [Captain WM Goldbecker, (1967)]

Based on a now SV agreed two-year contract term for adult class Sieger Show judges, the first Sieger Show after Peter Messler passed away, was judged by Erich Orschler of 'vom Batu' kennels in his senior ranking capacity as Vice President of the SV, with Leonard Schweikert judging the females for his second term. Erich became an SV breed judge in 1971, a Breed Surveyor in 1975.



Erich Orschler

and protractor' content and is an excellent reference book for those who have a technical interest in the breed, both anatomically and biomechanically. The content of Gorrieri's book forms the basis for a number of technical drawings and computations in this book.

He set an extraordinarily high benchmark for the breed, which was built around its core premise of being fundamentally a working dog. In 2009, Luciano Musolino became the President of SAS. His progressive leadership and management style taking SAS and the breed to even loftier heights over the next decade. Sadly, on 2 January 2022, after returning from an overseas judging trip, Luciano succumbed to Covid-19, aged 62.

In addition to the 2021 VA's Mondo and Uvo, the following Italian bred males have achieved the VA grading in Germany:



*Marko della Valcuvia SchH III SZ 2136091 VA7 2005 Image: Urma*



*Dux della Valcuvia SchH III SZ 2052621 VA6 2001 VA8 2003 Image: Urma*



*Furbo degli Achei SchH III IPO SZ2213251 VA9 2008 Image: Urma*



*Pakros d'Ulmental SchH III IPO3 SZ 2138739  
VA9 2004 VA4 2005 VA4 2006 VA1 2007 Image: Urma*



*Fulz di Zenevredo SchH III IPO2 SZ 2250707  
VA 2013 - VA 2014 Image: Aldo*





*Cobra d'Ulmental SchH III SZ 2267319 VA 2013 Image: Magicon*



*Zenit di Casa Palomba IPO2 ROI 15/34694 VA11 2018 Image: Aldo*



*Quoran d'Ulmental SchH III VA9 2015 VA5 2016 VA7 2017 Image: LCD*



*Spencer di Casa Massarelli IPO3 LOI 16/68982 VA8 2019 Image: Aldo*



*Cronos del Seprio IPO3 SZ 2304505  
VA9 2015 VA5 2016 VA7 2017 Image: Aldo*



*Dingo di Casa Mary IPO3 ROI 14/124039  
VA10 2018 Germany - VA1 2018 Italy - VA1 2019 UK Image: Fanino*

## American Confederation of the German Shepherd Dog - COAPA



*Roberto Caputi - President COAPA Image: Gretta Gunter*

In terms of clubs outside Germany that have had and continue to have a very strong and positive influence on the breed is the American Confederation of the German Shepherd, an entity that brings together clubs specialising in German Shepherd Dogs throughout the Americas.

Founded in 1965 as the South American Confederation of the German Shepherd Dog - COSUPA, its main functions were to establish fluid contact between clubs, with its main objectives being the unification of technical criteria and minimum regulatory standards of mandatory use for its members, technical support for less developed members and mediation to seek solutions to conflicts that may arise among its affiliates or with other entities and to maintain close ties with the WUSV.

The honorary President of COSUPA was Dr Werner Funk, President of the SV, and its President was Mr Julio Brisola and consisted of the countries Peru, Colombia, Argentina, Brazil, Chile and Uruguay.

Julio had excellent contacts in Germany, such as the SV President Herman Martin and this kept the flame of COSUPA alive in its early days of development and organised annual breed congresses and judging Circuits judges by SV judges.

COAPA came about because of the need to expand COSUPA throughout America, including Ecuador, Paraguay, Mexico, Costa Rica, Panama and Guatemala, with some sporadic presence of the USA and Canada.

COAPA today is formed by 20 countries; Argentina, Bolivia, Brazil, Canada, Colombia, Chile, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Nicaragua, Panama, Paraguay, Peru, the United States, Uruguay and Venezuela.

President of COAPA is Mr Roberto Caputi, a WUSV Board of Management member and owner of the very successful di Casa Caputi kennels from Ecuador.

Together with his Board of Directors and representatives of COAPA member clubs, he has very effectively consolidated COAPA at a world level, with active training of COAPA breeding and trial judges conducted under the guidelines of the SV and WUSV.

In recent years, breeders from countries under the COAPA umbrella have achieved extraordinary results in their breeding programs, and a number of these dogs have been exhibited at the Sieger Shows in Germany and other European countries.

The following COAPA bred dogs have competed successfully at Sieger Shows in Germany, achieving the VA grading.



*Anta vom ben Harten 6419 SchH 2 IPO 1 Image: Köber*





*Kronos von Nürburgring 7891 IPO 3  
Image: Urban*



*Jax dei Precision 535708 IPO 3  
Image: Vartanyan*



*Nero von Ghattas 1389 IPO 3  
Image: Gish*



*Asap vom Aldamar 233634 AD IPO3 IGP 3  
Image: Vartanyan*

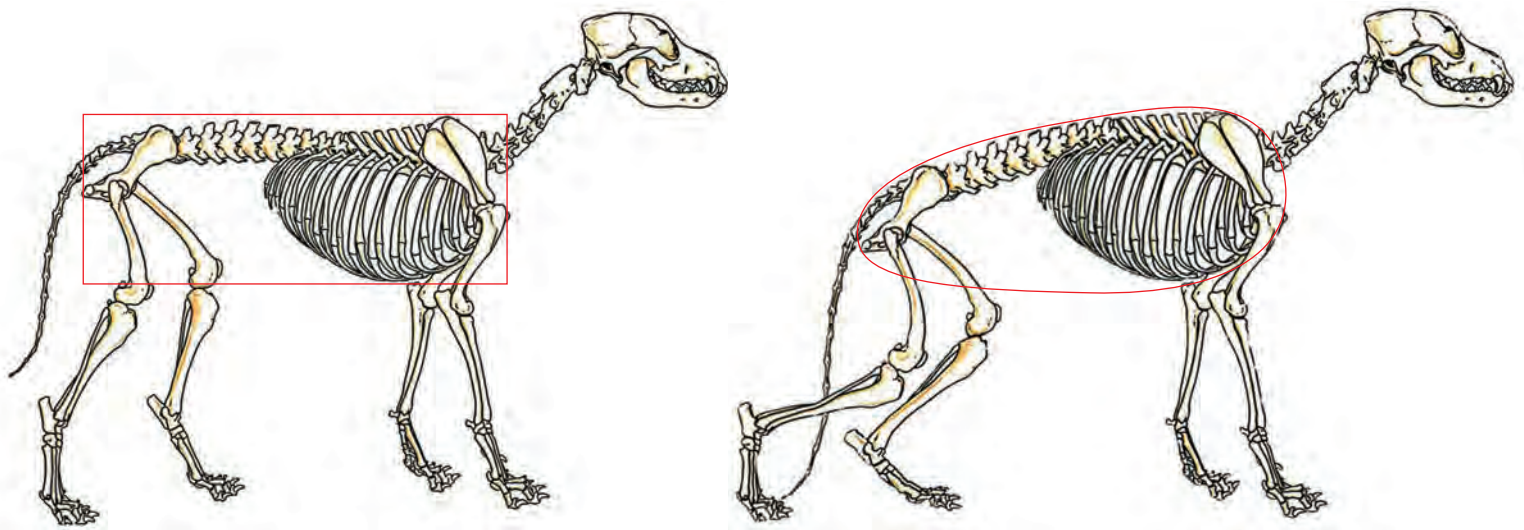


*Tell von Ghattas 16569 IPO 3  
Image: Gish*



*Baisha di Casa Caputi 17811 IPO 3  
Image: Creative@rt*

# Development of the German Shepherd Show Dog Skeleton



1899

2020

A number of characteristics constitute developmental change in the German Shepherd Show Dog since its 1899 beginnings, but nothing has been more significant than changes to its skeleton. Other than a general wolf-like appearance, the contemporary German Shepherd Show Dog is profoundly different from its originating shepherd dog form.

This chapter relates to the gene/allele frequency in the majority of the German VA and top V dogs in the context of the average mean.

The German Shepherd Show dog skeleton has progressively increased in size and body mass and changed its geometric form from a horizontal rectangle to a slightly sloping obloid.

The main skeletal changes contributing to the geometric change are: an increase in withers height, the rising of the anticlinal region of the spine, a downward lumbar spine bend, a more inclined pelvis and **lower hip and knee position, and longer tibia.**

## THE TRANSITIONARY GERMAN SHEPHERD DOG SKELETON 1899 - 2020

This change has been highly visual, with the upperline and hindquarter the predominant feature that people focus on and debate. The changes have impacted the dog's biomechanics, and how the muscles, bones, tendons, and ligaments work together to produce movement. During the trot, it has impacted the dog's stride distance, stability, agility and power of endurance.

Over time, changes to the dogs' skeleton have been subtle, sometimes not even noticed. Initially, the changes are planned improvements designed to attain an objective; an alignment with the breed standard. Having achieved the objective, changes then occurred that served no purpose for other than satisfying the human predilection for exaggeration of form.

Examples and explanations of the progressive changes at various time frames are as follows:





*Maremma*

The Maremma Sheepdog originated in Italy. It was bred and trained to protect a place and or property and, in particular, sheep. They are inherently large, powerful, absolutely fearless, highly muscular, imposing dogs with a head and jaws designed for the purpose.

### **Specialist Guard Dogs**

Guard dog breeds tend to be territorial, averse to strangers, dominant, protective and have a very strong sense of loyalty to you and your family. They are highly alert and observant and act obediently.

An ideal guard dog is typically large, with powerful head and jaws, is utterly fearless, and very responsive to training.

They have an intimidating physical appearance highlighted by a look in their eye that makes their function and character very clear. Just the presence of one of these dogs is often enough to frighten off an intruder, be it another dog or a human.

As with sheep guarding dogs, locomotive efficiency, an effortless, ground-covering enduring trot with great agility **is not nearly as important for a guard dog as sheep tending, sheep herding dogs with a protective aptitude.**

Specialist guard dogs are decidedly reserved with strangers, fiercely territorial, and highly protective. High arousal, strong drives, and a decisive 'take no prisoners' attack can be functional in certain environments, but this characteristic can become pathological and lead to unnecessary attacks and injuries in a safe and benign environment where a high arousal level, and aggressiveness are not necessary.



*Guard dog - Cane Corso. Image: 'For Dog Trainers'*

Like the Maremma, the Cane Corso is of Italian origin and the ancient Molosser family of Roman descent. It was bred to protect property and family and hunt big game such as wild boar. Highly intelligent, independent, and inclined to be 'bossy', they are known for their fierce loyalty and suitability as guard dogs. In the wrong hands they can become problematic; too sharp and aggressive. Like all guard dogs, regardless of their inherent background and reason for being, they should be indifferent to strangers when approached and only react when a real threat is present.

### **Pain Threshold - Herding and Guard Dog Breeds**

Dog breeds differ in their response to pain, and the primary factor in the sensitivity to pain is genetic, reflecting the inherent background associated with the breed. Herding dogs, like German Shepherd Dogs, as a rule do not come across similar situations to guard dogs involving painful stimuli. Consequently, guard dogs such as the Cane Corso have been selectively bred

he was willing to come to Switzerland. The response left little doubt, 'Mrs Eustis, to get my independence back, I'd go to hell.' She accepted the challenge and trained two dogs, leaving it to Frank to decide the more suitable dog. Frank went to Switzerland to work with the dogs, one a black and gold male and the other a grey sable female, both German Shepherd Dogs. Not that he could see the colour of the dogs, he chose the grey sable who had been named Kiss but feeling that no 20-year-old man should have a dog named Kiss, he called her Buddy.



Morris Frank and Buddy

Dorothy and Frank established the first guide dog training school in the US in Nashville on 29 January 1929. 'Guide dogs for the blind' was founded in America 13 years later (1942) by Lois Merrihew and Don Donaldson.

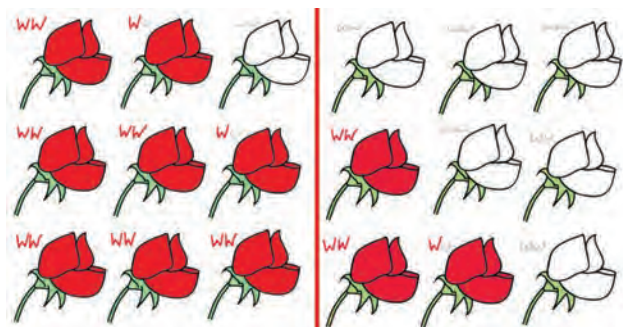
In about the same year, Lady Kitty Ritson, along with Miss J Workman, Captain Alan Sington and Lady Schuster from Britain visited the Potsdam school and eventually approached St Dunstan's British charity for the blind with a plan to train 12 German Shepherd Dogs. They turned down the offer, but in 1929 W. M. Eager,

Secretary-General of the Royal National Institute for the Blind, who was aware of this proposal, had a meeting with Mrs Eustis. In 1931, the first four British guide dogs completed their training and in 1934 the Guide Dogs for the Blind Association was founded in the UK.

## GERMAN SHEPHERD SHOW DOG VS GERMAN SHEPHERD IGP DOG

### One breed standard - two types!

The divide between German Shepherd Show Dogs and German Shepherd IGP dogs, historically referred to as working dogs, is as old as the breed itself. The only notation one could add to that comment is that the divide, which first became of major concern to Captain von Stephanitz in early 1909, never left him! It was an issue and divide he found impossible to resolve, and as the years have gone by, the divide has progressively widened. German Shepherd Show Dogs and German Shepherd Working Dogs now differ significantly in their genomic composition. Around early 2000 they drifted from being a different style of dog to arguably dogs of different type! The word 'divide' in this context refers not just to the bloodlines, construction and character of the dogs but to the enthusiasts within each divide.



Simple Mendelian diagrammatic. German Shepherd Working dog (red) German Shepherd Show dog (white) change in genome composition - circa 1920-2020

In terms of the population mean, when applying an overlay of the standard, the most distinctive traits of the German Shepherd show dog type are that they are glamorous and fully coated, generally rich black and red in colour, stand on the limit of size and body mass, have a spectacular far-reaching side gait, are well angulated in the forehead but deep in hindquarter and too often



of the East German dogs, a source of East German pride and a badge of their dog's uniqueness but such was the legacy of the anointed of the 1979 Sieger, Bodo vom Gräfental. However, others would see the development as being a progressive one, keeping up with the progressive West. Notwithstanding the requirement for strong and fearless character and pronounced drives, what occurred created a split within East Germany between the old DDR type and the evolving but still moderately angulated and just medium strong-boned, deeper chested Westernised type.

The moderation of fore and hindquarter angulation, medium substance, a level backline and grey sable colour, which is still in place today with working dogs, is due to the lack of influence by Quanto von der Wienerau, and particularly Canto von der Wienerau. The influence of these two dogs on the breed's development in the West was nothing short of profound, whereas it was negligible in the East.

Quanto was a 4th generation descendant of Rolf vom Osnabrücker Land, and Rolf had a significant influence on the DDR dogs, especially through Ali vom Gränert. However, for other than Enno vom Iglova, linebred 3-3 on Quanto, and his son, the three times Sieger Olf vom Fürstendamm and who, for other than backline, showed the influence of his DDR mother line traits, Quanto had little influence on the DDR dogs, it stopped at Rolf.

Canto, who was responsible for more stretched body proportions, lighter colouring, less strong character and deeper angulation of the hindquarter, did not get a foot in the door. In the context of working



DDR Sieger Show Judges and breed stalwarts: (L to R) Herr Dalm, author of *Die Zucht des Deutschen Schäferhundes in der ehemaligen DDR*, Herr Marx, Herr Wiesel, Herr Fischer

dog fundamentals, the former (Quanto) was a loss, particularly in regard to **substance and the underpinning** of strong character, whilst the lack of support for the latter (Canto) was a very definite gain for the DDR.

*'At the end of the DDR era, German Shepherd Show Dogs bred in the DDR were not competitive at an international level. The very strict rules applied to breeding and fundamental working/guard dog selection were discarded and replaced by SV rules. As occurred in Australia, when the 42-year ban was lifted there, anyone who had any involvement in show dogs sold them at a small price to purchase International standard West German dogs. For the committed DDR show-line enthusiast, this marked a new beginning, new lines, a new type and if they wished to remain involved in showing dogs, a very costly purchasing program!' [Steigler, (2020)]*

#### A WORD REGARDING CZECHOSLOVAKIAN DOGS

Czechoslovakian dogs, primarily from East German breeding lines, characteristically had a deeply embedded, inherent guarding instinct to protect family and territory from any perceived threat. When they exercised that instinct, it was with a 'take no prisoners' zeal and steely determination.

