

## **WOOL TERMINOLOGY - EXPLANATION OF ANALYSIS AND GLOSSARY OF TERMS**

The OFDA 2000 is a portable instrument that tests wool for fiber diameter, variability of fiber diameter, comfort factor, staple length, and many other measured and calculated traits. The American Sheep Industry owns and provides the machines to four universities and a cooperative to help improve the sheep industry's wool clip within the United States. These objective measurements are a useful tool for genetic selection in breeding programs and can be used during shearing to class wool.

### **Average Fiber Diameter (AFD)**

- This is a measurement of the wool sample's thickness measured in microns.
- A micron is another term for micrometer, which is one millionth of a meter or approximately 1/25,400 inches.
- As wool does not grow at a uniform thickness, fiber diameter varies within the staple and fibers growing next to each other grow at different rates. Even within a sample, it is not uncommon for fibers to have a difference of 15 or more microns.
- The OFDA 2000 reports this value under the abbreviation MIC AVE.

### **Standard Deviation (SD)**

- This is a measurement of the variation of wool fiber diameter.
- Statistically speaking, 2/3 of the fibers measured fall within +/- one SD of the Average Fiber Diameter.
- For example - a sample with an AFD of 22.5 micron and a SD of 4.5 micron would have 2/3's of the fibers measured between 18 and 27 micron. The other 1/3 of the fibers would be finer than 18 micron or coarser than 27 micron.
- The smaller the SD, the closer the fibers are to the Average Fiber Diameter, resulting in less variation among the individual fiber diameters for the entire sample.
- The OFDA 2000 reports this value as SD MIC.

### **Coefficient of Variation (CV%)**

- This is another measure of variability of the fiber diameter, but is expressed as a percentage and is relative to the average fiber diameter.
- This is determined mathematically using the equation:  $CV\% = SD/AFD \times 100$
- This is a useful measurement as it allows one to compare wools of different fiber diameters.
- Ideally, the CV% should be 20% or less within an individual animal sample.
- The OFDA 2000 reports this value as CV MIC.

### **Comfort Factor (CF%)**

- This is the percentage of fibers 30 microns in diameter or less.
- It has been shown that fibers greater than 30 microns are rigid and do not bend when they come in contact with the skin, resulting in the prickly feeling of wool and/or causing skin irritation.
- Wool that is going to be made into garments should have a CF% of at least 95%.
- Wool with a comfort factor of 95% is made into garments, so they do not feel scratchy or cause skin irritations.
- The OFDA 2000 reports this value as CF %.

**Staple Length (SL)**

- This is a measurement of the length of the relaxed staple expressed in millimeters.
- The OFDA 2000 reports this value as SL mm.

**Histogram**

- This is a graph that shows the individual fiber diameter measurements of a sample.
- The fiber diameter of each fiber measurement is put into “bars” on the chart, typically in one-micron groups. The higher the height of the “bar,” the more fibers have been measured in that group.
- This is a quick and easy way to view the variability of fiber diameter within a sample.

**Micron Profile**

- This is a graph of the variation of fiber diameter along the staple during the growing season.
- Individual wool fibers are measured every five millimeters along the fiber.
- The left side corresponds to the fiber tip and the right side corresponds to the fiber base (closest to the skin)
- This information is useful in determining the environmental differences that affect fiber diameter during the growing season and growers can use this information to make management decisions to benefit wool growth throughout the entire year.
- A relatively flat line indicates more uniform wool grown throughout the year.