What You See Isn’t Always What You Get!
Suri bred to Suri = Huacaya

By Bill Graham
My growing concerns over the suri alpaca breed has lead me into a much debated issue in the industry. That being the cross breeding of Suris with huacayas. As many of you know this is not a new practice. Through-out South America, Australia, and in the U.S cross breeding is happening. The practice was used widely in Peru during the importation days in order to ship colored Suris to the U.S. for big dollars. The American market wanted color and as long as the alpaca was suri phenotype and registered suri it was alright. This seemed all fine and many breeders with-out really understanding how the genetics work bought into this program. This also applies to any importation where the **background of the suri was unknown!** I will talk about importation later in this article.

In short the Peruvian suri population was largely white and by breeding suri males to colored huacaya females the colored suri population exploded. But what we were getting was a suri alpaca that wasn’t a true homozygous suri. What has been discovered is that the suri inheritance pattern clearly follows a single gene dominant pattern over the huacaya gene. There is also plenty of anecdotal evidence from suri breeders to support this now known fact. This article should help you understand how to determine or at least let you figure out how to do homework to decide if your Suris are homozygous or heterozygous.

But first let’s show you how it works

Alpacas all fall into three groups:  
- **ss**=huacaya  
- **Ss**=heterozygous suri (carries a huacaya gene)  
- **SS**=homozygous suri (pure)

Because the suri gene is dominant if you breed a pure suri male (SS) to 100 huacaya females (ss) you will have 100% suri offspring and they would all be heterozygous **Ss** Suris. No matter what kind of alpaca you breed a pure suri male (SS) to whether suri or huacaya you will have a suri.

If you use heterozygous (Ss) Suri males to 100 huacaya females (ss) you will have 50% Suris offspring which will all be heterozygous (Ss) and 50% huacayas that are always homozygous huacayas (ss).

If you breed a heterozygous suri male (Ss) to 100 heterozygous suri female (Ss) you will end up with 50% heterozygous Suris (Ss) –25% homozygous Suris (SS) and 25 % huacayas which are always homozygous huacaya (ss).

Now if you use a homozygous (SS) suri male and breed it to a 100 heterozygous (Ss) females it would result in 50% homozygous (SS) Suris and 50% heterozygous (Ss) Suris. Once again all Suris because the male is pure suri.
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And finally if you breed a pure suri male to a pure suri female you will always get a homozygous suri offspring 100%.

What Kind Of Suri Do I Have?

Well that’s a question that can be answered but it takes some homework and maybe even some experimenting. First off let me share some of my homework and knowledge I have learned over the years. First off you CAN’T TELL BY LOOKING. Visual tells you nothing but the quality of the suri. I have seen first cross (F-1) Suris that have won grand championships in shows and ones that have a very poor intermediate fleece type. Remember a very high quality male really puts his stamp on his cria. We all have had that beat up old gal that when mated with a great male produces winner after winner.

It’s harder to tell if your female is SS or Ss because she isn’t having 100 crias. The only way to find out if she is SS is to breed your suri female eleven times to a huacaya male and if she produces 11 Suris she is probably pure suri SS. However no one would do that because she would be 12 to 15 years old before you would get the results to prove it and really, it doesn’t matter. Why you may ask? Well if she is bred to a homozygous SS male she will have a suri 100% of the time. If she ever has a huacaya it’s because she was bred to a male that is heterozygous (Ss) plain and simple. If you review the statistics above you will see that whatever female is bred whether a SS, Ss, or a huacaya as long as the male is SS you will have a suri. I stated earlier that many not just a few heterozygous Suris have won major shows after shows and that’s a FACT. If the judges at the show can’t tell my point is made YOU CAN’T TELL BY LOOKING.

Now learning if your male is homozygous is relatively easy in comparison. The easiest way and hard to swallow for some proud owners of champion suri herdsires is, has it ever sired a huacaya offspring. If the answer is yes, then it’s not pure suri. Breeding to this male puts you in 25% chance of having a huacaya offspring when bred to a suri female. Not only that, but it puts you into the 50% bracket that if you have a suri cria it will be heterozygous (Ss). If that’s the case any male from this herdsire has only a 25% chance of being homozygous (SS). Do you want to take a chance on using a male in your breeding program from this breeding? If the answer is yes then you should do the following to insure he is pure suri before you go out and market him as the next answer to all the suri queens’ dreams. BREED HIM TO 11 HUACAYA FEMALES. If he is homozygous he will produce 11 suri crias. If any huacayas are born he is not!

