

Snowcap Pattern

APPLIED APPALOOSA

COLOR GENETICS

Part III: The Snowcap pattern

By Robert Lapp and Gene Carr

Snowcap—did you ever wonder how the word found its way to the Appaloosa?

Webster's description provides some clues: "snowcap—a cap of snow; having the top covered with snow, as on a mountain."

Top covered with snow—that's pretty close to how we might describe an Appaloosa pattern—top of the back/hip, all white, as if covered with a blanket of snow.

If you and Appaloosas go back to the 1950s or '60s, you might have heard Hall of Fame breeders Lane Hudson and Dick Stanger use "snowcap" to describe some Appaloosas. You might even have heard that Carl Miles once described Prince Plaudit as a snowcap. Or remember very old Appaloosas from our past with names like Snowcap Toby Too, Chico's Snowcap, Snowcap Babe, Johnny Snowcap and Snowcap Warrior. And as you might expect, one old-time Appaloosa was actually named Snowcap.

But some old horses had the name yet not the pattern, and had spots in their blankets or were roans having an ancestor whose name included the word "snowcap." In Prince Plaudit's case, he was a leopard, but with so few spots on his hindquarters that he might have been incorrectly described as a snowcap leopard.

WHAT QUESTIONS REMAIN?

The word "snowcap" has been part of the Appaloosa vocabulary for many years. Old-timers tell us that snowcaps producing nearly 100 percent color were common knowledge among some breeders, long before our 1998 article equated snowcap with homozygosity.

The infamous Top Quest, foaled in 1968 (see photo A) and regarded by some in those days as a snowcap, was advertised as a 100 percent color producer even though the word "snowcap" didn't appear in his ads. Maybe identifying him as a snowcap didn't matter back then, or perhaps his owners weren't sure. At any rate, Top Quest met all the basic snowcap requirements and was homozygous for producing color.

If snowcap has such a long history in the Appaloosa community, why are we still talking about it? We wrote about it in 1998. Most people now know it's an Appaloosa coat pattern representing the genetic make-up required for homozygosity and nearly 100 percent color production. What's not clear? What questions remain?

SUPPORTING STORIES

Several true stories begin to answer those questions. We'll relate these stories as if they were happening all over again.

It's still winter, but you're getting ready for the breeding season. Thumb-ing through the *Journal*, looking at stallions for your mare, you see a very nice-looking young stud (see photo B). He's bred in purple, stood junior grand champion many times, produced 100 percent color his first foal crop, and appears to be a snowcap: no spots and a clean white blanket.

Now you're excited. He should cross well on your mare, produce a halter baby that should ride, and you'd get color. You look closer at his pedigree, do a double-take, and then it hits you: You know about snowcaps. They're supposed to have two Appaloosa parents, a pure white blanket at least over the hips, and no spots in the blanket. The stallion sure looks like a snowcap, but he's got a Quarter Horse sire.

You think to yourself, *This isn't supposed to happen*, and then remember reading a discussion about snowcaps on the Internet in which someone described an Appaloosa with a huge white blanket, no spots anywhere, no roaning on the solid-colored front part of the body, and absolutely dismal color production. He also had a Quarter Horse parent. The message ended with the comment, "I don't know how anyone would know he's not homozygous based on his coat pattern. If we want to educate people about homozygous coat patterns, we need to include 'may be homozygous every time we use the term snowcap.'"



Photo A



Photo B



Photo C

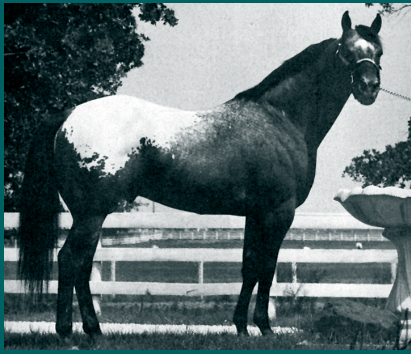


Photo D

Defining the terms

Different forms of a gene (for example, dominant and recessive) are referred to as alleles. Dominant alleles are referred to with capital letters (for example, “A”); recessive alleles are referred to with lower-case letters (for example, “a”). Every horse receives one allele for each trait from each of its parents.

