

# Spot On! Nomenclature of the Spotted Llama

By Dan Powell Photos provided by Grand Harvest Llama Company

**L**lamas exist in a fantastic spectrum of colors and patterns, the likes of which is unknown in other livestock species. Llama breeders have long been mixing and matching every conceivable color combination in their pursuit of that ever elusive slot machine ‘win’. But, at each turn – and much to their frustration – they produce as many white or brown cria as they do appaloosa or paint cria. Contrary to popular opinion, the genes that govern spotting in llamas really are behaving in a rather predictable – albeit inexact – manner. But, before any serious discussion of color genetics can begin, we must all be speaking the same language.

First off, spotting genes do not create colored spots on a white animal, but rather the reverse. Spotting genes inhibit normal pigment production or its distribution and result in areas of the fur coat and skin that lack normal pigmentation. There are many different spotting genes, but they all transform a solid colored animal – black, bay, red, fawn, and so on – into an animal that has patches of white or dilute interspersed throughout its base color. A llama’s base color is determined by a plethora of

genes that are inherited independently of spotting genes. The spotting genes merely map out where on the animal that base color is not deposited. Each specific spotting gene creates a distinct and identifiable pattern: tuxedo, pinto, piebald, speckled, appaloosa, tricolor and so on.

The confusion with spotting, therefore, has little to do with the actual spotting genes themselves – as they behave in a relatively predictable manner. Rather, the real source of the confusion lies in the nomenclature breeders use in referring to spotted llamas. For example: Tuxedo, pinto, and piebald animals are commonly lumped together and referred to as ‘paints.’ Likewise, piebald, speckled, appaloosa, and tricolor llamas are collectively referred to as ‘appaloosas’ – and just as often tricolors bear the moniker ‘reverse appy’ and piebald animals are called ‘whites.’

## *Tuxedo*

Okay, let’s start at the easiest end of the spotting gene spectrum – the ‘tuxedo’ color pattern. In this case the name is quite descriptive and accurate. Typically, this is a solid colored llama with a white blaze and some degree of a white extending down the front of the

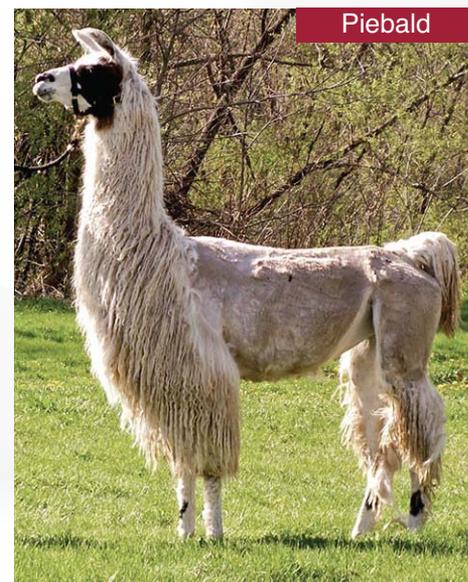
throat. This animal also usually has white socks. As with all the spotting genes there may be variations on this theme. As an example, some ‘tuxedo’ animals may only show white socks or even a single white leg. Regardless of the exact pattern, the remainder of the animal may be any color from fawn to black. Of the spotting genes, this one is noted for producing animals with the least amount of white.

## *Pinto*

These are what the industry most commonly refers to as ‘paints’. These animals typically have white encircling the neck and have legs that are primarily white. The white spotting may or may not extend into the shoulders, lower blanket and face, but generally the pattern is a colored blanket or saddle and tail, and a colored face that is often segmented in two by a white blaze. This spotting gene may create a ‘blue eye’ if the white spotting overlaps the eye socket. Again, the remainder of the animal may be any color from fawn to black.

## *Piebald*

I am known for my herd of pure white llamas, and piebald is usually what I find when people tell me that they have a ‘white llama’ in which I might be interested. Piebald is the ‘most white’ of the spotting genes. These animals are at first glance white, but upon closer inspection reveal dark pigment in the tail, feet, and head. It is not uncommon for piebald animals to have the occasional apple sized spot of color



randomly placed throughout the body. Because of the dark tail and small spots on the face, and the occasional body spot, these animals are sometimes believed to be good candidates for appaloosa production but, in my experience, nothing could be further from the truth.

**Speckled**

Speckled animals show an even distribution of grapefruit sized white spots throughout their entire body. They tend to be so spattered with white spots that they appear to be white animals speckled with a smattering of dark apple sized spots, but in truth they are not. Again, the base color may be red or bay or silver or black or whatever, but what distinguishes the speckled llama is that the spots are quite uniform and are regularly spaced throughout the entire body. This color is usually referred to as ‘appaloosa’ but it behaves quite differently from true appaloosa. Some rather famous argentine llamas bear the distinction of being ‘speckled’ and this color actually is well established in suri llamas as well. Unlike the appaloosa which we will discuss next, the speckled llama looks to be a white animal covered with an even distribution of monochromatic spots: white with red spots, white with fawn spots, white with gray spots, and so on.

**The Appaloosa**

When I visit a breeder of appaloosa llamas I invariably am introduced to a herd of pinto, speckled and appaloosa

animals. But, the appaloosa is not merely a colored llama with some pattern of white splashed about it – as are all the aforementioned colorations. While this coloration is indeed about removing color, it does so in a different way. In these animals the base color is no longer evenly dispersed, but is concentrated into dark plum-sized spots – but leaving enough pigment in the background color to make it appear roan or marbled.