If you have a male and your not sure or don’t have the means to test him by breeding him to females you can go to the ARI website www.alpacaregistry.net. You have to be a member to access data inquiries but believe me this site answers a lot of questions. To find out about your males history start with having your registry on hand. Go to the members services section and click on perform data base inquiries. You can find offspring on any registered alpaca. If you
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want to check your alpaca type in the ARI # and hit enter. This will give you his complete listing of his registered offspring. You can go to his sire and do the same. If his sire has had any huacayas registered they will show up which means he is heterozygous and you know that your male has a chance of being heterozygous. But beware if a highly prized herdsire had a huacaya the owner may not ever register it to keep up the value of their prized male. I would hope this wouldn’t happen but realize the dollars invested in some of these males and what the breeding value goes to if they have had huacayas. Now I’m not saying this male is worthless and by all means will produce incredible Suris all I’m saying is that you will be taking risk of diluting your suri herds purity by breeding to a heterozygous male and any male from this male will possibly create the same scenario for your breeding program.

I’ve found that too many breeders are too anxious to capitalize on their suri herdsires without really taking the necessary steps to insure what they offer is the real deal. We sometimes pay way too much for breeding males just because they won an award or have the look. At best it’s a crap shoot or a roll of the dice on what the outcome may be. We as breeders should follow the practices of trying to perfect the breed if that’s what we want instead of playing hide and seek about what our HERDSIRES HAVE PRODUCED.

The reason I started trying to understand why Suris produced huacayas goes back to the early days when I got into alpacas. My wife at the time and I started with Chilean Huacayas which was all they had in the U.S.A. In fact there was only 240 in the country when we started. There were no Suris registered but I had my doubts about some of the alpacas thinking they maybe were Suris. She decided that when the first importation of a handful of Suris were imported to the country that she wanted to buy some, so she did. We had nothing but Suris offspring but had heard that some of the pregnant Suris had huacayas born and back then there wasn’t any real explanation we just accepted it. Several years later we participated in the first importation from Peru which was both Suris and huacayas and we first learned about Don Julio Barreda and his Accoyo Ranch. When we attended the event in Michigan we were absolutely astonished at the quality we were seeing. It was at that event when we first really understood and could see what a well managed breeding program could produce. Fortunately we were awarded the first, third and fifth picks of the males and ended up with great suri males. There was only one colored suri male as I recall so we picked him first. We never had a huacaya from any of the Accoyo males. Out of our 3 picks, these Accoyo herdsires have sired 323 off spring ALL SURIS!

I also have looked to see how many other major herdsires from this group fared and chose 3 other Accoyo herdsires chosen at this importation sale. They have had a total of 317 offspring once again all Suris. Out of 640 crias not one huacaya! THESE MALES ARE PURE SURIS (HOMOZYGOUS). Don Julio Barreda dedicated his breeding practices to purifying the breed and shared his decades of elite breeding with the U.S... His approach was to cull out the heterozygous males until he had purified his breeding foundation herd. However I have done extensive research on the suri males in the US and have discovered at least 2 Accoyo males who
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are heterozygous so even Don Julio’s Herd wasn’t absolute. If anyone tells you they have only pure Suris I would be very skeptical. There is no way with such a short time in America and the unknown pedigrees of many of the imports that one could make this claim with certainty.

There have been numerous importations since the original Peruvian Importation and lots of great alpacas as well as lots of questionable ones have come to America. It’s our job as breeders if we want to achieve a pure suri breed to start thinking about the long term effects and not be so concerned about the short term profits.

Many breeders raising Suris don’t have enough females to test their males before they start using them as breeders. There is no easy solution. Since we are dealing with a lot of dollars in this industry we sometimes feel the urgency to breed with what’s ever available. The only real solution to help clean up the suri breed as a whole is to test the males before you use them with huacayas or geld the heterozygous males when they produce a huacaya with a suri female or huacaya female. I can’t tell you enough times HOMOZYGOUS SURI MALES PRODUCE SURI OFFSPRING! EVERY TIME

Female Suris also contribute to the formula. I would venture to say, and this is just a guess, that at least 75% of the female Suris in America are heterozygous. This means that every time they are bred to a pure homozygous male they will produce a suri but its cria could also be heterozygous. You have a 25% chance that it is heterozygous but you increase the chance of that offspring to 75% of being a homozygous suri... At least we are heading in the right direction with these kinds of mating. So here is a chart of female breedings to a pure homozygous male. Let’s hope everyone will breed with these kinds of males!!!