Before the 1989 revolution, which led to the fall of the communist government, the breeding of German Shepherd Dog was mainly to produce working dogs and service dogs. The breeding was done by one kennel, 'Z Pohranicini straze', owned by the Czechoslovakian army. The kennel was founded in 1955, and it bred and trained dogs for the sole purpose of protecting the Czechoslovakian People's Republic, and from 1968, the Czechoslovakian Socialist Republic's borders.

Above medium-sized dogs such as Gomo were selected, also requiring very strong nerves, high drives, large robust heads, good bone and substance, and to be lean and not heavy. The fore and hindquarter angulations were very moderate but well balanced. The dogs had to demonstrate high intelligence and were primarily dark grey sable in colour. All dogs were cared for by military

The core elements of the breed standard are those fundamental to the breed's purpose. To this end, it describes the dog's ideal characteristics, temperament and appearance that make the breed fit for purpose, fit for its inherent function as a working, sheep herding, guard dog. **Whilst the vast majority of German Shepherd Dogs will never be called upon to herd, tend and if necessary guard sheep, this fundamental core principal sits at the cornerstone of the breed. It must always be, observed respected and protected. This can't be overemphasised!**

Just like an engineer's blueprint, the breed standard establishes specifications; it does not explain them. Its specification is brief, allowing a degree of interpretation and latitude in certain parts but none in others. At its core, it is a document breeders should be using as a basis for breeding decisions and for judges to use to assess the dog's construction, character and gait.

One would prefer that there was only one official standard, a standard based on country of origin, Germany. However, there are three standards in existence, FCI/SV, American Kennel Club and British Kennel Club. The latter two being translations from the FCI/SV standard, with relatively minor amendments.

Once published, standards can and do get amended. The amendments tend to make vague statements clearer or eradicate worrisome faults, but sometimes to legitimise a trend, a style of dog driven by a very influential individual such as the SV President, SV Federal Breed Warden, large scale breeder, or a ruling faction. As a general rule, amendments tend not to be affirmations of moderation, but an inclination to exaggeration. Not because of some fundamental working dog requirement, but what appeals to the human eye, perceived as being beautiful, and if that isn't enough, the changing of specific words in a breed standard are subject to the interpretation of the breed's influencers, the influential breeders and today, in the case of the German Shepherd Dog, the SV Federal Breed Warden.

*'Most of the changes we see in life are due to truths being in and out of favour.'* [Robert Frost, (1914)]. In these words, Frost could be easily describing the relationship between many judges and breeders and the wording of the breed standard laid down as the blueprint for the breed. That is, ignoring the true

meaning, or the intentional misreading of the written design criteria for any breed is a form of wickedness because such an act suits the humans involved but rarely the dog. Can any genuine dog lover truly want to produce a dog that due to exaggeration of form cannot easily walk or trot? An exaggeration, claimed novelist and poet Kahlil Gilbran (1923), is a truth that has lost its temper. Being true to any breed involves respect for the breed standard and respect for the dogs of that breed. Exaggerating the physical features of a dog, to its subsequent detriment, indicates disrespect both for the breed design and, more importantly for the dogs themselves. Less well-informed members of the public have come to think of exaggerations in some pedigree breeds of dog as being typical, traditional and not affecting the animal's quality of life. Not so. The sad fact is, if you allow small exaggerations into a breed, usually initiated by a breeder of influence, those small exaggerations soon exaggerate themselves, and with a narrow gene pool, the exaggerations get more pronounced with each generation.

*'In the end, less honourable people will misuse any wording presented to them. The promotion of their style but referred to as their type and their own tendentious interpretation of the standard will be their preference, whatever the regrettable long-term penalties for their breed. It just needs one influential but misguided breed authority, breeder or dissident clique to put at risk over 100 years of devoted work by generations of worthier breed enthusiasts.'*  
Extracts [Colonel David Hancock, (2000)]

Anyone who is interested in the breed, especially someone who puts themselves forward as a 'breed authority', 'dog judge' or 'breed surveyor' needs to be very familiar with the standard when assessing the animal standing in front of them.

The need for a judge to be intimately familiar with the standard sounds like a no brainer, doesn't it? But you would be surprised how many judges read the standard to pass their judge's exam then never read it again as, in their mind, they are now a breed authority! They now know it all and have little to no interest in continuing their education, nor indeed reading a book such as this one.



## HISTORY OF THE BREED STANDARD

Many of the breed standards were written by dog people who knew and came from breeding horses. Horses were used for work, transportation and sport. The horse was as common then as the car is today and they applied horse knowledge and wrote dog breed standards in horse terms, often with horse bio-mechanical principles. The point being dogs and horses have very different anatomy and different parts that effectuate movement and gait.

The first breed standard for German Sheepdogs was written by the Delegierten-Commission which was founded on 26 April 1879 in Germany. Firstly, for the German hunting dogs and then the German luxury dogs. The book titled, *Geschichte und Beschreibung der Rassen des Hundes* (History and Description of the Breeds of Dogs) and published in July 1890 included a Breed Standard (Rassezeichen) for the German Shepherd Dog.

Based on the above, in 1895 Ludwig Bechmann published *The Book of Breed Standards*. His general remarks provide great insight into the Phylax Associations 'fancy dog/working dog split' and identifies in detail the variation in the types and size of sheepdogs in existence in 1890. In both its content and format, this standard played a significant part in the formulation of the breed standard written by Captain von Stephanitz and Arthur Meyer in 1899.

### **Breed standard for the 'Deutschen Schäferhunde' – Delegierten Commission 1895:**

**'Coat** According to coat type, three different classes or subclasses are to be accepted, namely

1) rough coated, 2) smooth coated, 3) long coated, which are more clearly described further on.

**Size** The size varies depending on the type of terrain. In large uncultivated pasture lands the dogs are larger and stronger than in highly cultivated areas, generally consisting of small parcels of grazing lands, where generally small, speedy, nimble dogs are kept. On average the size of the medium sized male sheepdogs is

around 55 cm and the bitches around 50 cm.

**Head** Medium size, to be light rather than heavy, the muzzle stretched, fairly long and moderately tapered, the fold at the commissure of the lips only moderately indicated, however the orifice of the mouth is not as uniform as that of the Spitz. The foreface in front of the eyes only slightly cut out, moderately arched, without a median furrow. The forehead rises at an angle, broadening upwards, the occipital bone only slightly pronounced.

**Ears** Medium long, standing erect, broad at the base, tapering to a point at the tip, long and close hairs inside the ears.

**Eyes** Medium size, almost small, slightly obliquely set, clear, lying to the front, with sharp expression.

**Neck** Of medium length and not appearing shorter because of the much longer coat here.

**Body** Chest reaching deep down, narrow in front, rib cage flat, belly tucked up, back straight or slightly bowed, croup short and falling at an angle, loin area broad and strong.

**Tail** Generally a downward carried bushy tail, the restless movement, (herding behaviour) and the constant alertness towards all that is happening in the environment, carried to below the hock joint, heavily coated on the lower side, normally carried hanging down, during excitement raised sabre like, never curled. Short or stumpy tails do not rarely occur, a congenital as well as an artificially created anomaly.

**Fore Legs** Shoulders set slanting, flat, elbows well let down, lower arms straight from all sides.

**Hind Legs** Thighs broad, rather flat, upper thigh bone long, in profile angled to the hock joints, absolutely straight from behind, rear pasterns short and fine. Hock joints very well developed.

**Paws** Small, roundly tapered, short and smooth coated, soles hard and nails tough.

#### **Coat**

1) Rough haired form: Here the individual hair is simply arched or bent, longer on the entire underside from the throat to the tip of the tail, also on the back of the legs down to the hock joints and down from the elbows. The feet are coated with short hair, the head also, without beard or

## 1899 SV German Shepherd Dog Breed Standard

## Die Rassezeichen der deutschen Schäferhunde.\*)

Nach den offiziellen Festsetzungen des „Vereins für deutsche Schäferhunde“, (SV.), aufgestellt in der ersten Mitglieder-Versammlung zu Frankfurt a. M. am 20. Sept. 1899 nach den Vorschlägen von A. Meyer und v. Stephanitz nebst den Ergänzungen der VI. Mitgliederversammlung zu Heidelberg am 28. Juli 1901.

**1. Allgemeine Erscheinung:** Der deutsche Schäferhund hat etwas über Mittelgrösse. Er ist ziemlich langgestreckt, kräftig und gut bemuskelt. Lebhaft und geweckt entgeht seiner Aufmerksamkeit und seinen scharfen Sinnen nicht leicht etwas. Die Rückenhöhe beträgt im Mittel für Rüden 60 cm, liegt für Hündinnen zwischen 55 und 58 cm. Sie ist mit Standmass als Höhe des Knochengerüsts bei angedrücktem Haar zu nehmen und zwar an einer den Ellbogen des Hundes schneidenden Senkrechten vom Widerrist zum Erdhoden. Für den Schäferhund als Gebrauchshund bei der Herde oder Diensthund der Polizei liegen die wünschenswerten Ausmessungen zwischen 55 und etwa 64-65 cm; Ueberschreitungen nach oben mindern den Gebrauchswert ebenso wie ein Zurückbleiben unter dem Mindestmass.

Wesensart wie hervorragende Charaktereigenschaften — Wachsamkeit, Treue, Unbestechlichkeit und Schneid — machen den reingezüchteten deutschen Schäferhund in vorzüglicher Weise zum Wach- und Begleithund (Schutzhund) geeignet. Gefällige Erscheinung ist anzustreben, doch darf die Gebrauchstüchtigkeit des Hundes dadurch nicht in Frage gestellt werden.

**2. Kopf:** Der Körpergrösse entsprechend, ohne plump zu sein. In der Gesamterscheinung trocken, zwischen den Ohren mässig breit. **Stirn**, von vorn gesehen nur wenig gewölbt; ohne oder nur mit schwach angedeuteter Mittelfurche. Die **Backen** verlaufen seitlich in

\*) Anmerkung: Die Ergänzung zu diesem Abschnitt bildet Abschnitt V des II Teiles: Die Beurteilung des Hundes.

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ganz sanfter Rundung und ohne hervorzustehen nach vorn. Der **Oberkopf** geht mit schräg verlaufendem, nicht scharf abgesetztem Stirnabsatz in den keilförmig zugespitzten, langen und trockenen Schnauzenteil über. Der **Fang** ist kräftig, die Lippen straff, trocken und gut anschliessend. Nasenrücken gerade und mit der Verlängerungslinie der Stirn nahezu gleichlaufend. **Gebiss** sehr kräftig, scherenartig scharf übereinandergreifend, nicht überbeissend.

Die **Ohren** sind mittelgross, am Grunde breit, hoch angesetzt; sie werden stehend getragen und sind, in scharfer Spitze auslaufend, nach



Stockhaariger deutscher Schäferhund, Rüde.

vorn gestellt. Eine dem Colliohr ähnliche Ohrenhaltung — Kippohr — findet sich gelegentlich, doch ist das Stehohr stets vorzuziehen. Das Heranzüchten durchweg stehohriger Hunde bleibt erwünscht, wenn auch für den Gebrauchshund bei der Herde die Ohrenhaltung durchaus nebensächlich ist; gestutzte Ohren und hängende Ohren sind zu verwerfen. Die Welpen deutscher Schäferhunde lassen, meist bis zum 4., 6. Monat, teilweise noch länger, die Ohren hängen.

Die **Augen** sind mittelgross, mandelförmig, etwas schrägliegend und nicht vortretend; möglichst dunkel von Farbe. Das Auge zeigt lebhaften und verständigen, Fremden gegenüber misstrauischen Ausdruck.

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**3. Hals:** Kräftig, mit gut entwickelten Muskeln, mittellang, ohne lose Kehlhaut oder Wamme. In der Erregung hoch aufgerichtet, sonst gerade getragen.

**4. Rumpf:** Brust tief, aber nicht zu breit. Rippen flach, Bauch mässig aufgezo-gen. Rücken gerade und kräftig entwickelt. Die Rumpflänge soll das Mass der Schulterhöhe übertreffen. Kurzurückige, hochläufige Hunde sind zu verwerfen. Der Schäferhund soll kein wüster Hetzer sein; die zum Herdendienst erforderliche Wendigkeit wird durch



gute Winkelung der Hinterhand erreicht. **Lenden** breit und kräftig, **Kruppe** lang und leicht abfallend.

**5. Rute:** Buschig behaart; sie reicht bis zum Sprunggelenk und bildet am Ende häufig einen seitlich gebogenen Haken. In der Ruhe in sanftem Bogen herabhängend getragen, wird sie in der Erregung und Bewegung stärker gebogen und gehoben, doch soll die Hebung nicht über die Senkrechte hinausgehen. Die Rute darf daher auch nicht gerade oder geringelt über den Rücken gelegt werden. Natür-

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liche Stummelschwänze kommen vor, sollten zur Nachzucht aber keine Verwendung finden. Künstlich gestutzte Ruten sind zu verwerfen.

**6. Vordergliedmassen:** Schultern lang und schräg gestellt, flach anliegend, gut bemuskelt. **Unterarm**, von allen Seiten gesehen gerade.

**7. Hintergliedmassen:** Keulen breit mit kräftigen Muskeln. **Oberschenkel** ziemlich lang und von der Seite gesehen schräg zum Unterschenkel stehend. **Sprunggelenk** kräftig.



Stockhaarige deutsche Schäferhündin.

**8. Pfoten:** Rundlich, kurz, gut geschlossen und gewölbt. **Sohlen** sehr hart. **Nägel** kurz und kräftig, zumeist von dunkler Farbe. **Wolfsklauen** finden sich, selbst als „Doppelsporen“, an den Hinterläufen häufig. Sie sind weder fehlerhaft, noch gehören sie zu den zu fordernden Rassezeichen. Da sie häufig gespreizten Gang verursachen oder Verletzungen der Läufe herbeiführen, empfiehlt es sich, sie bald nach der Geburt zu entfernen.

**9. Farbe:** Schwarz, eisengrau, aschgrau, rotgelb, rotbraun, entweder einfarbig oder mit regelmässigen rostbraunen bis weissgrauen



Abzeichen. Ferner rein weiss, oder weiss mit dunklen Platten gemischt (Blau-, Rotschimmel usw.), sowie dunkelgewolkt (schwarze Färbung auf grauem, gelbem oder lichtbraunem Grunde) mit den entsprechenden helleren Abzeichen, die sogen. Wolfsfärbung. Weisse Abzeichen an Brust und Läufen erlaubt.

Das Grundhaar ist, ausser bei schwarzen Hunden, immer licht gefärbt. Die endgültige Färbung der Welpen ist erst nach Durchbruch des Deckhaars bestimmbar.

10. **Behaarung:** Lediglich nach der Behaarung werden nachstehende 3 Arten deutscher Schäferhunde unterschieden:



Langstockhaariger deutscher Schäferhund.

- a) der stockhaarige deutsche Schäferhund.
- b) der rauh- oder drahthaarige deutsche Schäferhund.
- c) der zotthaarige deutsche Schäferhund

Allen drei Arten ist ein dichtes, enggeschlossenes Grundhaar (Unterwolle) eigentümlich; diesem verdankt der Schäferhund seine Wetterfestigkeit.

a) **Der stockhaarige deutsche Schäferhund.**

Deckhaar möglichst dick. Das einzelne Haar gerade, harsch und fest anliegend. Kopf, einschliesslich des Ohrinnern, Vorderseite der

Läufe, Pfoten und Zehen kurz, Hals länger und stärker behaart. An der Rückseite der Vorder- und Hinterläufe verlängert sich das Haar bis zur Vorderfusswurzel oder bis zum Sprunggelenk, bildet an den Keulen mässige Hosen. Die Länge des Haars ist verschieden; auch finden sich infolge der verschiedenen Haarlängen reichlich Zwischenformen. Zu kurze Behaarung ist fehlerhaft, zu lange (Langstockhaar) wirkt als Schmutzfänger und entbehrt bei weicher Beschaffenheit nicht selten der Unterwolle.



