Effective Wolfdog Phenotyping

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We have all heard people refer to their Wolfdog as High Content, Low Content, F generation, and even giving percentages at times. Just how does one arrive at these conclusions? Many experienced Wolfdog people use scientific methods of physically evaluating canines and determining Wolf content. This article is one such method in use today. The contents of this article will not make the average person an overnight expert, but will help guide you to a better understanding of the physical make up of the Wolfdog.

Percentages, F Generation, and Content Levels

When you hear people say, “My dog is 75% Wolf,” what does that mean? Mathematically, it means just exactly what you would assume: The dog in question is composed of ¾ Wolf. However, keep in mind this can be a highly inaccurate method of determining content as math and genetics are not similar.

Filial generations, also known as F Generations or simply F-Gen, represent the number of parent-child relationships in a breeding sequence. If you breed a Wolf to a domestic dog, you have an F1 Wolfdog; this means first generation parent-child affiliation. The F1 Wolfdog, bred to another domestic dog, gives you pups that are classified as F2 Wolfdogs; this means second generation step from the original parent-child relationship. Content Levels tend to be classified in four parts: High Content, Mid Content, Low Content, and No Content. These are used to express how much true wolf physical and behavioral markers are exhibited by the canine in question.

Genotyping vs. Phenotyping

In determining a Wolfdog's content level, it is important to first understand the two most important terms used in the process: genotyping and phenotyping. Simply stated, an animal's genotype is all of its physically inheritable DNA traits. This is everything from the obvious, such as having four legs or two eyes, to the less obvious, such as the length of the intestinal tract or placement of the lungs. An animal's phenotype is the visible expression of its genotypic markers. This can be compared to having four short legs instead of four long legs, or two
brown eyes instead of two blue eyes. Since Wolves and dogs share such a closely related genotypic structure, the process of accurate phenotyping provides a way to help answer the question, “Is this a wolf, or a dog?”

Why do we Phenotype a Wolfdog?

The phenotyping process is highly important when determining the presence of Wolf in rescued and purchased animals. Phenotyping is much more effective than blood quantum percentages and Filial Generations, because it allows for behavioral traits to be matched to physical traits. Just because a dog has four legs doesn't mean it's potentially a Wolf. Are its legs long, short, thick, turned outward or inward? When the dog runs, does it trot and lope like a Wolf, or does it exhibit a high-stepping prance? By more accurately discerning the potential Wolf in a Wolfdog, you can determine if a breeder is accurately representing a true Wolfdog line, and you can more easily determine if a rescued animal needs to be placed in a specially qualified home based on the fact that it's a Wolfdog. When properly evaluated, you can determine a Content Level for a Wolfdog.

The Wolfdog

A Wolfdog (also commonly referred to as a Wolf Hybrid) is typically referred to as the offspring result of breeding a Wolf with a domestic dog. It can also be the result of a Wolfdog breeding to another Wolfdog or even a Wolfdog breeding to a Dog. The typical result is not a wild canid. Almost all captive Wolf stock used today have been bred in captivity and domesticated for nearly 100 documented years, preserving their physical qualities of wolf while giving them some of the behavioral traits of a domestic dog. The Wolf and dog are very close family members. They share the same taxonomic classification of species and even share over 99% of the same DNA sequence. However, there are some physical, mental, and behavioral differences between the Wolf and most Dogs. These differences can be effectively identified and assist in determining the content range of a particular Wolfdog.

Preparation

Preparing to phenotype is very important. Prior to being able to effectively perform this task one must be familiar with the physical appearance of not only wolves but many different breeds of dog as well. Many breeders choose different breeds of dog to create their Wolfdog. Some of these breeds include but are not limited to Siberian Huskies, Alaskan Malamutes, & German Shepherd Dogs. Each one of these breeds has different physical appearances that you must be able to identify to determine content range. It is recommended to extensively research all of these particular canines prior to attempting to Phenotype a Wolfdog. It is recommended
that the candidate for Phenotyping be above 12 months of age. Prior to that age they are ever changing and extremely difficult to pinpoint content. It is also recommended that the candidate be phenotyped in person and not by a photograph. Photographs do not always effectively show many features necessary to arrive at a correct content.

**Breaking Down the Canine**

This is a method that can get some very accurate results though it does require a greater amount of time over some other methods used. This method involves separating the Wolfdog candidate into 20 different categories or parts. Each category should be examined and classified as dog or wolf. At the end of this evaluation the individual totals should be added. These final figures will determine the physical content of wolf in the candidate. For example if 10 categories were dog and 10 were wolf then the candidate would be a Mid Content Wolfdog.

**Evaluating the Categories**

**Head**

The head of a wolf is large in comparison to its body. The angle of the side of the head running from the eyes to ears should be at least 45 degrees giving the head a wedge shape. The top of the head should have a slight slope from the occipital bone (bump at the back of the skull) to the eyes. There should be a slight stop or drop at the eyes. The width of the skull at the occipital bone should be 2/3 the total length of the skull from the occipital bone to the eyes. Most dogs will not possess these head structures.
Muzzle

The muzzle length of a wolf should be the same length or slightly longer as the skull for occipital bone to eyes. The lips should be close fitting and black or dark colored. Jaws should be massive and muscled. Most Sled Dogs will have shorter Muzzles. GSDs can have very similar Muzzles.

