

SKIN BIOPSIES – A BREEDER’S PERSPECTIVE

In order for Suri growers to maximize the annual yield from shearing, skin biopsies must be used in making breeding decisions. This data will allow breeders to increase density while narrowing micron, and possibly increasing annual staple length – the latter allowing growers to shear twice a year and generate more income from each animal. To understand the big picture on what biopsies tell us, consider a square, one millimeter by one millimeter. Then consider a series of round fibers fitting into that square. How do you fit more round fibers into that square? There are only a few options – reduce the width of each fiber, reduce the difference in micron between the secondary and primary fibers, and/or increase the number of secondary fibers as those are always a lower micron. By making these your goals, you will increase density over time, and while your weight may stay the same (finer fiber weighs less), you will now have more consistent, and more valuable fiber for the same weight. The following gives greater insight into each of the pieces of data that biopsies provide.

BIOPSY DATA

First of all, a skin biopsy gives you much more information than the density of the fleece. It gives you information about the fineness, the handle, and the uniformity of the fiber – all things that are highly valued in the commercial fiber market. By having all of this great information on hand, you can begin to take control of your breeding program without a “hit and miss” approach.

The following information is provided regardless of which service you use for your biopsies:

Secondary to Primary Ratio (S/P) – this is a ratio that you will see mentioned by breeders who run biopsies and it is an important piece of information. Primary fibers grow out of the skin as a protective coating against the elements. They are generally higher in micron, and they can influence the handle of the fiber. The secondary fibers in a cluster are those that grow around a group of three primary fibers and they are generally softer, and there are more of them. The higher the ratio of secondaries to primaries, the finer the overall fleece. For Suris, it is generally thought that a ratio of 10:1 or better is desirable. Fineness is thought to be 70% of the value of a bale of fiber in the commercial market.

Micron spread between the Primary and Secondary Fibers – This goes hand-in-hand with the S/P ratio above. The ideal would be to have the primaries the same micron width as the secondaries, but a spread of five microns or less is thought to be exceptional. A significant difference in the spread between primaries and secondaries will lessen the handle of the fleece, and also impact processing and the quality of the end product. The North American Suri Company reduces the grade of the fleece by 1-2 categories when large primaries are found in an otherwise fine fleece.

As you run your hand down the neck of your Suri next time, it may feel soft and fine. But if your animal's primary fibers have a significantly higher micron count than the secondaries, you will feel something that just isn't quite right – almost like sand in the fiber that distracts from the fineness you are feeling otherwise. It will make no difference that you have a fabulous histogram on this animal because of all the great secondaries your animal produces – if the micron spread is wide, the handle will suffer.

And the reverse can be true as well – we have an older girl who runs 28 microns on her histogram, and she has a very low S/P ratio, but the spread between her secondaries and primaries is only five microns, which is considered highly desirable. The result is that her fiber feels relatively soft – the uniformity of her primaries and secondaries actually improves the handle on this girl's fleece!

From the standpoint of the commercial fiber market, a significant difference between these types of fibers will have a negative outcome in two ways. First, lack of uniformity in micron always downgrades the value of a bale. Secondly, fiber spins differently depending on the micron level. If you have a group of secondaries at 20 microns, and a group of primaries at 30 microns, the machinery will process at some average of the two, but the results will be less than adequate for either micron level (too much twist for the primaries and too little twist for the secondaries), resulting in poor handle and durability of the end garment.

And now we come to *Density!* This is of course the measurement that everyone associates with skin biopsies and it is the measurement that most often surprises breeders receiving their results. Why? Well, because there are so many variables that can throw off the hand when trying to determine density by simply feeling the fiber:

- *Micron levels between animals* – if you have one animal that is 20 microns, and another that is 25 microns, the 25 micron animal is probably going to feel more dense because the fibers are wider and stiffer. So, unless you are comparing two animals with the same MFD and SD, you are not going to be able to do a fair comparison.
- *Weight* – a fleece with higher micron and/or longer staple length is going to weigh more than a similarly dense animal with lower micron and/or staple length. If you try to use weight alone to determine density, you are likely to get it wrong.
- *Wide spread between secondaries and primaries* – again, those higher micron fibers in the fleece are going to give the hand the sensation of greater density.

Additionally, when feeling by hand, the best we could hope to do would be to determine which of our own animals is the densest. However, with a skin biopsy, you will know where your animal stacks up relative to a much larger pool.

The importance of density cannot be over stated because it impacts so many other factors in the fleece. Of course, the greater the density, the greater the dollars back per animal fleece. However, research has also proven that with increased density comes greater fineness, and greater organization of lock, which means little to no cotting.

The significance of density as relates to lock organization cannot be overlooked. Poor organization of locks creates cotting. And cotting creates a significant devaluation of the fiber in the commercial market. Cotting occurs when fibers grow at odd angles from the skin, thereby crossing over one another and becoming entangled. Once the fibers do cross over and tangle, they will break, creating “shorts” in the fiber, leading to shedding in the yarn, significant fiber loss while processing, and overall poor durability of the yarn. Contrary to popular belief, cotting does not occur because an animal is dense, nor does it occur because an animal is fine. At The North American Suri Company, we come across many fleeces that are 30+ microns that are cotted throughout the fleece. Those are animals that should be culled from your breeding program

WHAT BIOPSIES ARE NOT

Well, now that you are thinking about running that first biopsy, it is important to raise two cautionary points. First, biopsy results are not a promise that the offspring from the sire and dam will inherit all the positive traits of each. By themselves, biopsy results simply give each breeder a better and more objective roadmap to matching males and females. Heritability is determined by EPDs, and while one day skin biopsy information may be part of the EPD measurements, for now it is not. So, it is incumbent upon each farm to secure biopsies from each of your offspring to determine your own results for heritability.

Secondly, alpacas are known for their lack of uniformity across the blanket. And a skin biopsy is only taken from one small spot on one side of the animal. As such, each breeder must use common sense when interpreting the results.

CONCLUSION

While skin biopsies are not the “end all, be all” of better breeding practices, they do provide a wealth of information that can be used to improve one’s breeding program. As our industry moves forward and fiber becomes an ever more important part of the picture, making smart breeding decisions to improve our national fiber clip will become more and more important. Biopsies are a great tool to help make those smart decisions.