Rauhhaariger deutscher Schäferhund.

b) **Der rauh- oder drahthaarige deutsche Schäferhund.**

Diese Art findet sich nur sehr selten, zumeist auch nicht in wünschenswerter Reinheit. Im allgemeinen ist die Behaarung kürzer als beim stockhaarigen Hunde. Die dort kurz behaarten Teile, also Kopf und Läufe, sind beim rauhhaarigen Hunde aber mit, wenn auch etwas kürzerem, Drahthaar besetzt. Solches Haar bildet auch an den Lippen und über den Augen mehr oder minder stark entwickelten Bart und Augenbrauen. Das einzelne Haar soll sehr straff, hart und drahtig anzufühlen sein wie beim rauhhaarigen deutschen Pinscher; die Rute



Zotthaariger deutscher Schäferhund, Süddeutschland.  
(sogen. altdeutscher Schäferhund).



Zotthaariger deutscher Schäferhund,  
Hannover, Braunschweig.

ohne Fahne. Im übrigen entspricht der rauhhaarige Hund im Bau durchaus dem stockhaarigen; doch erscheint der Fang etwas breiter und kräftiger.

c) **Der zotthaarige deutsche Schäferhund.**

Auch diese Form ist nicht mehr häufig, doch in Süddeutschland als Gebrauchshund noch beliebt. In der Regel aber als Kreuzung zwischen zott- und stockhaarigen Hunden, seltener der reinen Form des sogen. „altdeutschen“ Schäferhundes entsprechend. Sie hat dichtes, langgewelltes, rauh anzufühendes Haar. Das Kopfhaar fällt, die Augen teilweise überdeckend, nach den Seiten ab und bildet einen die Schnauze bekleidenden Lippen- und Knebelbart. Die Pfoten sind hier gleichfalls lang behaart; die Rute trägt eine Fahne. Die Ohren sind in Süddeutschland zumeist mittellange Hängeohren. In Norddeutschland, besonders in Hannover und im Braunschweigischen, finden sich vereinzelt auch zotthaarige Hunde mit Stehohren; diese meist von reinweisser Farbe.

11. **Fehlerhaft:** Alle den Gebrauch und die Ausdauer beeinflussenden Gebüdemängel. Insbesondere: hochläufige, kurzrückige Gesamterscheinung; zu leichter oder zu plumper Bau; weicher Rücken; steile Stellung der Gliedmassen, sowie alle die Schrittweite, Leichtigkeit und Ausdauer des Gangwerks beeinträchtigenden Punkte. Ferner zu weiche oder zu kurze Behaarung und fehlendes Grundhaar. Plumper oder der Tiefe entbehrender Schädelbau. Zu kurzer, stumpfer oder zu schwacher, spitzer Fang, sowie stärkeres Vor- oder Ueberbeissen. Gespreizte und — ausser bei Zotthaarigen — zu lang behaarte Pfoten. Hängende — ausser bei zotthaarigen Altdeutschen — und dauernd schlecht getragene Ohren. Gerollte, geringelte, wie überhaupt schlecht gehaltene Rute. Gestutzte Ohren und Ruten.

## BREED STANDARD AMENDMENTS

The SV breed standard of 1899 has been amended on nine occasions with the most significant amendments relating to coat, height, colour, ears, character and listed faults - particularly teeth faults.

The breed standard was first amended at the 23rd general meeting of the SV held in Cologne on the 17 September 1909, then again at a meeting in Wiesbaden on 5 September 1930 and 25 March 1961. Within the World Union of German Shepherd Dog Clubs (WUSV) framework, it was revised and confirmed at the WUSV meeting on 30 August 1976 and reviewed, catalogued by authorisation and resolution of the Executive and Advisory Committee on 23 March 1991. Further amendments were made at the Federation's meeting on the 25 May 1997, the 31 May 2001, 1 June 2001 and 6 and 7 June 2009. The latter included an amendment to allow long stock hair - effective 2010.

On the principle of 'country of origin', the 1976 version No.166 was approved by the FCI and, in turn, accepted as the breed standard by all FCI affiliates with its standardised FCI format. Following is the current FCI/SV standard, and for anyone looking at the standard for the first time or seeking a form of explanation, the author's comments are below each section.

### CURRENT SV BREED STANDARD (2010)

**General appearance** *The German Shepherd Dog is medium-size, slightly elongated, powerful and well-muscled, with dry bone and firm overall structure.*

**Important dimensional ratios** *The height at the withers amounts to 60 cm to 65 cm for male dogs and 55 cm to 60 cm for female dogs with a + 1mm variance allowed. The trunk length exceeds the dimension at the height at the withers by about 10% - 17%.*

**Character** *The German Shepherd Dog must be well balanced (with strong nerves) in terms of character, self-assured, absolutely natural and (except for a stimulated situation) good-natured as well as attentive and willing to please. He*

*must possess instinctive behaviour, resilience, and self-assurance in order to be suitable as a companion, guard, protection, service and herding dog.*

**Head** *The head is wedge-shaped, and in proportion to the body size (length about 40% of the height at the withers), without being plump or too elongated, dry in the overall appearance and moderately broad between the ears. Seen from the front and side, the forehead is only slightly arched and without any or with only a slightly indicated middle furrow.*

*The ratio from the cranial region to the facial region is 50% to 50%. The width of the cranial region more or less corresponds to the length of the cranial region. The cranial region (seen from above) tapers evenly towards the nasal bridge with gradually sloping, not sharply depicted stop in the wedge-shaped facial region (foreface) of the head. Upper and lower jaws are powerfully developed.*

*The nasal dorsum is straight, any dip or bulge is undesirable. The lips are taut, close well and are of dark colouring.*

**Nose** *The nose must be black.*

**Teeth** *Teeth must be strong, healthy, and complete (42 teeth according to the dental formula). The German Shepherd Dog has a scissor bite, i.e., the incisors must interlock like scissors, whereby the incisors of the upper jaw overlap those of the lower jaw. Occlusal overlay, overbite and retrusive occlusion, as well as larger spaces between the teeth (gaps) are faulty. A straight dental ridge of the incisors is also faulty. The jaw bones must be strongly developed so that the teeth can be deeply embedded in the dental ridge.*

**Eyes** *The eyes are of medium size, almond-shaped, slightly slanted and not protruding. The colour of the eyes should be as dark as possible. Light, piercing eyes are undesirable since they impair the dog's impression.*





stop, gives the illusion of the eyes being deep-set and placed further apart than the normal coats. There is an impression of a rounded head and flaring of hair away from the cheeks, broad muzzle, softish hair texture, long hair to the back of the head and sometimes a slight wave. Longer hair along the back of the front legs and rear pasterns, around the base of the ears and between the toes confirm the coat variety.

The above is a guide. The degree of long hair and associated characteristics varies and depends on the age of the puppy at assessment. Sometimes it can be easier to ascertain a long coated puppy at two weeks than at five weeks, and some can be diagnosed as a long hair, when in fact they are not. A badge worn with pride akin to a water diviner is when an individual professes to have a 100% identification strike rate.

In point form, and relative to age and the degree of hair length, the indicators of long hair in a puppy are as follows:

- Softish feel and texture to the coat sometimes a silky-smooth feel
- Muzzle looks wider, somewhat truncated
- Thick hair or soft woolly fluffiness to the external and internal base of the ears

- Hair is more profuse and when dry, standoffish to the skull giving a roundish skull shape. In some puppies, this hair has a swept back appearance
- Hair to the neck region is longer sometimes a little wavy or with a ripple
- The impression of the head is 'Schnauzer like'
- Hair is sleek, shiny, and looks darker in colour
- Hair to the inner part of the eye flicks toward the eye not away from it
- The outer region of the eyes has a slightly roundish owl-like look
- Longish feathering to the back of the forelegs sometimes with a wrap-around effect
- Long hair between the toes that give the impression of big paws
- Some reports say long haired puppies tend to be calmer, quieter than their normal coated litter-mates and have stronger appetites

Some long coats can become less so as they get older and for other than some tufts of hair around their ears and a full tail, their coat looks normal. **These dogs are normally 90% normal coat, and whilst arguably more stock coat than long coat, are exhibited as long stock coat.**



*Ten week old long coat*



*Twelve week old long coat*



The SV decision to incorporate long hair into the breed standard was associated with the rule there should be no interbreeding between varieties. The primary argument for this was a genetic one; if interbreeding was allowed, long coats would eventually become dominant, long coats would endanger the normal coat's very survival! I disagree with that opinion and make the following comment. In countries where German Shepherd Dog populations are low and inter-variety breeding is prohibited, anecdotal comment suggests the outer coat will eventually become less harsh, less coarse, less dense. Another anecdotal comment suggests stock coat dogs that carry the long stock hair gene possess a thicker, denser coat than those who do not carry the gene.

Long hair that lacks sufficient coarseness and density tends to break open slightly when it is wet, and therefore, a good layer of dense undercoat becomes all the more vital. This leads to a comment that gets little to no airplay. Captain von Stephanitz was just as concerned with hair that was too short as he was about hair that was too long. His opinion on both issues was the same, *'undesirable for breeding with undercoat - not suitable for breeding without undercoat'*.

With reference to the earlier remarks by Captain von Stephanitz in regard to lack of undercoat in long stock hair animals, it is not uncommon to hear and read in magazines that LSH often have no undercoat. However, it needs to be kept in mind that he was talking about 'inherent undercoat from very specific lines'; lines that had gene-linked skeletal / hair characteristics.



Side profile Female LSH and Male LSH

One obviously accepts what Captain von Stephanitz said about gene linked outer-coat/undercoat being the case in the 1900s, however, there was also far greater diversity in herding dog type, families, blood pool and coat type than there is today. Today, the number of German Shepherd Dogs stock hair or long stock hair that do not inherently possess undercoat would be minuscule.

The person who first decided that German Shepherd Dogs with long coat but no undercoat were 'unsuitable for breeding' and dogs with a long coat with undercoat were 'less suitable for breeding' was Captain von Stephanitz. Any judgement of coats, therefore, should be made with an understanding of his reasoning.

With the implementation of the Breed Survey Scheme in Germany in 1922, Captain von Stephanitz removed rough-coated and shaggy coated German Shepherd Dogs from the breeding pool. However, 'long coats with undercoat' were allowed to be breed surveyed and exhibited right up until the sixties, with the highest grading being 'good' and the highest breed survey classification of Class II. I could not find the official date when the SV brought this to an end and introduced the new rule disallowing long coats from being exhibited and breed surveyed. As surveys and breeding are officially linked in Germany, the SV effectively changed the status of *long coat with undercoat* from *'less suitable for breeding'* to *'unacceptable for breeding'*.

To the surprise of many people throughout the world, and no doubt within Germany, the SV amended the breed standard, effective 23 December 2010, reversing the 40 odd year old rule. Allowing 'long coats with undercoat' to be exhibited and breed surveyed commencing with the SV 2011 breed survey year but with long coats kept at arm's length from 'normal coats' by prohibiting the breeding of normal coat to a long coat.

Why the SV decided to allow long coats (which was automatically endorsed by the VDH and then the FCI and its affiliates) is open to some conjecture. Most likely it was to incorporate a very substantial number of dogs onto the SV register thereby boosting its rapidly declining membership.

So, notwithstanding the standard's details, what are the differences between the two coat varieties?

- **Mouth** Check for any sores, infected gums, cuts or swellings. The breath should smell fresh. Check the teeth for tartar and damage. During the first year, teeth do not usually require cleaning but after that, brush teeth regularly. Use a moistened dog toothbrush with soft bristles. If you do not have a specially designed pet toothbrush, you can also use a child's toothbrush, a finger toothbrush, dental wipes, gauze around a finger or a cotton swab. Pet toothpaste, often flavoured like poultry, malt and other dog-friendly varieties is the best option. Never use human toothpaste, baking soda or salt. While safe for you, these cleaning agents can be harmful to your dog if swallowed. It's crucial to get your dog used to their teeth being examined/handled right from the beginning, from puppyhood, and as stated earlier, the best way to do this is when you are grooming. The best way to ensure your dog's oral health is to have him undergo a professional veterinarian clean once a year.
- **Eyes** Make sure the eyes are clear and bright with no discharge. They should never be fiery red or angry looking. There should not be persistent tears or discharge. If this is the case, bathe the eyes with warm water and boric acid or use Murine drops. If you are concerned, consult your vet.
- **Ears** There should not be any strong odour. Check for redness or discharge and fly bites on their tips. Check the ears for wax build-up and dirt and if required use an ear cleaning solution.
- **Nose** Look for thick or coloured discharge. The nose should be cold and may be dry or wet; either is fine. If the **nose** is dry, rub a little Vaseline on it.
- **Skin** Look for parasites, ticks, fleas and check that there are no bumps, crusts, red spots or hair loss.
- **Feet** Look for cuts, split nails, sore pads and look at the nails' length; they should not touch the ground but raised above it.
- **Anal** Lift the tail. There should be no discharge, swellings, sores or redness. This is a good time to check for signs of intestinal worms as most are identified by the presence of their eggs in the dog's faeces. These eggs are very small, and many

are difficult to identify by eye, however tapeworms and roundworms are two that you can see with your eye. Tapeworms look like small pieces of rice and can be found around the tail and anus area, sometimes clinging to the hair in the anus region. Roundworms are long white worms that look like noodles or spaghetti.

### SHEDDING RAKES

Shedding rakes remove loose hair from the dog's undercoat. Use one in the same manner you would use the other grooming tools, following the direction of the hair and the contours of the body. You can also use the shedding rake on the dog's back and hindquarters.

### WASHING

Putting aside that special dog show, normal, healthy dogs should only require a bath four or five times a year. The frequency is obviously affected by the dog's environment, hair length, physical activities and skin condition. Too much bathing, especially with shampoo containing high levels of soap and detergent removes too many natural oils from the coat. Put a non-slip rubber mat in the tub, and use a hand-held hose attachment with warm water, testing with the back of your hand to ensure the temperature is not too high. Wet your dog's coat thoroughly, and then apply the shampoo, working from the back of the head and neck downwards. Let the dog sit for a few minutes before rinsing as this helps loosen the undercoat, then rinse thoroughly leaving no trace of shampoo in the coat.

### SHAMPOO

Check for a shampoo that matches pH 7.5. Most human shampoos will irritate the dog's skin and cause scaling so avoid the temptation of using human shampoos. Choose an anti-seborrheic shampoo for scaly, oily skin, a moisturising shampoo for scaly, dry skin, oatmeal-based anti-pruritic for itchy skin and anti-microbial shampoo for infected skin. When washing, rinse in sections. Use a wet cloth to wash the dog's face to avoid getting shampoo and water in its eyes, nose, and



We are all very familiar with the cliché 'nothing beats seeing the dog in the flesh', but there is a better one, especially for novices, and that is, 'nothing beats seeing the dog in the flesh, if you know what you are looking at'. Notwithstanding this point, not everyone is fortunate enough to travel overseas and see important dogs in the flesh, so aside from video, which has its limitations, photographs are the only substitute for them. What is also important for the German Shepherd Dog breed is that photographs, far more than film or video, are the dominant historical, visual record.

Without photos there are no visual records, only words, and if you are cynical about photos, try words, try critiques! The bottom line is that photography has in the past and will in the future, be the most valuable and tangible source of the breed's history and development. The fact that some organisations have failed in their responsibility by not monitoring and policing images to ensure their bonafides is a sad indictment of them, their ideals, their sense of responsibility to the breed and the sport of showing dogs. In the years ahead, when historians reflect on the breed's history, this indictment will be realised.

Today, most people who take photographs of dogs at shows, posting them on Facebook or in dog magazines, are not professionals. Notwithstanding this fact, some consider themselves professionals simply because they can afford to buy a good camera and telephoto lens. They are not professionals, either technically or artistically, and have no understanding of what is required to obtain the very best photo image of a dog - they are amateurs. Most of their photos are taken at a time when the dogs have just finished extensive running and gaiting around the ring, often awake since dawn travelling to the show and very often tired and fed up, especially if it is a hot day. The handlers are also tired and totally disinterested in standing the dog for a photo that may never see the light of day other than perhaps being shown to friends on a Friday night.

So, the class has finished and there is the dog with its tongue lolling around, maybe foam in its mouth, its torso hanging between its shoulder blades and the 'weekend photographers' start crowding around and shouting, 'we want a photo, stand your dog!' Photographers at the Sieger Shows are often jostling between themselves to get a good position because

of their limited confinement, yelling instructions to the handler who for obvious reasons is far more intent on focusing on the judge. Amid the mayhem of instructions being shouted demanding 'get the tongue forward', 'fix the tail', 'fix the front legs', 'fix the back legs', 'get his ears up', many photos are taken and some published, and even if the photographer is very skilled, the dog looks as one would expect – unremarkable!