PURE SURI HOMOZYGOUS MALE
BRED TO THE FOLLOWIG

HUACAYA FEMALE--100% SURI OFFSPRING—100% HETEROZYGOUS (Ss)
THESE ALPACAS ARE CALLED F-1 (FIRST CROSS)
NEVER USE A MALE FROM THIS BREEDING GELD IT!!!!!
THE FEMALE F-1’S HAVE A BAD RAP IN THE INDUSTRY, WHICH IS UNFAIR,
BECAUSE THEY ARE NO DIFFERENT THAN ANY OTHER SURI FEMALE THAT IS
HETEROZYGOUS EVEN IF IT’S 10 GENERATIONS DEEP OR OF UNKNOWN
FAMILY HISTORY. EITHER YOUR PURE OR HETEROZYGOUS THERE IS NO IN
BETWEEN.

HETEROZYGOUS (Ss) SURI FEMALE----100% SURI OFFSPRING---50%
HETEROZGOUS (Ss) AND 50% HOMOZYGOUS (SS)
MALES HAVE A 50% CHANCE OF BEING PURE AND SHOULD BE BRED 11 Different
HUACAYAS IF YOU WANT TO FIND OUT OR JUST GELD THEM.
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FEMALES STAND A 50% CHANCE OF BEING HETEROZYGOUS (Ss) AND A 50% CHANCE OF BEING A PURE HOMOZYGOUS (SS) SURI.

HOMOZYGOUS (SS) SURI FEMALE----100% SURI OFFSPRING---100% HOMOZYGOUS
YOU HAVE A PURE SURI FEMALE AND THESE ALPACAS SHOULD NEVER GET BRED TO AN UNKNOWN MALE or HETEROZYGOUS MALE

From these pictures you can clearly see that WHAT YOU SEE ISN’T ALWAYS WHAT YOU GET!

F-1 SURI FEMALE FROM HUACAYA
SHE EXHIBITS GREAT PENCILED FIBER AND DENSITY

BC-1 SURI FEMALE –HUACAYA GRANDMOTHER
VERY ROBUST GREAT LOCKS AND SUPER DENSE FLEECE

In conclusion the Suri alpaca is a beautiful rare breed and with your help we could become the leaders in the world market. It will take time, effort, and most of all educating ourselves on what we are breeding. Every time we breed with a heterozygous male we are going backwards no matter what the cria looks like. I also realize nobody is going to cull females and as long as they are bred to pure males it’s only a matter of time before the problem takes care of itself. When we have enough pure males and the older heterozygous females start passing away our herds should become even more pure. Only by finding homozygous males to breed with will we be heading in the right direction. There are enough of them out there and with proper breeding we will only strengthen the pool to choose from. I hope this helps your decision making when it comes time to breed your suri females. Do your homework find out about the male your breeding to and don’t be afraid to demand disclosure to find out if the male has ever sired a huacaya. You owe it to your breeding program.

There is work being done at the present time by Professor D. Andrew Merriwether, Ph.D. at Binghamton University who is mapping the suri gene. The following is an email I received, and with his permission have included it in my article. Any participation in his project could
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open the doors to faster understanding of the suri gene and maybe to determining in the near future if our Suris are homozygous or heterozygous without crossbreeding but by blood samples. Wouldn’t that be nice!!!!

Thanks for agreeing to participate in my Suri Allele Mapping project. I’m in the first year of a three year study. I need extended pedigrees of Suris and huacayas, minimally Dam, Sire and cria, then plus any blood relatives. Top need is huacayas and suris out of Huacaya-Suri crosses, then huacayas out of suri-suri crosses, then homozygous suris, and suri-suri crosses. I can use alpacas and llamas for this study. I need ARI numbers for my database. If they don’t exist, ARI numbers of the parents of the cria. Llama registry numbers for the llamas. I can do it without the numbers, but it is much better with them. All of this is strictly confidential. All samples will be assigned new lab IDs for internal use and no one outside of my lab will ever see the individual data. The summary results will of course be published. The bigger the pedigrees the better. What I need to know for each animal is as follows name, species, type(H or S), color and secondary colors and pattern, if it is a known heterozygote or believed homozygote (and why you believe it to be homozygous), ARI number (or the ARI of the dam and sire if the cria does not have an ARI). Please draw 1-6mls of blood into a lavender top (EDTA) vacutainer and Mail it overnight to me with a cold pack to:

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Thanks and I hope this helps you understand why we don’t always get what we think when breeding Suris.

Bill Graham