Nose

A wolf’s nose is large and black & texturous. Many Sled Dogs can have Pink or Striped noses.
Ears

The ears of a wolf are medium sized in relation to the head and well furred inside. The ears join the skull on a line with the upper corner of the eye giving a wide appearance between them. The tips of the ears are rounded. Long ears or ears set further on top of the head are signs of GSD. Short pointy ears are common in some sled dogs. Floppy ears can show evidence of other breeds of dog.

Wolf Ears  AKC Husky Ears  AKC GSD Ears

Eyes

Wolf eyes are almond shaped. They are close set and oblique forming a 45 degree angle on the face. The wolf eye color is Yellow, Amber and sometimes Green. Many sled dogs have almond shaped eyes as well. Blue eyes are signs of sled dogs. Brown eyes are common among most dogs.

Wolf Eyes  AKC Siberian Husky blue eyes
Teeth

All canines should have 42 teeth. The wolf will have longer canine teeth than most dogs. These teeth should appear massive and curve slightly toward the inside of the mouth. Some breeds of dogs like sled dogs will have smaller canine teeth. GSDs will have similar teeth being just slightly smaller and more difficult to identify. Some other breeds of dogs will have a slight to a major under bite or an over bite of more than ¼”.

Face

After reviewing all of the above features on a particular candidate, the face as a whole should be reviewed paying close attention to markings and coloration. Wolves can come in a variety of different color combinations. Due to this their facial markings can differ as well. Solid black and white Wolves will have few to no facial markings. Others color combinations can display masks. Many Sled Dogs can have similar masks as well. However, many Sled Dogs have facial borders rather than masks. This would consist of widow’s peaks and other visible lines around the face. These lines usually consist of two opposing colors with no blending like white/black & white/red. Wolves have a more blended color in their masks. It is also important to look at the cheek tufts. This is a patch of coarse fur on each side of the face that is approximately 1”-3” inches behind the end of the jaw line. These tufts signify the beginning of the mane (also called the ruff) and on a wolf should not be curly, wavy, or flowing. Due to the wolf having a larger head and neck from most dogs, this should be longer or bushier than most dogs.
The neck of the wolf will be strong and proportionate to the rest of its body. The coat on the neck should be thick and fur standing out. During walking or running the neck and head is lowered to an almost even line with the back. Many Sled Dogs will have a short neck in proportion to its body. Malamutes in particular will have larger thicker looking necks. Some out of standard GSDs and Malinois will have a thinner looking neck.

Chest

The chest of a wolf is very narrow and shaped like the Keel of a boat. The ribs are long and flattened on the sides. The ribs should reach the point of the elbow in length. Most Sled dogs will have a much wider chest. Some other breeds of dogs can have a barrel shaped chest.
Shoulders

The wolf has shoulders that are close at the withers. This gives a narrow appearance from the front. The shoulder blade and humerus should form a 90 degree “V” at the joint. Then a 45 degree angle at the elbow. This gives the wolf a great reach. Most working dogs have wider set shoulders. Many also have less of an angle between the shoulder blade and humerus. The humerus is generally shorter in some dogs.

Forelegs

The wolf has unique leg structure. The elbows turn slightly in toward the ribs. The legs are long, large boned, and straight toward the wrists. The wrists are turned slightly outward. The length of the legs should be 2/3 the length of the body. Most dog breeds have straight looking legs and shoulders. Sled dogs, unless bred out of standard, have
shorter stocky looking legs. GSDs have very similar legs and shoulder features however the legs again are generally shorter looking. Smaller Wolfdog candidates can pose difficulty with leg evaluation.

Pasterns/Wrists

The wolf has a long Pastern. This is commonly referred to as the wrist. However it encompasses more than just the joint. The Pastern starts at the joint and continues to the foot. It should be at a 45 degree angle from the foreleg toward the head. It should angle slightly outward away from the body. This should be able to move not only front to back but from side to side similar to our own. A GSD will have similar pasterns however the breed standard does not favor them turning outward of the body. Out of standard GSD’s can have near identical pasterns. Most Sled Dogs have shorter and straighter pasterns.

Feet
A wolf has a very unique foot. It is large, long and turned slightly outward with the wrist. The toes should be long, arched, and the middle ones should be close together. The feet should have webbing that extends at least ½ the length of the toe. The toenails should be black or dark colored. In Arctic or Arctic mixes the toenails can be taupe colored. There should be dew claws on the front feet only. Most Huskies & GSDs will have small feet in proportion to their body. Malamutes will have similar large looking feet. GSDs will have black or dark colored nails. Most Sled Dogs have white or clear nails (clear nails look pink) and rear dew claws. Many Water or Gun dogs will have large webbing between the toes.