Professional photographer Olga Vartanyan with Jenny Petrushina...

straight on, perhaps only one ear showing, is not quite as effective. An impossible impression is given to the onlooker when the head is turned to the other side and with the mouth closed. Not so effective is a tongue that is hanging out too far or to the side covering the teeth. You have also to watch that the dog is not just at the moment of taking the photo closing his eyes because of glaring sunshine.

Look at the topline. In photos we often see that the dog has a curved back, it may be that the dog is pushing his back upwards, the cause could be artificial positioning, some dogs are doing it when you stroke your hand over their back, so you must be careful!

The position of the backhand needs special mention. Not just to over-stretching but also the opposite. That is, it is possible that the hind legs are standing too short in their stance and then the dog gives the appearance of being boxy, 'pushed together'. A normal stance means that the metatarsus of a correctly angulated dog should stand approximately perpendicular. The leg on the other side should be moderately pushed under, but angulation should never reach such a degree that the rear pastern is nearly lying flat to the ground. The tail must hang loosely between the hind legs, neither tucked in nor stretched out as horizontal flag.

### Summation

The overall impression is most important! Our German Shepherd Dog is a living being and therefore the ideal pose position can't be frozen indefinitely. You must be as quick as a flash to recognise the instant the right pose has been achieved and open the shutter of your camera at the same time. If your subject should stay in that position for a couple of seconds and you are fortunate enough to shoot several pictures one after the other, you will find in those proofs that each photo varies from the other in some respect.

Finally, there is some advice and consolation. The perfect dog does not exist nor will the perfect dog photo. All you can do is try to embody as many of the above-mentioned

points as possible when taking the photo. How far you may be crowned with success is a matter of a combination of lots and lots of practice, patience and experience.' [Hans Leinhas, (1976)]

### A few basic photographic tips to remember:

- Patience - you, the handler and the attractor
- Ensure the dog is well exercised and settled
- Use a good camera and lens
- Tell the handler exactly where you want the dog to stand and how it is to be stood
- Get down to about the dog's head height
- Position yourself square on with the dog
- Make sure the sun is behind you
- Don't shoot when the sun is highest and brightest
- Be aware of shadows and where they fall around the dog
- Be aware of the background and area around the dog's feet
- Focus on the dog's eye/s
- Use wide aperture to achieve a shallow depth of field
- Keep your ISO as low as possible
- Use fast shutter speed
- A light chain collar is better for the neckline
- Don't bother taking a shot if the dog is not standing perfectly – make this assessment standing upright using both eyes, not bent over with one eye looking through the camera lens
- Check that the tongue is forward, the head turned slightly toward you and tail placed right, the topline is smooth and not bunched around the collar or wither
- Tell the handler to step back from the dog once it is stood with lead raised
- Now take the shot!



A great photo of Nikita des Collines du Boischant



to the dog a man is a significant large predator and survival would dictate that reckless behaviour and needless confrontation with such a serious rival should be avoided unless it is a necessity. In the wild, injury can mean death and hundreds of thousands of years of genetic learning in the dog have instilled into him that injury should only be risked if the defence of the social group is required over territorial or breeding rights or the acquisition of food. The job of the helper is to teach the dog otherwise, that a man can be ultimately overcome, and the prize (the sleeve) can be won without risk or harm. This is the dog's deeply inherent desire, and when achieved, it represents enormous satisfaction and a deep sense of pride for the dog.

### HANDLING AND INTERACTION WITH YOUR DOG



*Sean O'Kayne and Dexter vom Eisernen Kreuz with wife Christine and son Connor*

Dogs learn from watching and studying human behaviour. This has been essential to their survival and wellbeing over thousands of years and as a consequence dogs are incredibly sensitive to our movement, moods, body language, expressions and voice. Therefore, it is critically important that we adopt a consistent, positive, empathetic and calm approach when engaging with them.

Impulsive, emotion-driven actions and behaviour have no place in training dogs and can only lead to stress

and lack of trust in dog/handler teams. As most of us are often governed by our emotions, this approach can be difficult and takes time to master, but master it you must to achieve your aims in Dogsport. In this regard, an additional dimension that very often comes into play is the stress generated by merely being under the spotlight of competing in an IGP trial. Handlers, especially those with an anxious or perfectionistic disposition, must learn to manage such stress, and not let it impact on the harmony between themselves and their dog.

Enjoy your journey participating with your German Shepherd Dog in one of the world's most enjoyable, satisfying and rewarding sports - Internationale Gebrauchshundprüfung (IGP).



*Adriana Nagyová and Gero z Berounské basty  
WUSV Universal IGP Sieger 2021*

# Nutrition

## THE DIGESTIVE SYSTEM AND PROCESSES

### Food mastication and ingestion

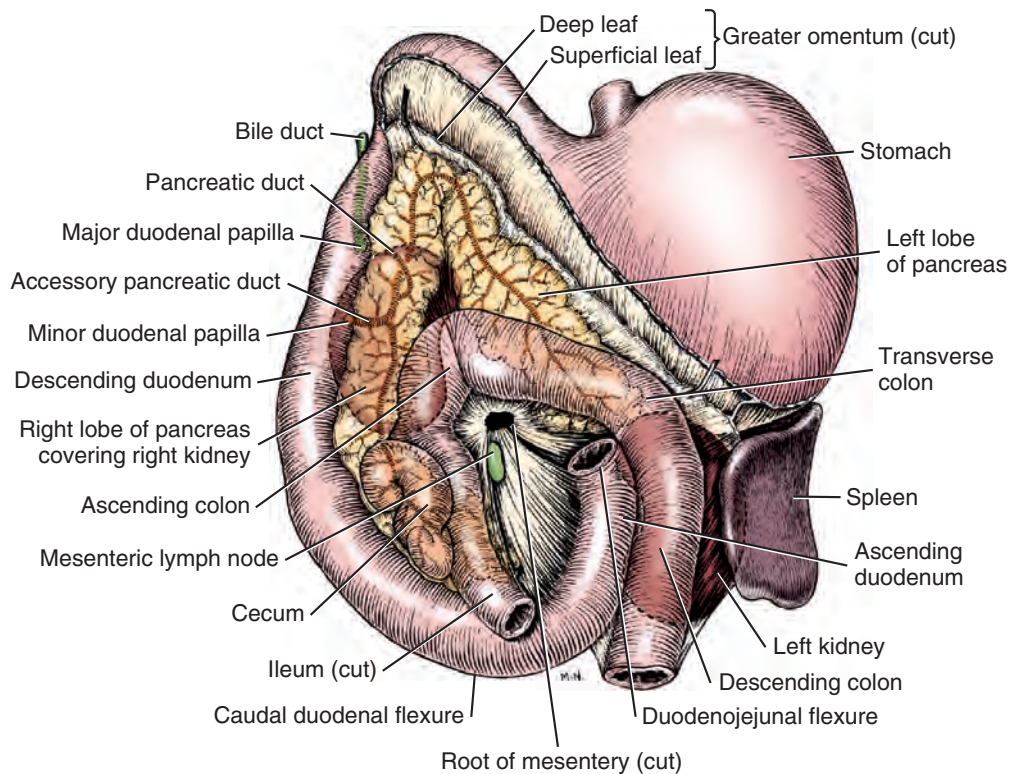
Humans can chew up and down and side to side, whereas dogs can only chew up and down, impacting the size of the food being digested. Humans chew food until it is quite masticated and starts to be broken down with amylase, a digestive enzyme, before being swallowed. In contrast, dogs don't masticate their food, have no amylase, gulp the food down quickly, often in very large pieces, and the digestive process starts in the stomach.

This very fast gulping down of food is a survival instinct inherited from their ancestors, the wolves (eat it before other predators come along and take it away from you), and is facilitated by lots of saliva, which lubricates the mouth, oesophagus and stomach and the reason dogs exude a lot of saliva, drool, especially when food is involved and sometimes slobber.

A dog's stomach contains hydrochloric acid ten times stronger in concentration than in humans. This is because the strong hydrochloric acid kills bacteria and digests animal proteins, bones and fats.

*In humans, food moves from the stomach into the intestines after about thirty minutes, but it can take anywhere from 10 to 16 hours in dogs. [Zietzschmann, (1938)].*

It is much slower in dogs because the food can be held in the stomach as a storage facility releasing energy as it is required. When the dog needs more energy, the food is shunted from the stomach into the intestine on an 'as needs basis'. This is also inherited from wolves, where in the wild, they may have to go for very long periods without food, sometimes several days!



*The abdominal viscera - ventral aspect Image: Elsevier*



## The Digestive System

Food contains stored chemical energy; when the dog eats, its digestive system breaks the food down into proteins, fats, carbohydrates, minerals, and vitamins and absorbs them for fuel.

Wavelike contractions move the food from the dog's mouth down the neck, through the chest and into the stomach via the oesophagus - see page 923. The oesophagus has a tight sphincter muscle where it meets the stomach. Located at the top of the stomach, it acts as a door and prevents acid reflux or the movement of acid from the stomach back up into the oesophagus.

### The abdomen

The abdomen contains the stomach, small intestine, colon and liver.

### Stomach

It is often called the belly from the old English word 'bag'.

### Stomach function in digestion

*'The stomach has three basic functions that assist in the early stages of digestion and prepare the food for further processing in the small intestine, where it turns into 'chyme'. First, it serves as a short-term storage area, allowing the dog to quickly consume a large meal and process it over a longer period. Second, substantial chemical and enzymatic digestion begins in the stomach, particularly proteins. Third, the stomach's contractions mix and grind food with secretions, liquifying or blending the food, a necessary step before the food is delivered to the small intestine.'* [Spielman, (2015)].

### Small intestine

The small intestine is creased and folded with projections called villi, increasing the available surface area to absorb almost all nutrients into the blood and extends from the stomach to the junction of the small and large intestines.

*'The small intestine consists of the duodenum, the jejunum and the ileum.*

*The duodenum is the first and most stationary part of the small intestine. Within the duodenum, openings are present that allow digestive juices to enter the intestines from the pancreas and gallbladder.*

*The jejunum is the longest part of the small intestine and is free to move into whatever unoccupied space is available within the abdomen and where food, after being turned into a nutrient-rich mush, is finally absorbed by the body.*

*The ileum is the short, terminal portion of the small intestine. The interior lining has numerous microscopic, finger-like projections called villi. These villi stick out towards the centre of the intestine and greatly increase the surface area available for digestion and absorption.'* [Spielman, (2015)].

### Large intestine

The large intestine is wider and shorter than the small intestine, consisting of the cecum, colon, anal canal, and rectum and participates in the last phase of digestion and has three important functions. It recovers the last available water and electrolytes from the food, forms and stores faeces, and works with bacteria to produce enzymes capable of breaking down difficult-to-digest material.

The cecum is a small dead-end pouch that lies near the junction of the small and large intestines. The colon begins in the lower portion of the right side of the abdomen with the last portion leading into the rectum and then the anus.

### Liver

The liver is the largest gland in the dog's body, and whilst its main job is to filter blood coming from the digestive tract before passing it to the rest of the body, it also assists in digestion. It does this by producing bile which is stored in the gallbladder. Bile, a yellow-green fluid, when released into the duodenum, helps with digestion by breaking down fats (emulsifying) into fatty acids.

## VETERINARY TERMS, MEANINGS AND SYMPTOMS

### A

**Abdomen** The belly, that part of the dog's body containing all of the structures between the chest and the pelvis. The abdomen is separated anatomically from the chest by the diaphragm, the powerful muscle spanning the body cavity below the lungs.

**Aberrant cilia** Eyelashes growing abnormally, such as rubbing against the eyeball. Symptoms are reddening of the eye, eyelid, or inside of the lid; sometimes with swelling, trouble closing the eye(s) excessive tearing, squinting, pawing at the eye.

**Abscess** A localised collection of pus in tissues, organs, or confined spaces usually because of an infection.

**Achondroplasia** Abnormal development of cartilage leading to dwarfism.

**Acral lick dermatitis** A skin disease caused by the dog licking a localised area excessively, especially on the legs and paws. This creates a raised, ulcerative, or thickened plaque usually located on the back side of the ankle, or between the toes.

**Acute** A rapid and often severe onset.

**Acute moist dermatitis** Known as 'hot spots,' a localised area of a severely itchy, inflamed and oozing dermatitis exacerbated by the animal's intense licking and chewing at the spot.

**Addison's Disease** Also known as primary adrenal insufficiency and hypocortisolism. It is a long-term endocrine disorder in which the adrenal glands do not produce enough steroid hormones. Symptoms generally come on slowly and may include abdominal pain, weakness, and weight loss.

**Adrenergic** Communication between the nerves and muscles that uses epinephrine as the 'messenger.' Adrenergic stimulation is involved in the 'flight or fight' response, which means the body is alerted to a danger of some sort and prepares to run away or fight. Adrenergic stimulation results in an increased heart rate, sweating, and increased blood pressure.

**Albumin** A protein in the blood responsible for the maintenance of osmotic (water) pressure in the blood; also binds to large molecules in the blood and serves to transport them; produced by the liver; also called 'serum albumin'.

**Allergen** If the dog has an allergy, the immune system identifies allergen as an invader. The immune system responds by releasing chemicals that cause symptoms

in the nose, throat, eyes, ears, skin or roof of the mouth. Common allergens include dust mites, animal dander, mould, medications, insect venoms and various foods. In non-allergic animals, these substances cause no immune response.

**Alopecia** A loss of hair from the dog's body. Some animals may be genetically predisposed, while in other animals it may be caused by hypersensitivity or nutritional factors.

**Anabolicsteroid** Also known more properly as anabolic-androgenic steroids (AAS), are steroidal androgens that include natural androgens like testosterone as well as synthetic androgens that are structurally related and have similar effects to testosterone.

**Anaemia** The condition of having a lower-than-normal number of red blood cells or quantity of haemoglobin. Anaemia diminishes the capacity of the blood to carry oxygen. Dogs with anaemia will be tired, have pale skin inside the mouth, fatigue easily, develop palpitations and become short of breath.

**Anaesthesia** The total loss of feeling or sensation. It is induced with drugs to allow surgery or procedures to be performed without causing pain. May be applied to the whole body, known as general anaesthesia, or part of the body known as local anaesthesia.

**Anal furunculosis** See Perianal fistula.

**Anal glands** Anal glands, or anal sacs as they are sometimes called are small paired pouches located between the internal and external anal sphincter muscles, one on each side of the anus. Liquid with scent held inside the sac is usually expelled when a dog defecates, but if this does not occur regularly, the material inside thickens, making it harder to pass. If this situation persists, the gland may become impacted, inflamed and infected.

**Analgesia** Designed to relieve pain.

**Anaphylaxis** A rare, life-threatening, immediate allergic reaction to something ingested or injected. If untreated, it results in shock, respiratory and cardiac failure, and death. Anaphylaxis is the most severe form of allergic reaction and is potentially life-threatening. It must be treated as a medical emergency, requiring immediate treatment and urgent medical attention.

**Anisocoria** A condition in which the pupils of the eyes are not of equal size.

**Anorexia** Loss of appetite, whatever the cause.

**Antagonist – muscle** Antagonist and agonist muscles often occur in pairs, called antagonistic pairs. As one muscle contracts, the other relaxes.