Like the speckled llama, this animal is more or less monochromatic in appearance. There is usually a fair degree of white flecking associated with this color pattern as well – though it is primarily restricted to darker pigmented areas like the face and legs. Depending on the base color genetics, these animals are generally fawn with red spots, rose-brown with dark bay spots, or grey with black spots, and so on – and all with white flecking in the darker areas.

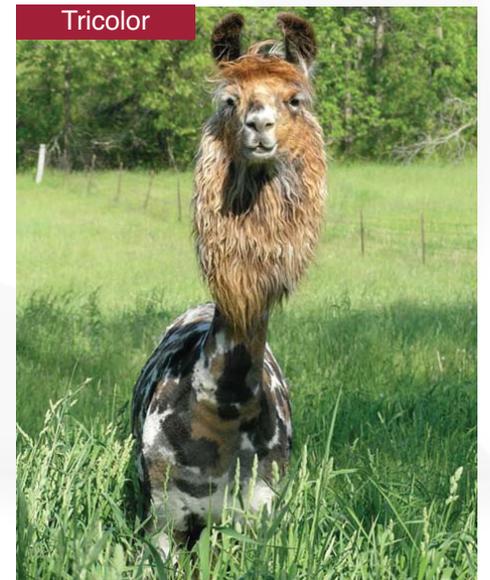
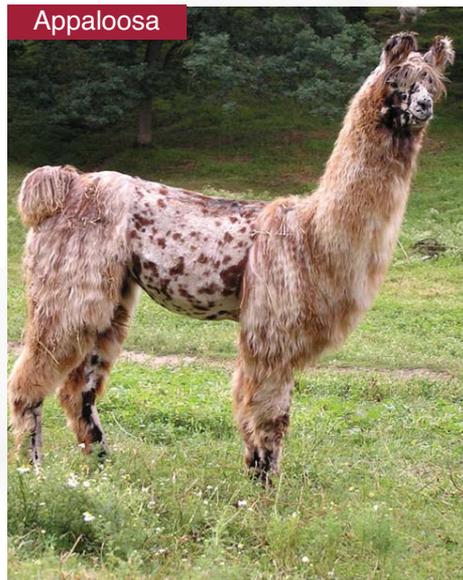
**The Tricolor**

The tricolored llama represents the holy grail of llama color craziness. Indeed, to my knowledge, no other such color pattern exists in large ruminants. To me the phenotype is reminiscent of the merle coloration in canines, calico in cats, and tricolor in rabbits. It is as often referred as ‘reverse appaloosa’. The tricolor llama has not read the rule book when it comes to ‘what can and can’t be done’ in terms of color genetics. Generally it takes a solid colored animal and sets loose with a whole crazy patchwork of blotches in every hue and size. A tricolored llama may have spots

of intense red that overlap blotches of black which are themselves alongside spots of white and gray. What distinguishes this color from the appaloosa pattern is that its blanket shows distinct blotches of both intense red and true black that are evenly dispersed, commonly side by side, and often seen set against a background of steely gray. The tricolored animal truly is a rainbow beast.

Where a keen eye and proper nomenclature becomes most critical is in the pairing of spotted animals. If you combine the speckled and appaloosa genes (both of which remove color) the subtractive effect often results in a white llama or what has come to be known as the ever saleable ‘dilute appy.’ So too combining pinto and piebald or piebald and speckled may produce a white llama. Some spotting gene combinations are quite lovely and quite common, like a speckled pinto or an appaloosa pinto. In these two color patterns the usual solid blanket of the pinto is replaced by either an appaloosa or speckled pattern.

Another point that bears mentioning is that the odd white spot on an otherwise solid colored animal does not confirm that an animal is a carrier of pinto or piebald. More likely these tiny spots are merely transcription errors or are the result of follicle damage. Lastly, there are many animals that have guanaco markings with dark flecks and dark plum-sized spots on the lighter underbelly and inside legs. These spots do not denote a ‘carrier of appaloosa genetics’ but, rather, are more likely



variations of the wild type or shaded coloration.

At One Earth Farm we are known for our herd of pure white llamas, and it has been the pursuit of the dominant white allele at the agouti locus that has helped me to understand all of the mishmash whites that have been created via the mixing of the various spotting genes. The struggle with spotting genes is that they interact with each other as well as with the base color genetics of the animal. As more research is done it will likely be discovered that some of the above color patterns are merely the result of a single spotting gene acting in concert with pigment genes and modifier genes at different loci. But a brief and telling look into an animal's pedigree will help breeders decipher with which color pattern they are actually dealing. Only by accurately identifying color patterns, and pairing animals appropriately, can a breeder of pintos or appaloosas begin to get consistent results - and it is consistent production that is the hallmark of every good breeder.



### ***About the Author***

*Daniel Powell, owner and operator of One Earth Farm, has had a passion for animal and plant breeding since the age of eight. While much of his technical training in genetics was obtained while pursuing his Bachelor's in Genetics and Cell Biology, he credits his lifelong hobby and study of breed development and preservation for the bulk of his understanding. Dan has written extensively on the importance of sound breeding practices for the future of the llama industry. His articles have been published in Llama Banner, Llama Life II, Camelid Quarterly, Suri Llama Magazine and the Argentine Llama Aficionados Newsletter. Dan may be contacted by email at [dan@oneearthfarm.com](mailto:dan@oneearthfarm.com)*