Wolf Feet

AKC Siberian Husky Foot

Back

A wolf has a long and flexible back. It should have a slight taper (between .5”-1.5”) from shoulders to tail. It should appear narrow when viewed from the top. Most Sled Dogs will have a shorter back that is wider when viewed from the top. American GSDs generally have an extreme slope from front to rear (2.5”+).

Wolf Back

AKC GSD Back
**Hindquarters**

The wolf will have muscular streamlined thighs. The Femur should set at a 45 degree angle toward the head and a 90 degree angle from the hip joint. The Tibia should form a 90 degree angle then toward the rear of the body. The hocks should be parallel when standing. This gives the wolf’s hindquarters a well angled appearance. Most Sled Dogs will have much straighter appearing hindquarters. Most American GSDs will have extremely angled and articulated hindquarters appearing very short.

![Wolf Hindquarters](image1.jpg)  
 ![AKC Alaskan Malamute Hindquarters](image2.jpg)

**Tail**

The tail of the wolf should have a bushy appearance. It should be log shaped, well furred, and straight when at rest. The last bone should end at or slightly above the hock joint. Many sled dogs have similar looking tails at rest. However most Sled Dog tails are carried or curled over the back. Many Sled Dogs also have a white tipped tail. Tip color should not exclude the tail completely from being wolf. White tipped tails on a candidate does show the presence of dog but falls more under the coat and coloration category. If the tail only has the fault of the white tip, it should be categorized as wolf unless no other dog features have been found at the end of the process. GSDs generally have a longer tail with a slight curve outward. It will also have a smooth appearance instead of bushy. King Shepherds have a similar tail to the wolf but again is longer with a slight curve. Other dog features are sickle tail, ring tail, plume tail, and saber tail.
The coat of a wolf will be thick. It will consist of coarse outer guard hairs that are not soft, (unless recently washed) wavy, or curly. Underneath the guard hairs is a thick undercoat that appears wooly. The skin should be difficult to find. The coat should be very thick around the neck commonly referred to as the mane or ruff. Coat length can vary but should not be long enough to droop or flow during movement. Many Sled Dogs and King Shepherds will have a similar coat. Some Malamutes bred out of standard or Wooly Malamutes will have a wavy or curly long coat. Collies also have a long flowing coat. GSDs and some other dogs will have a shorter to short coat appearing almost slick to the body.

Coloration

Coloration of a wolf can greatly vary. They can range from black through several shades of grey and sable all the way to pure white (not all whites are Arctic Wolves). Sables and grays should have a well blended coloration with a lighter undercoat. Guard hairs can be tri colored and give a grizzled appearance. Grays and some whites should have a visible English saddle (commonly referred to as a “V” or “cape”) slightly behind the shoulders.
Some Sled Dogs can have similar coloration. GSDs, some Sled Dogs, and other dog breeds can have non blended colors and splotches of color. When looking at a candidate, look for these splotches or non color blending. This is most visible in the face with widow’s peaks, white muzzles going into black or red faces with no blending, and non blended white spots above and around the eyes. Refer back to the face category if this was missed the first time.

Wolf Coloration (Grey)  
AKC Alaskan Malamute Coloration (Grey)

**Walk & Movement**

The wolf has a very unique walk. It should appear very fluid. The hind legs should swing in the line as the front and the rear feet should land in or very near the spot the front foot has landed. This almost gives the appearance that the animal has traveled only on two legs in snow or mud (commonly referred to as single tracking). During walking or running the neck should be lowered near level of the back making the head and profile fairly low. The steps during walk should be fairly short (approx 3”-5” depending on the size of the wolf). The back and top line should remain steady with no bounce. Viewed from the top the back should sway in an “S” formation changing sides with each step. During this walk the direction should be able to be changed quickly with a fluid effortless appearance. Many breeds of dog have a bouncing harsh looking walk. Most dogs will have 4 distinct foot prints with two inner and two outer. Some dogs must almost stop before being able to change direction sharply.
Wolf Walk/Trot  

AKC Siberian Husky Walk/Trot

Trot

Like the walk the wolf has a near identical trot. The reach is further, covering more ground with minimal steps. It again should appear fluid with a single track with practically no bounce. Again the wolf should be able to sharply change direction with a smooth effortless appearance. Like above many dogs have a very “bouncy trot”. Many dogs also give the appearance that the trot is not fluid and takes great effort. Many dogs cannot change direction sharply in the trot without nearly stopping. Pay close attention to the walk and trot when evaluating a candidate due to its importance. You may have to view it multiple times. If not evaluated correctly, these can incorrectly reduce content by 2 points or 10% of the scale.

Wolf SingleTracking

Final Figures

Add both columns to get your final figures. Apply the wolf figures based on the 4 level Content Scale mentioned above. These contents and figures should apply to the scale as follows: 1-2 wolf features = No Content. Many breeds of dog used wolf in their conception and therefore can and will show some wolf features. 3-9 wolf features = Low Content. Again since several dog breeds display their own wolf features this group has more numbers in it to account for that. 10-15 wolf features = Mid Content. 15-19 wolf features = High Content. A score of perfect 20 is most likely a pure wolf or such a high content that it cannot be physically determined from pure.

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