### History of the Problem

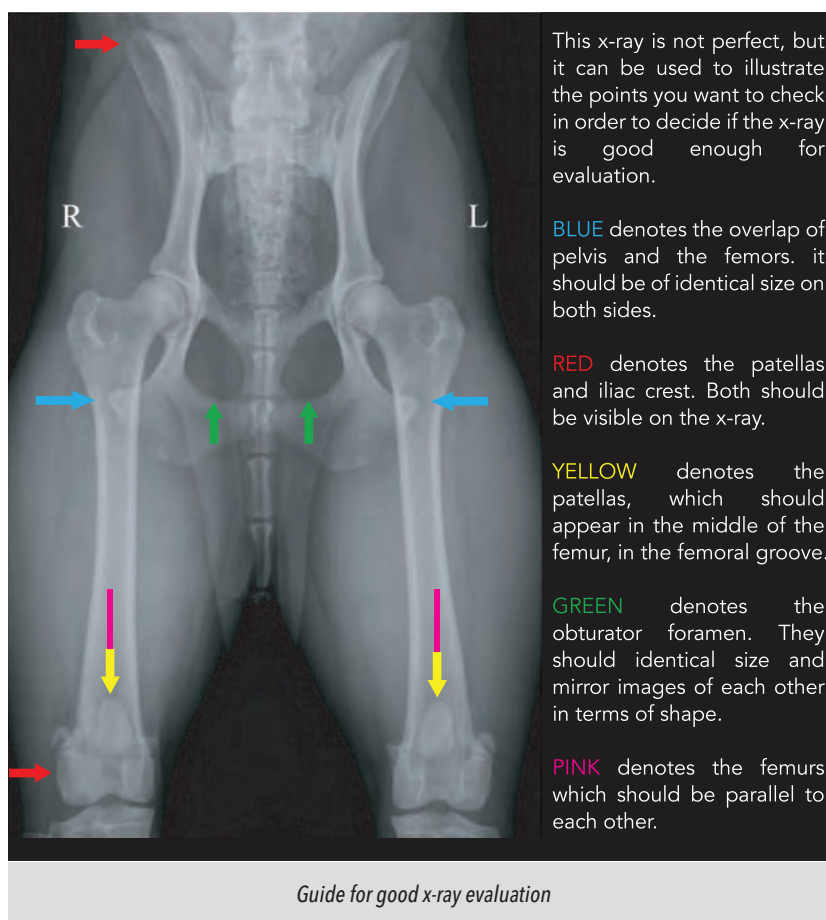
The condition was first discovered by an American veterinarian, Gerry Schnelle, working with his new X-ray machine in the late 1920s and early 1930s. He found that a number of the large breeds of dogs that visited the Angell Memorial Animal Hospital in Boston where he worked had defective hip joints. He published on the subject (Schnelle, 1935, 1937), but little publicity was given to the issue before the Second World War, and it was not until the war ended that attention reverted to the problem. Even then, it was largely the USA that seemed preoccupied with hip dysplasia.

Although not specific to the breed, it was German Shepherd Dog breeders who devoted most attention to hip dysplasia, and for a time, it was viewed as an American problem. According to the SV, it was unheard of in the fatherland, and it became known as the 'American disease. Even in Britain, there were those eager to look for alternative **explanations or argue** that it was not to be found in British dogs. Fortunately, Scandinavian workers looked at hip X-rays, and an early paper by Henricson and Olsson (1959) showed that Swedish dogs had similar problems to their American cousins.

Schemes to combat the problem were set up in 1958 in Sweden (Hedhammar, 1986) and followed in other Scandinavian countries. A scheme was established by the then Alsatian League and Club of Great Britain in 1961 but quickly terminated as it was based on vague diagnostic techniques. The British Veterinary Association (BVA) set up a scheme in 1965, and schemes were later set up in the USA by the Orthopedic Foundation for Animals (OFA) in 1967 and by the German SV in the same year. Most European countries now have hip schemes, and in many countries of the world, some attempt is being made to look at the problem.

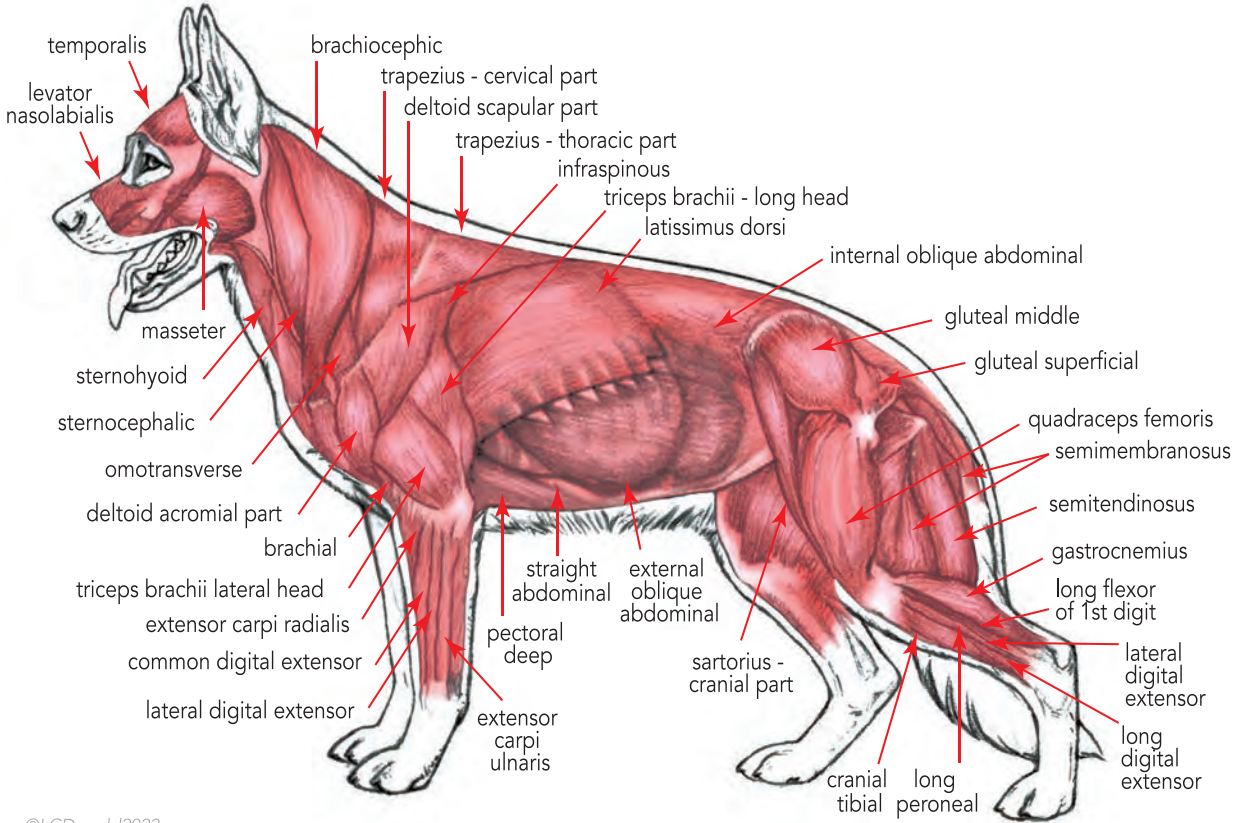
### Diagnosis - General

Diagnosis of hip dysplasia has generally been by radiographs which have then been read by trained

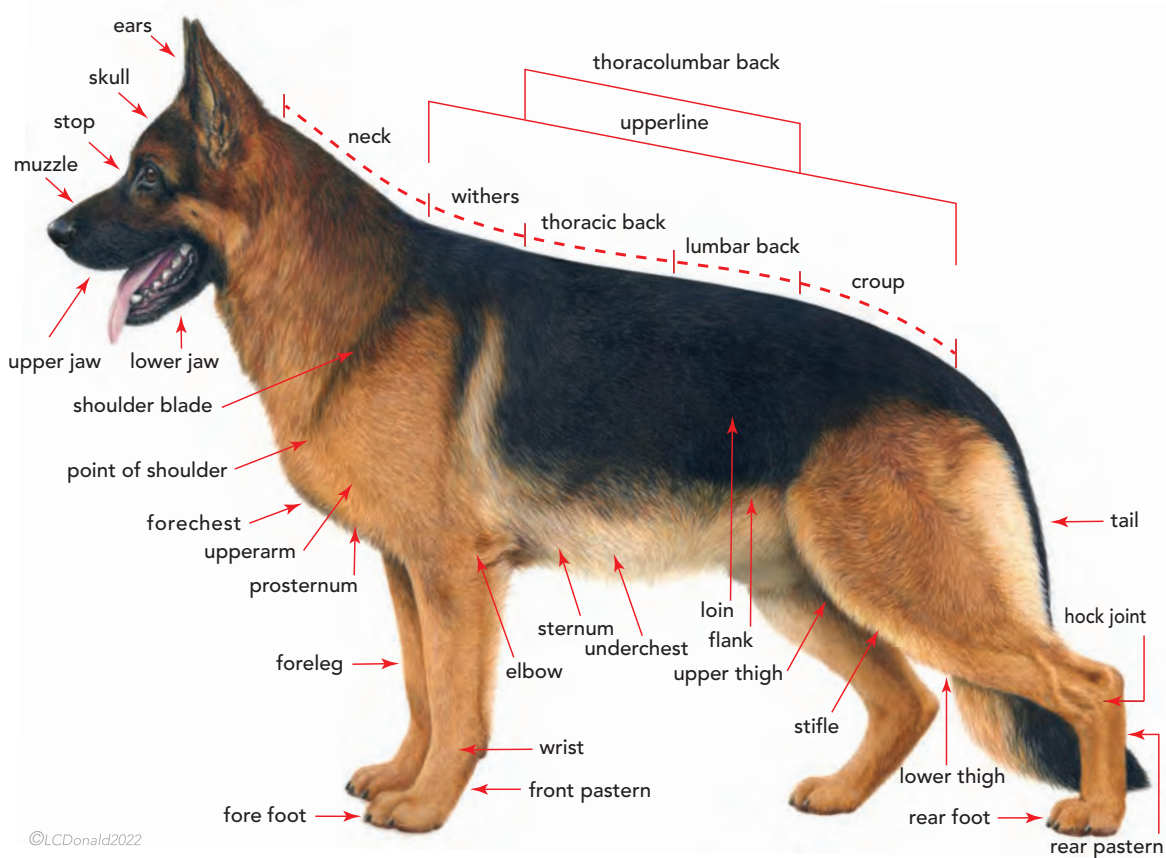


veterinarians, preferably those skilled in radiographic work. In a book on genetics, it is not possible to delve into too much detail on this aspect which, in any event, is going to be under the control of veterinarians rather than breeders. Essentially it is up to the veterinary practitioner to know what X-ray method is called for, and there are numerous publications dealing with this. The breeder should be able to visit his/her veterinarian and understand that professional skills will be applied to positioning the dog in the required way with, at the same time, the necessary items of information (registration/tattoo number/ date of X-ray/indication of right or left side etc.) being filmed onto the plate.

The method of radiographing the dog was described by Lawson (1963) and by Stunkard et al., (1969), the latter paper emphasising the importance of correct positioning. There is no doubt that in the very early days, incorrect positioning must have led to numerous false diagnoses and a considerable number of discards or culls that were not merited. Now there can be no excuse for any veterinarian not knowing how to position



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## GENERAL APPEARANCE - GERMAN SHEPHERD DOG TYPE

The first impression of the German Shepherd Dog should be of an alert and expressive, medium sized, well pigmented, slightly elongated, powerful, well-muscled dog with tight ligaments.

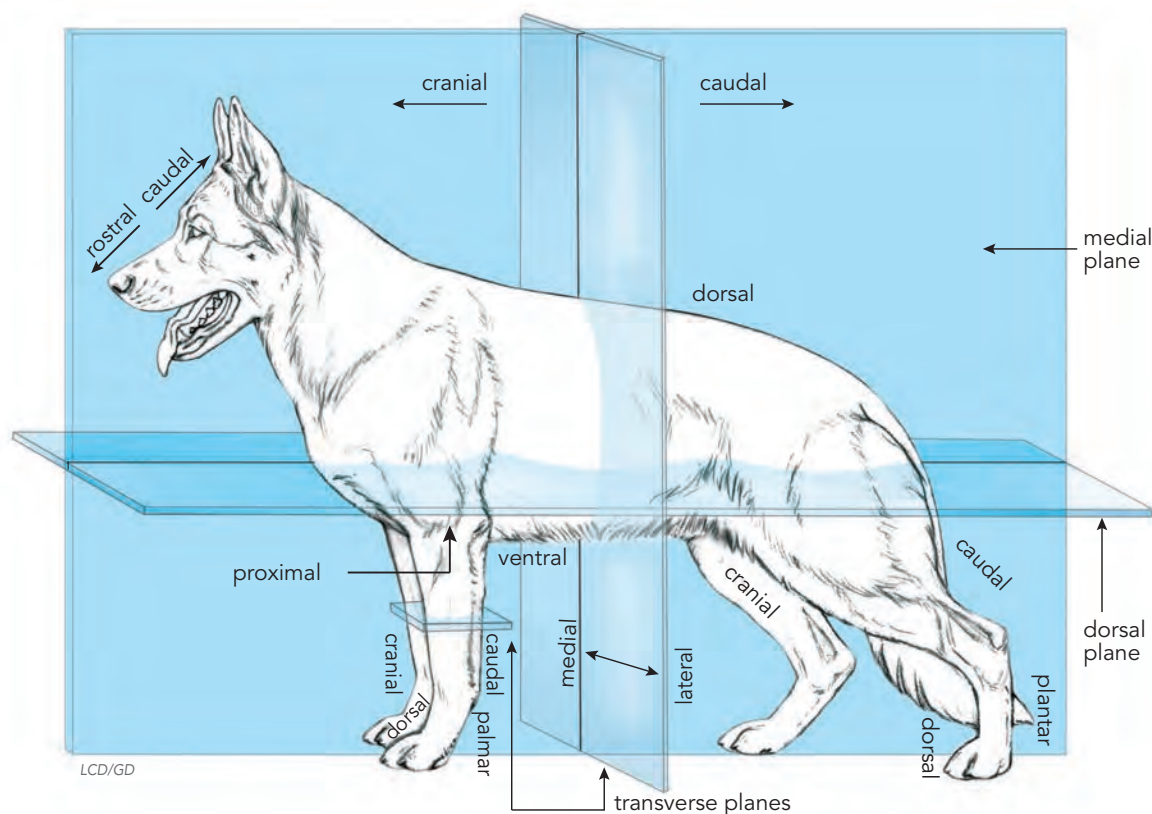
The sex characteristics should be well defined, the ears proportionate to the head in size, firm and well set, the eyes dark, and lips tight. The neck should have good reach, the withers sloping and defined, the back straight and slightly sloping, and the upperline, which runs from the base of the neck to the end of the croup, is one smooth, clean, flowing line.

The forelegs should be a little longer than the chest depth. The fore and hindquarter should be well angulated, devoid of anatomical exaggeration and excess. Viewed from the front and rear, limbs should be straight and the tail, hanging in a gentle sabre like curve, reaching no further than the end of the rear pastern.

### Proportions

The general description is based on a fully matured adult and it is important not to see a young dog through this adult perspective. German Shepherd Dogs mature over a period of about three years, and just like people, where teenagers do not have the body development of an adult, the German Shepherd Dog's body form should reflect its age. Young animals that have a fully developed appearance may impress, but most will be over-developed at maturity.

For a dog to be well proportioned it means everything is in proportion, not just its body length relative to its height. A dog is not well proportioned if, for example, the head is too large relative to the rest of the body, the neck is short, the back too long or too short, or the tibia too long relative to the femur. The diagram below is a basic guide. It is subject to a dog's stage of development and the ratio variables and descriptive latitudes contained within the breed standard.



Anatomical perspective - terminology referring to specific body orientation

mechanically as a series of freely hinged vertebrae needing further support from tensile structures to control posture. When the hindquarter is too deeply angled and the stifle is subsequently brought closer to the ground, the supporting line D and torquing line R are compromised.

Gravitational and compensatory direction of vector forces on the dog's skeleton is a complex but fundamentally important matter for serious students of dog anatomy. Several authorities have published papers, such as [Gray, (1939/1945)] [Smit, (2002)] [Nickel et al., (2006)] [Bender, (2010)] [Shahar et al. (2006)] [Carr et al., (2016)].

## RELATIONSHIP OF BONE MASS TO SIZE

### Allometric scaling

All dogs have the same number of bones in a general sense (some have an L8 and others variable tail vertebra) and are subject to an evolutionary scale that nature has created so that a dog's skeleton mass is appropriate to its biological structure and function; the dog's skeletal structure becomes stronger and more robust as its body size increases. However, the scaling algorithm demonstrates that large dogs are not simply 100% scaled-up replicas of a small dog. The scaling means if a dog were twice the height of another dog, its bones would not be twice the size and mass of the smaller dog but reflective of allometric scaling / POS.

### Principle of similitude - POS

As an animal increases in size, the relationship of all its parts should change proportionally to maintain similar power and mechanical properties. A large skeletal frame in the same proportions as a smaller frame will be weakened unless its mechanical properties are changed. To maintain the desired mechanical properties and proportions, when you double the linear dimensions (height, weight, and length), you must increase the surface area by four times and increase the volume by eight times. Therefore, the bones of larger animals will generally be proportionately narrower than smaller ones. When applying this principle to a German Shepherd Dog, as it gets larger,

its mass should increase in line with this mathematical formula; this is necessary not just to maintain visual proportion but, more importantly, to maintain structural integrity. A large dog with fine bones shows no structural impediment when it is trotting around the show ring. When seeing a dog with bones that are too fine, a judge will generally think no more of it than, 'the bones look fine'. However, it is potentially a serious impediment to a working or performance dog in structural terms because it can lead to quite serious bone injury.