- Homozygous**—Both of the horse’s alleles are the same (for example, AA or aa)
- Heterozygous**—The horse possesses a different allele from each parent (for example, Aa).
- Phenotype**—A horse’s visual appearance
- Genotype**—A horse’s genetic formula (DNA)

Breeding results

Each parent passes one allele of a given trait to its offspring. Breedings of various genotypes can produce the following results for any particular trait. (Note that both AA and aa are homozygous, but each would produce a different phenotype.)

| | Sire | | |
|----|---------------------------|--------------------------------|----------------------------|
| | AA Homozygous dominant | Aa Heterozygous | aa Homozygous recessive |
| AA | AA (100%) | AA (50%) or Aa (50%) | Aa (100%) |
| Aa | AA (50%) or Aa (50%) | AA (25%), Aa (50%) or aa (25%) | Aa (50%) or aa (50%) |
| aa | Aa (100%) | Aa (50%) or aa (50%) | aa (100%) |



Photo E

D
a
m



Photo F

IMPORTANT QUESTIONS

You thought you knew snowcaps, but the picture of that crossbred snowcap and what you read on the Internet raise some red flags. That’s why we’re revisiting the snowcap pattern. Some continue to wonder if it really indicates homozygosity for producing color, and raise important questions:

- How do we know when we’ve identified the pattern correctly?
- How can we explain what appears to be a snowcap, but is really the product of a crossbreeding?
- Do all snowcaps exhibit the same basic pattern or are there significant variations seen?

Good questions still linger and deserve answers, for we’re acutely aware of what

one old-timer said about Appaloosa genetics many years ago: “Unless one is very careful, Appaloosas will make a liar out of a person.”

We endeavor to be careful throughout all our research and writing.

BASIC REQUIREMENTS AND VARIATIONS

The snowcap is an Appaloosa with two Appaloosa parents and a pure white blanket, generally extending from near the withers to back over the loin and hips. While large white blankets are common, some snowcaps have much smaller white blankets covering only the loin and part of the hip.

Snowcaps are born with a pure white blanket. An Appaloosa cannot “roan into”

and become a snowcap, although the solid areas on most snowcaps do roan.

Snowcaps with a large white blanket may produce foals with minimal color while those with smaller blankets may produce abundant color contrast.

Snowcaps will produce foals with color or characteristics nearly 100 percent of the time. “Nearly” acknowledges that 5 to 10 percent of foals may be born solid-colored with no visible characteristics. We have yet to find examples where such foals did not “color up,” often as varnish roans. Sometimes, these foals aren’t advanced to regular registration (#), thus still showing up on production records as “N” or non-characteristic.

Many snowcaps are easily identified and exhibit what we call the classic phenotype or visual expression (see photo C). Some patterns are smaller (see Photo D) and don’t cover as much of the hip or hindquarter.

Other expressions have dark markings—what we call splotches—usually scattered lower down on the hip and around the hindquarter (see photo E).

Light-colored Appaloosas may not exhibit a clearly defined blanket (see photo F) but are snowcaps nevertheless. Other snowcaps have a white blanket but with significant roaning around the edges (see photo G). One variation is so extreme that one might wonder if it’s a snowcap at all (see photos H and I, both sides of the same horse).

DEFINING CHARACTERISTICS

Regardless of the degree of variation from the classic pattern, a legitimate snowcap may exhibit the following phenotypic, or visual, characteristics:

- A pure white blanket. Size and placement over the body may vary as shown in the photos.
- Solid dark areas or roaning covering the head, neck, shoulders, and usually extending back past the withers and heart girth to the middle of the barrel
- Irregularly shaped dark markings—splotch marks—generally found on the

lower hip and/or hindquarter

- Few, if any, small spots, usually found lower down on the hip or very close to the withers.

ANOMALIES

We’re aware of crossbred foals that clearly appear to be snowcaps (see Photo B) and invariably raise obvious questions:

- Is the pedigree correct?
- Does the crossbred parent exhibit any Appaloosa characteristics?
- Have the parents and foal been blood-typed and/or DNA’d?
- Are known Appaloosas somewhere back in the crossbred pedigree?

(Note: some Quarter Horses do in fact have known Appaloosas back in their pedigrees. In these specific cases, current genetic knowledge argues that Appaloosa genes aren’t recessive to the point of skipping generations without being visually expressed by each subsequent animal. Our research on non-characteristic animals with leopard breeding clearly raises questions about that “current genetic knowledge.”)

While we continue to research these anomalies, we’ve found that a crossbred “snowcap” is eventually proven to be heterozygous, despite producing 100 percent colored foals in a first foal crop.

FINAL THOUGHTS

Like most Appaloosa patterns, few expressions of the snowcap pattern are so similar or obvious that no questions will arise, especially when the stallion or mare has no production record or only a limited number of foals.

While pedigree examination, live observation, or good pictures may assist in identifying the pattern, sometimes an evaluation is so inconclusive that any judgment is a close call.

In such cases, as with a medical diagnosis, seeking second and third opinions is probably warranted.

Editor’s note: Next month—the fewcap Appaloosa pattern. 🐾



Photo G



Photo H



Photo I