HISTOGRAMS – HOW TO USE THEM AND WHAT THEY MEAN

If you haven't used any kind of scientific analysis before on your fiber, we think running histograms is a great way to start – they are inexpensive and provide you with important information that can guide you in making next year's breeding decisions.

Key Definitions

Average Fiber Diameter (AFD) or Mean Fiber Diameter (MFD) – This is the average micron measurement of all the fibers you submit. Typically, you are submitting a sample size that is approximately two inches in width, and there are typically 2,000 or more fibers in that sample.

Standard Deviation (SD) – this tells us the range of microns for 66 2/3% of your sample. So, if you have an AFD of 20 microns, and an SD of 4, this means that 1/3 of your fibers range from 20-24 microns, and another 1/3 range from 16-20 microns. The remaining third falls on either side of 16 and 24. Depending on how well your range forms a bell curve, this remaining one third may skew the shape of the curve.

Coefficient of Variation (CV) – many commercial fiber buyers use this number instead of the SD in determining the worth of a bale of fiber. Its purpose is to allow a comparison of variation between one item and another. So, think of it this way: If you have a bale with an MFD of 16 and an SD of 4, that means 1/3 of your fibers range from 16-20 microns, and 1/3 range from 12-16 microns. The total spread is 8 microns, or 50% of your average of 16. Now, if you have a bale with a 30 micron AFD with an SD of 4, the range for two thirds of your sample is still 8, but as a percentage of 30 microns, it is much better - 26.6%. So, of the two bales, from a uniformity perspective, the 30 micron bale is better. These are two dramatic examples, but often, if a buyer is trying to decide between two bales that are narrower in micron differential, the CV can make or break the buyer's decision. And, when you, as a breeder, are looking at two different animals of similar micron, this measurement may prove to be a better tool than the SD in deciding which is the better animal.

"% greater than 30 microns", or conversely, the "Comfort Factor" which equals 100% minus the percentage of fibers over 30 microns – This is really an important piece of information – studies have shown that wearers of garments against the skin notice "prickle" when microns exceed 30. A 16 micron AFD should fall into the "Grade 1" category and receive the highest price for fineness. However, if there are a meaningful number of fibers greater than 30 microns, that fleece may fall into the Grade 2 category, thereby losing value. Naturally, the closer the AFD gets to 30, the more likely we expect to see fibers greater than 30. But, the narrower the SD, and the fewer the percentage of fibers over 30, the more valuable even a higher micron bale becomes.

Spin Fineness – this is a piece of information for the spinning mill – it tells the mill what type of twist should be put on the fiber, given all of the information above. From a "hand" perspective, it is not an indication of fineness, so we encourage breeders to focus on the factors mentioned above before this.

One important note: There are two primary types of histograms: The OFDA 100 and the OFDA 2000. The OFDA 100 uses a "butt cut" system whereby it measures the width of each fiber at a distance of 1/16 of an inch down from the cut end of the fiber. It also adjusts moisture in each sample to allow the best comparison from one sample to the next. It is a measurement of the fiber at a "moment in time". As such, it is best used for breeders trying to compare the micron of an animal from one year to the next, assuming your shearing occurs at approximately the same time each year.

The OFDA 2000 measures the micron along 5" of the shaft of each fiber and provides an average micron over the length of the fiber. The OFDA 2000 can be considered a "look back" over the last year, and can provide important information if your goal is to minimize variation in micron over the course of 12 months. It does not adjust for moisture content, and so must be used with consideration when comparing fiber samples from one part of the U.S. to the next. Additionally, the SD from an OFDA 2000 sample will represent variation along the shaft, as well as variation between fibers.

When to Take a Histogram

We recommend several histograms over the life of the animal:

First, if you haven't ever sent samples in, take one sample from the side of each of your animals at the next shearing. Based on those results, you should have a portion of your animals that remain in your breeding program, and others that become "fiber producers" only.

The second year, take three samples from all of those animals you deem to be of breeding status – from each animal, you should gather a sample from the shoulder, the side, and the hip. This will give you an idea of how uniform each animal is across its blanket.

Lastly, for those animals whose first sample was taken at an age between six and 18 months, we recommend that after the second year, you take side samples for two more years. The goal here is to see who in your herd is maintaining fineness. Our opinion is any animal who is able to maintain a micron of 27 or better as a full adult should be considered a "keeper".

How to Use the Histograms

So, now that you understand the key components of a histogram, where should you start? Our suggestion is simply to pick one of these categories and a number to accompany it – there is no wrong category – and focus on getting your whole herd to that number. So, you may select AFD and set a goal of having all of your offspring remain at or below 25 microns well into adulthood. Or, you may decide to focus on SD or CV – and don't forget that focusing on each animal having a uniform blanket is also a worthwhile goal! All of these goals point to one thing – uniformity of the herd!