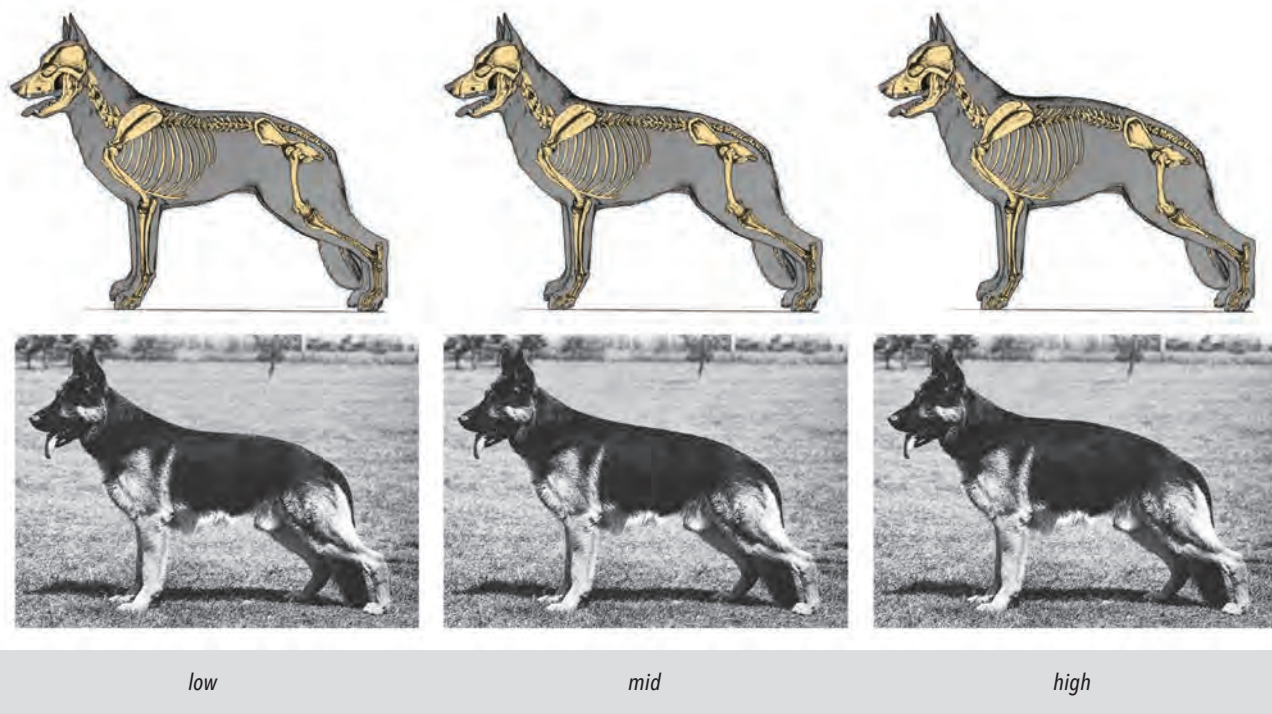
Under the principle of similitude, the cross-sectional area of bones can only increase by a power of two, whilst the dog's mass will increase by the power of three. This means the bones of large dogs are proportionally narrower than small dogs.

Human intervention has, of course, impacted this law of nature and this is seen in dogs bred for speed where muscle is optimised for power and bone strength is diminished for speed. We see it in the Italian Greyhound, where its very fine foreleg bones are subject to easy breakage. With our breed, if a male German Shepherd Dog of 67 cm were to comply with the principle of similitude its mass would impede its speed and agility



Example of allometric scaling - Great Dane and Chihuahua





If the thoracolumbar spine is concave (Fig 1) or convex (Fig 3), energy transmission and the power of endurance are impeded, with the former a greater impediment to endurance than the latter. The most effective transmission through the spine exists in the mid position (Fig 2).

So how did the initial rise in the anticlinal region of the spine and downward lumbar spine bend evolve, become normalised, and why?

Like many changes that have taken place in the development of pedigree dogs, it was imperceptibly gradual, for many unnoticed and for others not only accepted but desired! Sadly, many people have accepted the change either through **ignorance of canine anatomy**, sycophantism, or self-interest.

The dogs involved were covered in detail in the breed development chapter, but in summary, it can be said it came about because of a relatively small handful of extremely influential people preferring a style of dog that possessed this skeletal characteristic.

The anticlinal rise in the back started in the late 1970s because of a small number of dogs that had a relatively high anticlinal spine region being promoted by the SV

President, Dr Rummel. This was consolidated along with the downward lumbar spine bend in the 1980s via a preponderance of inbreeding and a breeding bottleneck during the period of SV President Herman Martin. The characteristic was not only subsequently endorsed by others of equal breed influence, but in terms of genetic frequency, consolidated. Because the appeal of showing dogs is to do well in the show ring, the characteristic was accepted without question by most specialist breed judges, and consequently by most show dog enthusiasts within and outside Germany.

Today, regardless of what the breed standard states, most specialist German Shepherd Show Dog enthusiasts could not conceive of returning to dogs that do not have some degree of curvature of the spine with its consequent steep croup, low knee position, deep hindquarter angulation and tails in contact with the ground. For those who are new to the sport of showing dogs in the specialist ring, i.e. became involved over the last 15 years or so, a curvature of the spine as seen in the following image of Jeck vom Noricum is regarded as normal, progressive, desirable, and a backline that is straight and relatively level as seen in Zamb von der Wienerau (and most 'working dogs') is none of these things, it is considered to be 'old type'.

officially recognised it in 2011. Countries affiliated with the FCI slowly accepted the provisionally registered 'White Swiss Shepherd' breed, also accommodating any local unregistered White Shepherd bloodlines using development registers. **The Australian KC recognised the breed in 2008 and The English KC recognised the breed in 2017.** The recognised 'country of origin' for the breed is Switzerland.

### The emergence and dominance of black and red colour

From the mid-1980s to the detriment of grey sable and all-black, the 'in colour' thanks to Walter and Herman Martin, became black and red, or to put it another way, black saddle, black mask and red hair furnishings. To Walter's credit and his marketing genius, in conjunction with a couple of other structural features, he created a 'Wienerau' brand. That brand is now seen in a more exaggerated form than it was in his day and is genetically overwhelming in its dominance. The black and red trend, sometimes bordering on Rottweiler black and red, has seen the demise of colour variety in the show ring, particularly wolf grey. On the other hand, ironically the wolf grey colour, due to its evolved link to strong character, has been retained as the overwhelmingly dominant colour in Dogsport.

Interestingly, based on molecular evolution support, [Anderson et al., (2009)] suggested that the black K allele was introgressed from domestic dogs into wolves. The black colouration in Kk heterozygotes and KK homozygotes was adaptive for wolves in forested areas because of concealment advantage during predation.

Grey sable is often not fully established until the dog is into its third year (van Dorssen). The original wolf colour is fundamentally important to the German Shepherd Dog breed and specifically noted here not only because of its gene-linked character traits, high drive factors and possibly even vitality, but because Wolf grey and  $A^Y A^Y$  sables (grey or gold) cannot produce colour paling unlike the popular black and gold/red/brown colour,  $A^G A^G$ . Through evolution the Wolf grey colour evolved in Grey wolves and has important camouflage benefits and gene linked survival behaviour patterns.



Grey wolf - agouti camouflage Image: Wonderful Earth

### Colour diversity

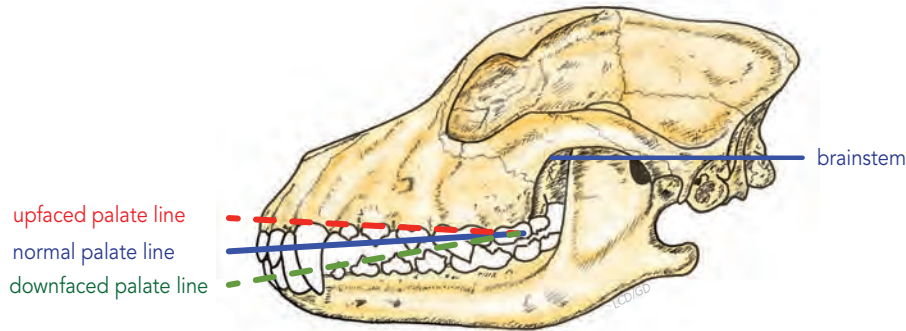
Colour diversity, particularly relating to the retention of the colour wolf grey, facilitates genetic diversity, is an important principle that contributes to the maintenance of the breed's heritage, its ancestral herding dog past, and provides a counter to colour paling.

### Coat colour and its relationship to character and behaviour

The consensus of the majority of dog writers and breed authorities is that there is no gene linked relationship between hair colour and character/temperament in German Shepherd dogs, the most obvious being strong character and agouti - wolf grey  $a^t$ . However, scientific evidence suggests coat colour, more particularly agouti and character/temperament are connected. Agouti animals have a link between hormone chemistry, neural development, and pigment production.

*'Agouti animals have a little molecule that switches pigment production between light and dark pigments on a single hair as it grows, creating bands. Non agouti animals lack this little molecule, so their hair is completely dark. This little molecule, called the "agouti protein," is also found in the brain, where it blocks neurochemicals known to have potent effects on behaviour and physiology. Agouti animals have different neural profiles of neurotransmitters*





German Shepherd Dog palate/brainstem line  
Blue=normal Red=up-faced Green=down-faced

Notwithstanding the majority of circa 1900 German Shepherd Dogs were quite flat in the forehead, straight in their nasal bridge and fairly parallel in the planes of the forehead and nasal bridge, up-faced and down-faced dogs existed from the breeds earliest days and the former can be seen today in quite a number of working dog lines. From the development period 'primarily' denoted by the successive dogs, Rolf vom Osnabrücker Land (1950), Condor vom Hohenstamm (1958), and Mutz aus der Kückstrasse (1962), flat foreheads (and tight lips and flews) such as seen here, have largely disappeared. Within the breed's primary genetic population of



A relatively common German Shepherd Dog head profile circa 1920

show dogs today, there are significantly far fewer down faced dogs but far more large to **very large headed**, up-faced dogs, particularly regarding the former in long stock coats where via gene linkage it exists in the majority of long stock hair animals.

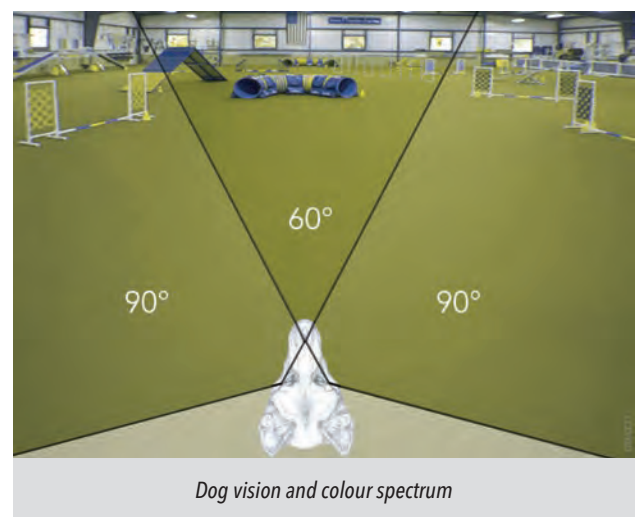
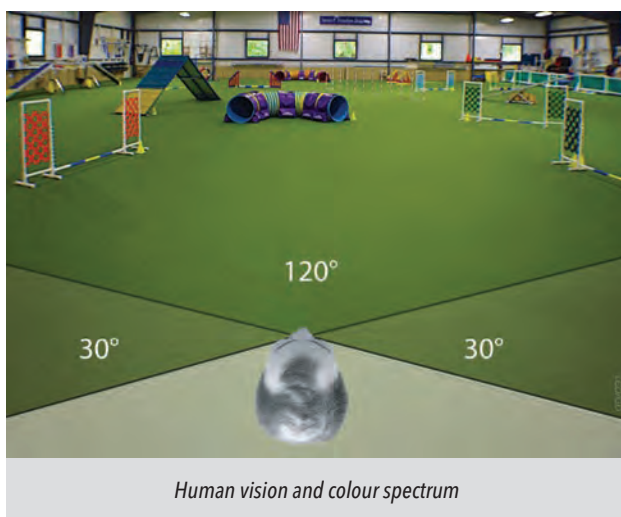
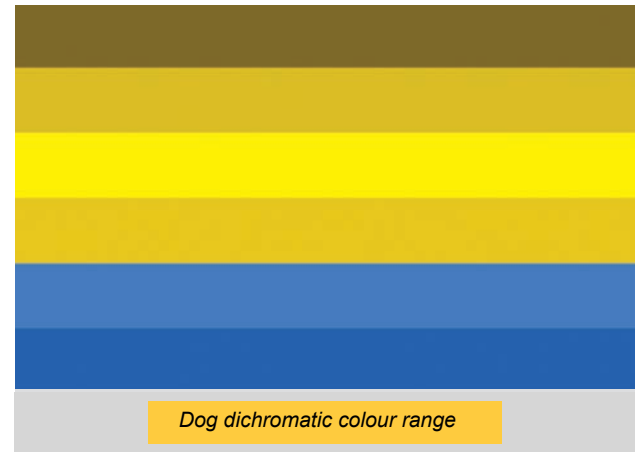
An up-faced palate line, especially when it is associated with a flat forehead, is not conducive to the German Shepherd Dog

or the uniquely characteristic purity of essence and visual form of the wild dog mesocephalic skull/head shape and expression.

What is interesting about the relative forehead/nasal bridge characteristic, is that the SV standard once upon a time (circa 1980) stated 'the forehead and nasal bridge should be almost parallel'. Why this was amended to only refer to the nasal ridge being straight is curious because the amendment ceased to say an up-faced or down-faced head is undesirable, thereby suggesting an up-faced or down-faced head is acceptable, and hence



Long stock hair up-faced palate line - skull and head, lateral detail



but only recognise the same object when they were stationary at a distance of 585 metres or less. This study may indicate that a dog can only see a far distant person if that person is moving.

- The left side image shows human vision acuity and colour spectrum: monocular and binocular field of view 180°. Vision acuity is clear all the way to the back of the stadium.



## DOG GUM COLOUR CHART

### pink

Healthy pink gums when pressed with your index finger, should lighten to a white or pale pink color and then quickly (within two seconds) return to the normal pink color when you take your finger off of the gums.

### blue

### purple

Cyanosis - lack of oxygen in the blood, trouble breathing, pneumonia, asthma, choking, heart disease, low blood pressure, and/or hypothermia. A purple tongue can also be caused by poisoning. Pleural effusion is also a cause, this is when there is an accumulation of fluid in the chest consequent to liver or kidney problems or tumours.

### bright cherry red

Exposure to toxins, heat stroke, tooth infection, high blood pressure, and/or carbon monoxide poisoning.

### slightly red

Topical irritation, such as from chewing a new toy, gingivitis, and/or infection.

### yellow

Jaundice - liver, lung, spleen, heartworm, cancer problems, anemia, and/or massive destruction of red blood cells.

### white

### cream

Anemia - heart problems, blood clotting disorder, internal bleeding, kidney disease, shock, bloat, rat poison, heavy metal poison, cancer, and/or hypothermia, loss of blood.

### grey

After pressing the gum with your finger a slow capillary refill indicates shock, lack of oxygen in the blood.



*Healthy gums*



*Cyanosis*



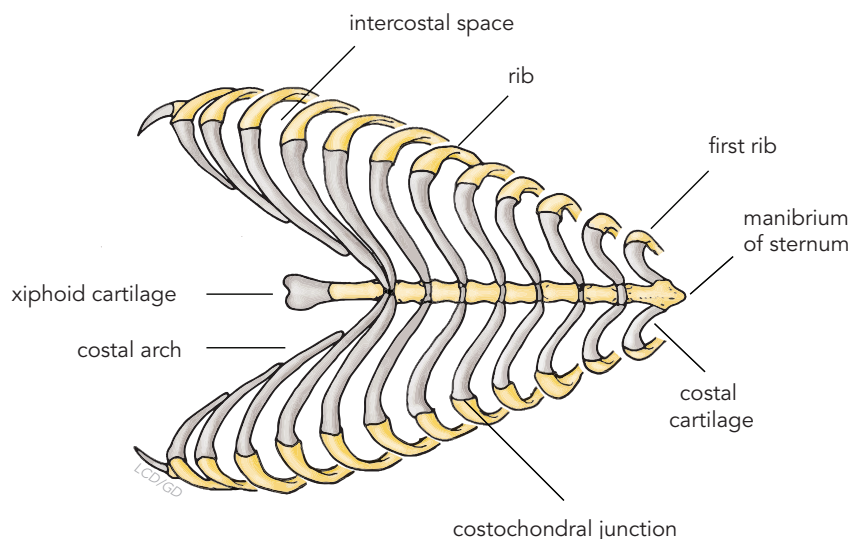
*Teeth infection*



*Jaundice*



*Early stage anaemia*



Rib cage ventral view

three ribs are called 'floating ribs' because they have one shared attachment point to the sternum, and when a dog is the right weight and condition, the outline of these three ribs should be visible. The last rib is called a 'false rib' because it has no attachment to the sternum, and that allows flexibility of the T13 vertebra.

When seen from above, the ribs show a defined waist behind the floating rib. This shape allows the forehand limbs freedom to manoeuvre whilst allowing ample space for the vital organs.

Costal cartilage is segments of cartilage that connect the sternum to the ribs and help to extend the ribs into a forward motion. The cartilage also contributes to elasticity within the walls of the thorax, allowing the chest to expand during respiration.

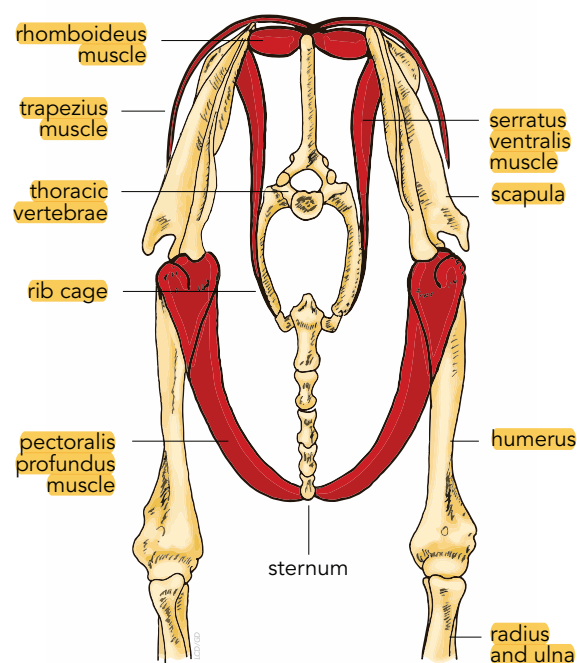
*'Because there is no rigid skeletal connection between the sternum and scapula, muscles with a vertical orientation, which link the forelimb and trunk, must be active to support body weight and define the fulcrum of the shoulder. It is this latter set of three shoulder muscles (rhomboides, pectoralis and serratus ventralis) with anatomy appropriate for resisting gravity that is often referred to as the 'muscular sling' of the pectoral girdle.'* [Kardong, (1998)]

*'The thoracic portion of the 1.5cm to 2cm thick serratus ventral muscle is primarily or entirely responsible for support of body weight at the pectoral girdle during trotting.'* [Carrier et al., (2006)]

### Rib cage muscle attachment to the shoulder blade

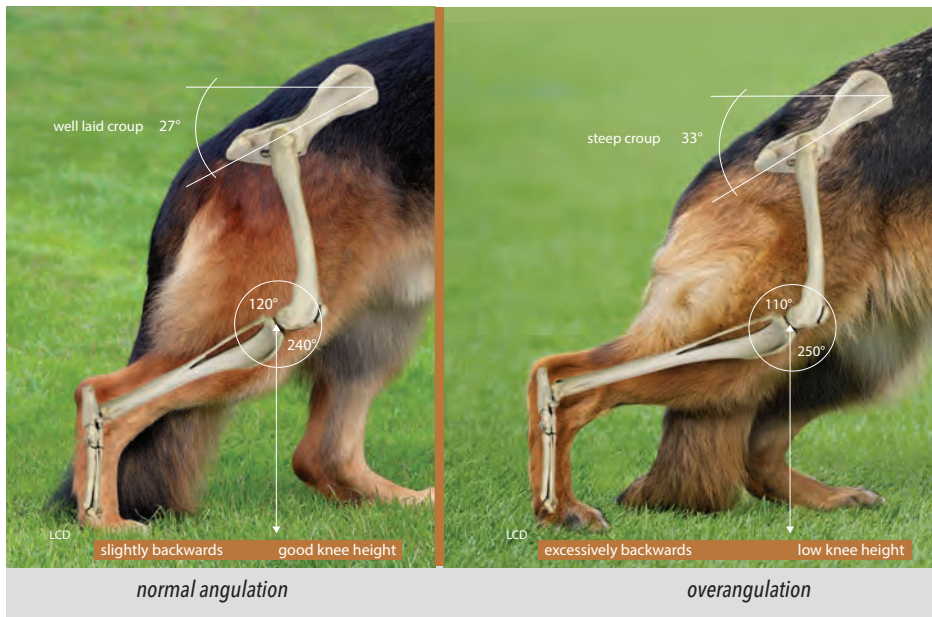
The three muscles that attach the rib cage to the shoulder blade are the trapezius, rhomboides and serratus ventralis muscles. Speaking in general terms, these muscles allow the forehand's rise, fall and rotation and to absorb the enormous impact forces imposed on the forehand when the dog is gaiting, jumping, galloping, braking, and turning quickly at speed.

**Trapezius:** A pair of thin muscles attached to each side of the scapular spine. Attached to the cervical vertebrae starting at the C3 and extending and attaching to the



Muscles of the rib cage attachment - cross-section through the rib cage at the T1





Derived from the sickle because it has a forward-pointing cutting blade as opposed to a straight one. It is a term rarely used in the German Shepherd Show Dog sport but should be.

Viewed from the side, moderately angulated dogs tend to stand naturally with their hock/rear pastern perpendicular to the ground. Underangulated dogs stand naturally in what one might call a reverse sickle, i.e. overstretched. Dogs that are overangulated in the hindquarter will stand

**Less versus more**

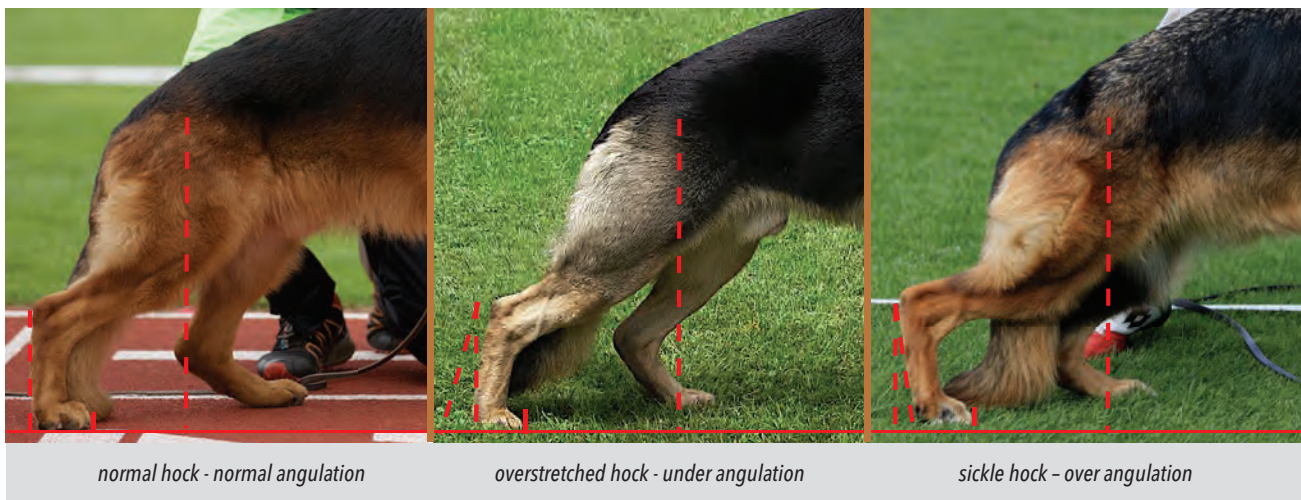
Under angulation, assuming all else being equal and incremental to its degree, provides very good hindquarter weight-bearing capacity and stability in stand and movement but impedes the drive and stride excursion distance. Over angulation increases the drive and stride excursion distance but diminishes the hindquarters weight-bearing capacity and stability. Moderate angulation provides the right balance between weight-bearing capacity, hindquarter stability, drive, and stride excursion distance.

naturally with a sickle hock. The greater the degree of over angulation, usually because of an overlong tibia, the greater the degree of rear pastern forward angle - and as an aside, viewed from the rear, as stated previously, usually stand cow hock. (See cow hocks)

**Sickle hocks**

Not to be confused with cow hocks, even though one is nearly always associated with the other.

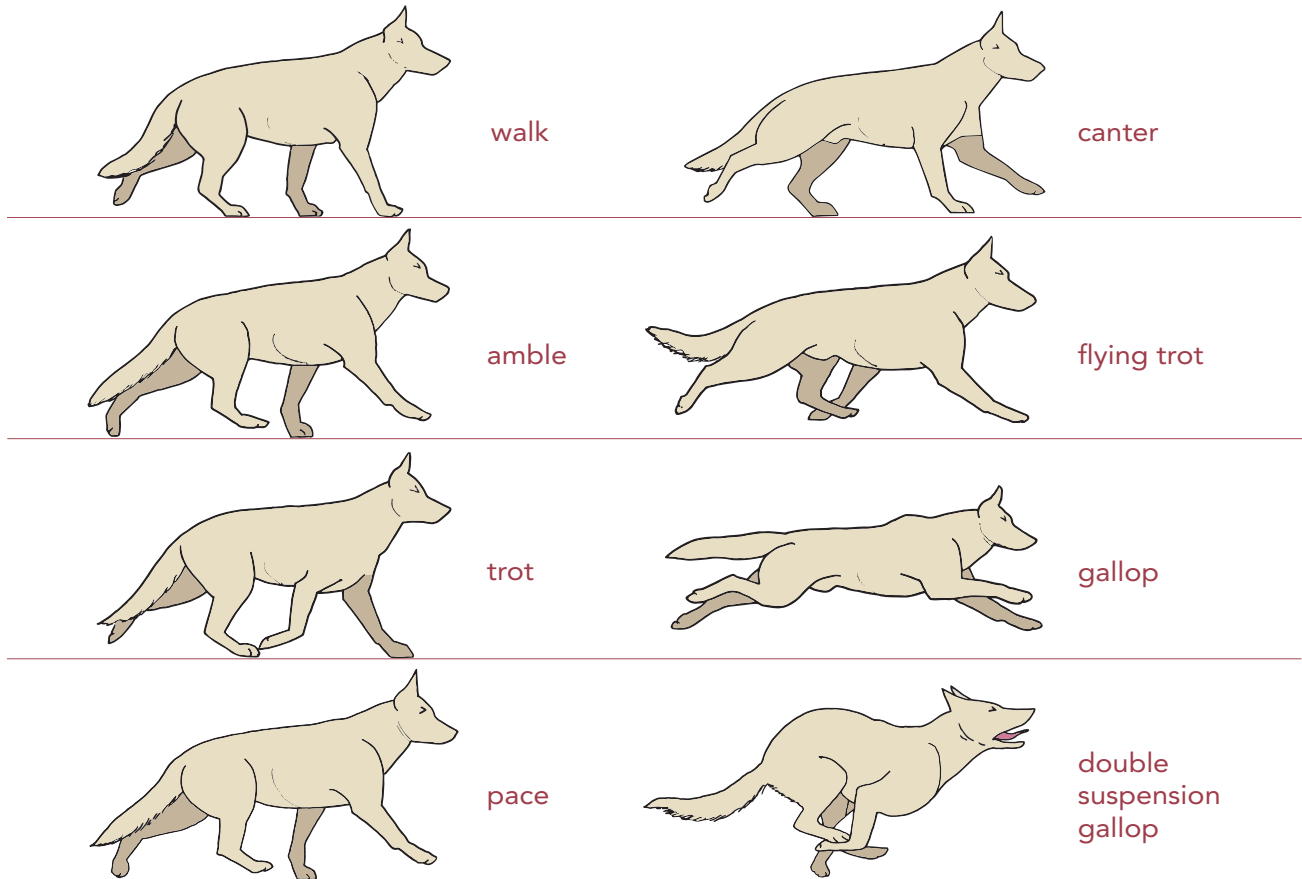
When a dog with moderate and balanced hind angulation is standing with its rear pastern perpendicular to the ground, the angle of the femur and tibia and the horizontal distance of the foot to the hip joint creates a scaffolding framework and weight transfer that optimally supports gravitational load. This gives the dog a sense of stability. No different to humans who, relative to their skeletal frame, stand with their feet placed in a



## GAIT, GAITING PATTERNS AND GAIT TRANSITION

### Gait

The word 'gait' comes from the Old English word 'gate', as in 'way', and the Old Norse word 'gata', as in 'road'.

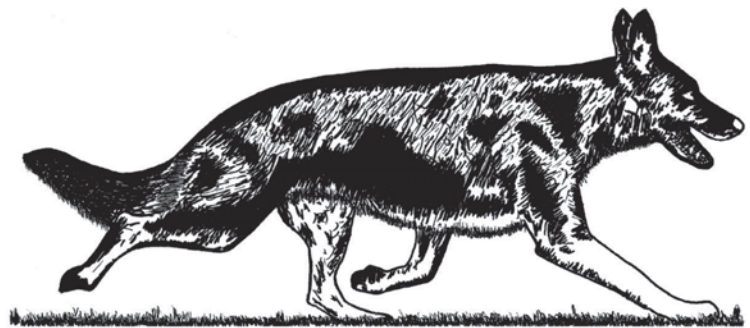


### Gaiting patterns

A great many authors of dog books write about the various types of gait patterns based on those used at horse shows rather than canine gaiting authorities such as Hildebrand, Alexander, Gambaryan, Brown, Page Elliott, etc. Consequently, there are variations between dog writers regarding the various types of gaiting patterns. This book is based on the aforementioned canine authorities collective gaiting patterns.

Breed standards always describe dogs trotting, and a style that reflects the highest level of efficiency relative to their function. In the case of the German Shepherd Dog, the trotting style is reflective of an agile, athletic, free-moving, shepherding dog with an expansive ground covering stride and extraordinary power of endurance.

An iconic sketch of the 1976 German Sieger Bodo vom Lierberg by Dr Walter Gorrieri 'at the point of having just completed a period of flying trot suspension'. Like the earlier image of Ester, understanding what this image depicts at a specific point in the footfall sequence and, **more importantly, why, is fundamental to understanding the finer nuances of canine locomotion and gait.**



*Bodo vom Lierberg*





Normal fore reach

Lifting the forearm at the elbow



Normal pendulum-like foreleg swing



Lifting the forearm at the elbow

When this high lifting occurs in a trotting dog, it destroys the forearm's use of pendulum energy-efficient momentum because significantly more abductor muscle power is required to lift the forearm/foreleg. At speed, this entails a complex footfall balancing act, and in many cases, both the fore and rear limbs travel too far in both directions causing excessive overreach and consequent palmar face of the forward reaching rear pastern to come into contact with the ground.

In today's show ring environment, this exaggerated, high energy-consuming gait, particularly when displayed at high speed, is often greeted with rapturous spectator applause.

### Elbow joint

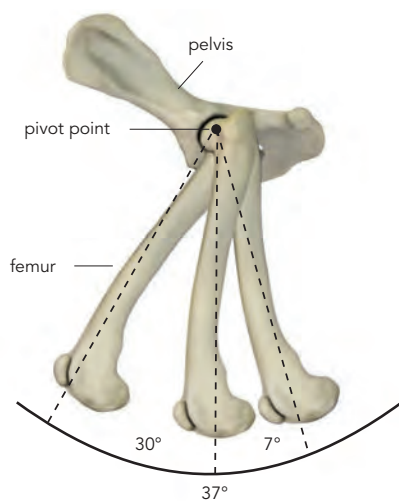
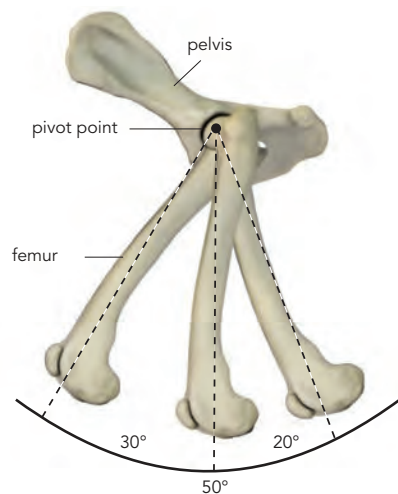
The elbow joint is a complex hinge joint that allows for the flexion (forward/upward rotation) and extension (rearward/upward rotation) of the forearm relative to the upper arm, and rotation of the forearm and wrist. (See Anatomy chapter – elbow joint)

Extension of the elbow joint is achieved by contraction of muscles attached to the olecranon. Consisting essentially of the triceps brachii muscle range, its range of motion is limited in torsion by the anconeal process and by the collateral ligaments.

### Assessing elbow joint rotation and extension

*'During locomotion, the forearm rotates around a central pivot point in the elbow joint allowing flexion of 28° and a maximum angle of excursion of about 165°.'* [Fischer, (2011)] Professor Bruno Peirone indicated 36° to 166°, (2018)]

The muscles that control elbow flexion and extension and their firm attachment to the elbow are important, so that the forelimbs remain stable and true in their swing phase, particularly during the trot.



Extension and Flexion

### The femur

Contrary to what many people believe, **in a balanced hindquarter** the femur contributes more to stride length during the walk and trot than the tibia. It needs to be of good length for the attached muscles, i.e. the shorter the femur, the shorter the muscles and therefore potentially the less effective the hindquarter thrust. Whilst a long femur is desirable, it needs to be balanced in its length against other interactive locomotive bones and, for reasons of efficiency, must not be so long as to bring the stifle joint too close to the ground during the fully extended backswing phase.

*'The femur's extension and flexion during the moderate trot is in a range of 37° for the GSD Working Dog and 50° in the GSD Show Dog.'* [Fischer, (2017)]

This very broad range of rotation is affected by several variables - the height of the hip from the ground, femur length, angle of the pelvis, length of the tibia, muscle ligaments and forehand construction - particularly the length and angle of the scapula.

*'The rotation of the femur in the hip joint is responsible for the greatest contribution to step length during the walk and trot, far more than the tibia. On average, 70% of the ground distance travelled by the rear limb comes from the hip joint, with the tibia and foot contributing 25%.'* [Fischer, (2011)]

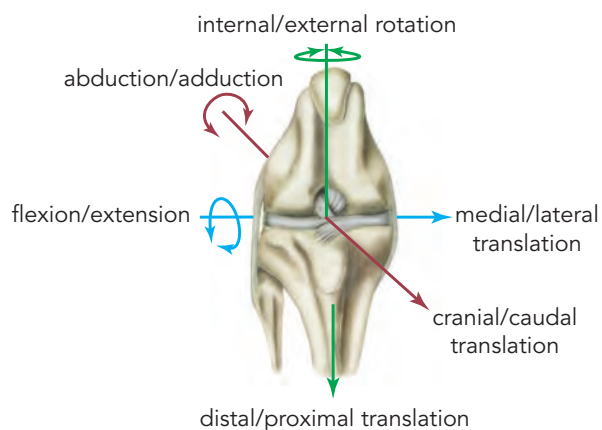
### The stifle joint - knee

*'During locomotion, the motion of the stifle joint is a complex combination of gliding, rotation and flexion/extension.'* [De Rooster et al., (2006)]

*'The femoropatellar joint in which the kneecap glides like a sled over the articular surface of the femur.'* [Schreiber, (1947)]

*'Flexion of the stifle joint starts earlier than that of the hock joint in the last quarter of the swing phase and continues in all breeds for about the first two-thirds of the stance phase, after which extension begins.'* [Fischer, (2018)]

The stifle diagram shows the six degrees of freedom of the canine stifle: adduction/abduction, flexion/extension and internal/external rotation.



Stifle joint - knee



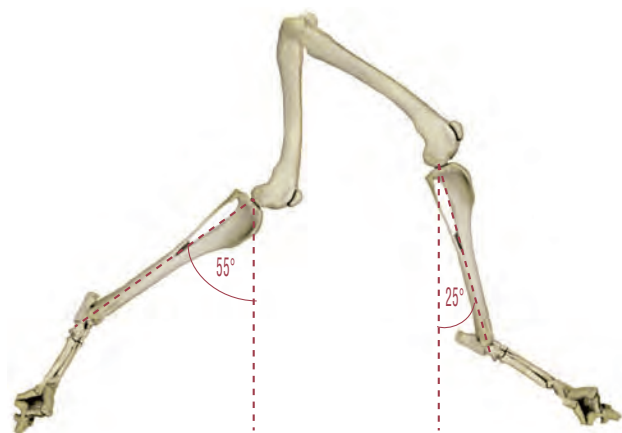
### The patella

The patella enhances the leverage the quadriceps tendon can exert on the femur, increasing muscle efficiency during locomotion. Contraction of the quadriceps femoris muscle group pulls the patella toward the thigh through the quadriceps tendon, thereby extending the stifle. The patella, in turn, pulls on the tibia through the patellar ligament to extend the leg at the stifle. This action is important for walking and running, but it is especially important to the dog when leaping upward or jumping hurdles and the like.

### The tibia

The engineering principle applicable to the tibia is that the effort required to move a limb is a function of its mass, and the longer the bone, the greater the distance from the joint and the greater the effort/energy consumption required to move it.

Given that engineering fact, the tibia should not be much longer than the femur (+ 5% to 10%). In addition to the effort required, when the tibia is too long, 'potentially' the hindquarter stride distance can be increased, but when that happens, especially when associated with a powerful hind drive, a normal forequarter cannot equal the stride distance. This creates a rear to fore footfall timing problem and the dog generally compensates with high lifting of the forelegs from the elbows and or high lifting of the hind feet. The degree of high lifting and catch-up timing delay is relative to the degree of rear stride to fore stride mismatch. Additionally, the Achilles tendon is excessively elongated, thereby losing



*Nearside tibia rotation at the medium speed trot - forward and rearward angles off the vertical*

elasticity. This loss of elasticity causes an inward rotation of the hindfoot when the dog is walking or trotting.

### Overlong tibia

The locomotive affliction imposed on the dog by an excessively long tibia has had dire consequences for the breed. During locomotion, the distance between the stifle joint and the tarsus joint is too great, manifesting itself in excessive knee rotation and the caudal part of the tibia being placed under twisting stress. This creates hindquarter instability in the walk and trot, energy displacement during the gallop, and an impediment to jumping.

When the tibia is too long, the hip and stifle joint are drawn closer to the ground, and during locomotion, the stifle joint is subjected to a significant increase in gravitational load because there is a less direct upward line from the hock joint onto the head of the femur into the stifle joint and an increase in acetabular friction. The relevance of this is that inside the stifle joint, between the articulating surfaces of the femur and tibia, are C-shaped, fibrocartilaginous disks covering the face of the bone called menisci. Over time, this friction can cause damage to the meniscal surface, especially if the dog is a working dog.

### The impact of an overlong tibia on gait

Impacted incrementally by its degree of length, dogs with an overlong tibia will generally incur and display the following characteristics when gaiting. Increased hip and knee joint rotation, joint overload, twisting of the distal tibial shaft (distal internal tibial torsion), excessive hind limb adduction (inward drawing and even crossing over the body's centreline), hind paw instability and cow hocks (rear toes turned outward, tips of the hocks turned inward). A lack of well-developed upper thigh muscle mass negatively impacts these characteristics; conversely, well-developed, broad upper thigh muscle mass impacts positively.

A gait commonly associated with a low hip/knee configuration and an overlong tibia is the amble or pace with a pronounced horizontal plane left to right sway of the pelvis, especially if there is significant hind paw instability. Often engaged by the dog from the earliest phases of gaiting, this form of preferential ambling/pacing is becoming more commonplace (normalising) and increasingly acceptable.

heel - sole of foot - ball of foot. When running, it is the full under surface of the foot that absorbs the shock. In a well-constructed and balanced dog, only the large cushioning metatarsal pad of the rear feet make contact with the ground, not the plantar face of the rear pastern, and certainly not the hock.

### Hind paw

The underside of the human foot, especially the sole is equivalent of the rear pastern of a dog, and is designed to absorb shock and protect the foot bones from direct shock. It does this via 'plantar fascia'. Plantar fascia consists of layers of fibrous tissue that extend from the heel bone to the toes. The fibrous tissue is a powerful shock-absorbing mechanism that stabilises the whole foot heel to toe and supports the arch of the foot during locomotion.

A dog does not have plantar fascia. All the shock-absorbing mechanisms of the dog are contained within the pads of its feet during the trot, particularly the metatarsal pad.



Human foot showing strips of plantar fascia

### Overlong hock

An overlong hock in German Shepherd Dogs is often associated with an excessively long tibia, i.e. gene linked. One might refer to this as the reverse of 'well let down hocks'. When employed as a lever, an overlong hock/rear pastern, factors up speed, consuming a great deal of energy and over a distance impedes endurance by overtaxing the forehand. When associated with an excessively long tibia, the outcome is significant instability of the hocks, especially in puppies and young dogs when thigh muscles have not yet fully developed.

### Short hock

Short hocks are always associated with an equally short rear pastern. Medium length produces a nice

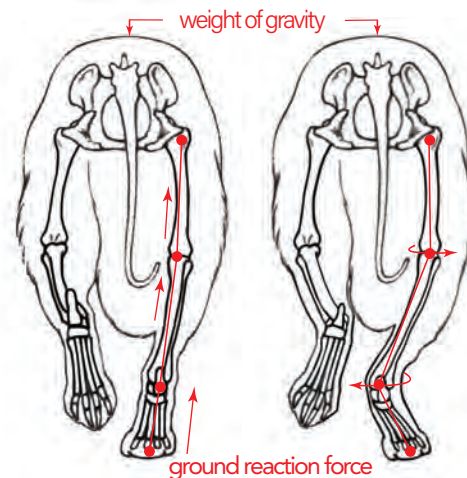
balance of speed and endurance. Where an overlong hock excessively increases speed in the trot, a short one markedly reduces it. A short hock also creates a locomotive rear to fore stride imbalance. At fast trotting speed in show competition, dogs with a short hock will quickly assume a gallop to keep up with the other dogs.

Relative to the degree of shortness, a short hock brings the hip and stifle closer to the ground, reducing leverage and thereby reducing speed factoring. It disrupts the horizontal alignment between the hip and shoulder joint and brings the tail into contact with the ground. A relatively high percentage of LSH have gene-linked short hocks.

### Unstable hocks during locomotion

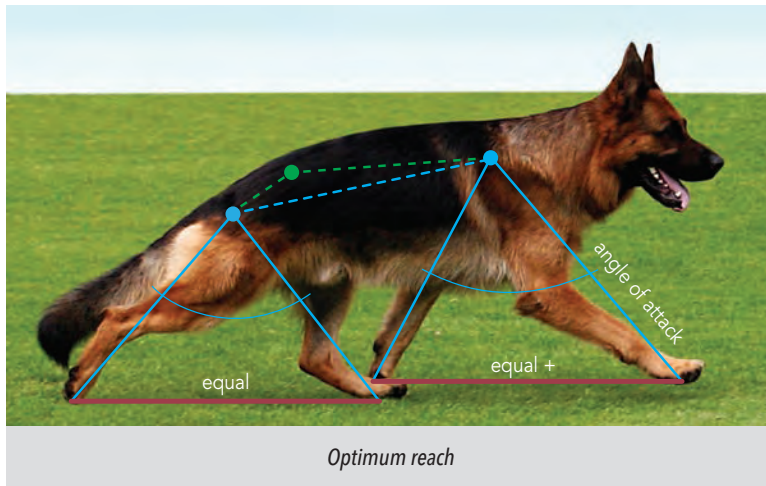
There are many reasons why the hocks can be unstable during locomotion, and a number are covered in the following diagrams. The common thread is that unstable hocks create deflection and dissipation of transmitted energy from the foot through the tibia and femur to the hip joint. Particularly at the point when the forward reaching rear foot initiates its rearward push.

The diagram below shows the point at which the transmission line, foot to hip joint, is 'potentially' at its straightest alignment. As the limb extends rearward and the feet incrementally turn very slightly outward, the straight line dissipates to then come back to the linear alignment as the limb moves forward again. As a general rule, one that can be impacted by genetics, longer the tibia, the greater the amount of dissipation and vice versa.



Energy transmission - straight and deflected

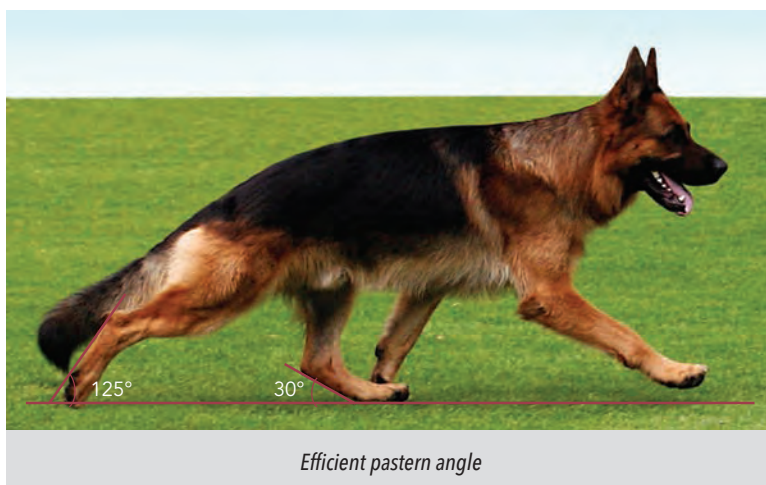




such as a high lifting of the forearm from the elbow, high lifting of the hock and others so subtle as to only be visible on slow-motion film.

The pastern angle image demonstrates the efficient rearward extending and forward reaching hock/rear pastern angle during the medium speed trot. Overangulated dogs often finish the rear pastern back reach at  $90^\circ$  to  $100^\circ$ .

When the rear foot is in its swing stage, and the adductor muscle has pulled it forward to the midline of the body, the rear foot has lands on the ground and then moves in the rearward direction. As soon as it is under the hip joint, the forward thrust commences propelling the dog forward again. The thrust ends when the foot reaches its full extension, with the opposite foot taking over when it makes contact with the ground midway under the body.



The muscles pulling the front leg forward are attached to the scapula and upperarm and they in turn are attached to the base of the neck and skull. When these muscles receive the message from the brain's command centre to contract, the upperarm and, to a lesser degree, the shoulder blade and foreleg, are pulled forward.

### THE IMPORTANCE OF MODERATION, BALANCE AND HARMONY OF ALL PARTS

Harmonious, balanced, effortless, gliding, ground covering, and enduring movement as described in the opening preamble only comes about if everything is in balance.

If the croup is short and steep, causing reduced thrust, even if the dog has a perfect forehand, it can only match the rear hand's capacity and so the forereach will be shortened even though it may be able to reach further.

The reverse applies with having an ideal hindquarter but short steep upperarm. The dog will deal with this in several ways. It will reduce its hind drive to match the forehand's capacity, thereby not overloading the forehand, or it will deliver the drive unencumbered but lift the forelegs at the elbow as in high hackney stepping to disperse the unwanted energy. If both the fore and hindquarter is overangulated, the stride distance might be impressive, but at the cost of joint and hindquarter stability, fleetness of foot, agility, and the power of endurance.

From this, we can learn that a dog equally impeded in both front and rear and, therefore, in structural balance, will have a reduction in stride excursion distance, but the gait will be balanced and enduring. A dog with very good forequarter angulation but overangulated hindquarters will have a longer rear stride than fore stride, and consequently, the gait will lack balance, soundness, and the all-important shepherd dog power of endurance. A very good 'all else being equal' example is to analyse and compare the 1967 Sieger Bodo vom Lierberg and 1983 Sieger Dingo vom Haus Gero.

*'He is your friend, your partner, your defender, your dog. You are his life, his love, his leader. He will be yours, faithful and true to the last beat of his heart. You owe it to him to be worthy of such devotion. Our dogs will love and admire the meanest of us and feed our colossal vanity with their uncritical homage.'*



*Helen Keller (1880-1968) and her German Shepherd Dog*

American author of 14 books, political activist, disability rights advocate and lecturer, the first deaf-blind person in America to earn a Bachelor of Arts degree and passionate lover of dogs.