



# FLOWERDALE ESTATE ALPACAS

## Fleece

### Fibre Testing. How To Interpret Your Results?

This information has been prepared by New England Fibre Testing to help owners interpret their fleece test results.

From the sample supplied to the testing laboratory, 2000 fibres are measured and then processed to obtain, mean (average) fibre diameter, standard deviation, co-efficient of variation, histograms comfort factor, coarse edge measurement, curve, curve standard deviation, and spinning fineness.

### FIBRE DIAMETER – ( $\mu$ )

A micron is one millionth of a metre (symbol ' $\mu$ '). The mean fibre diameter is a measure of the average width of the fibres. A 20 micron sample has an average fibre diameter of 20 millionths of a metre.

### STANDARD DEVIATION - (sd)

Standard deviation is a measure of sample variance. It is a calculation of the spread or distribution of all the fibres measured. Standard deviation is a value measured above and below the mean. In general it can be stated, that two thirds (2/3) of all the fibres measured lie between one standard deviation either side of the mean. So if we have an average fibre diameter of 20 microns and a standard deviation of 3.15, then approx two thirds or 66% of all the fibres measured lie between 16.85 micron and 23.15 micron.

The standard deviation for samples increases with micron. The greater the micron, the greater the expected 'sd'. To compare animals of different micron's standard deviation, we look at the Co-efficient of variation.

So what is the use of this figure?

The lower the 'sd' the more uniform and desirable the wool processing qualities becomes. Simple really, when you consider that if a manufacturer can obtain ingredients that are more uniform, the closer the manufacturer can stick to the specifications of a client. Less variation in wool may have the added benefit of creating more uses for it.

### CO-EFFICIENT OF VARIATION (CV%)

The Co-efficient of variation is calculated by dividing the standard deviation by the mean micron and then multiplying by 100 to gain a percentage.

$$CV\% = \frac{sd}{\mu} \times 100$$

The figure is a percentage and a ready method of comparing the variation of wools of different microns. One should note that we can only compare the standard deviations of wools with exactly the same fibre diameter or micron. If we wish to compare the variation of samples with microns of say 20 and 21 then we would look at their CV's. So it can be said that standard deviation and Co-efficient of variation are measurements of the same thing, except, expressed in a different form.



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This figure is interesting for the same reasons as standard deviation. CV% is also a good guide to staple strength, high CV%'s often are associated to tender wools. As a rough 'rule of thumb' any figure under 20% is good, 21% - 22% is acceptable and anything above 23% should be inspected carefully. For processing it is believed that for every 5% decrease in CV%, it is equivalent to spinning 1 micron finer wool.

### COMFORT FACTOR (CF or %fib>30 $\mu$ )

The comfort factor is the percentage of fibres measured that are less than 30 microns. It is believed that if this figure (for sheep) is less than 97%, then when processed, the material made from this wool can cause irritation to the skin.

### COARSE EDGE MEASUREMENT (CEM)

CEM measures how far from the mean fibre diameter, in microns, the broadest 5% of fibres measured starts. This figure is used to give you some indication of the spread of fibres and what the tail of the histogram looks like without actually looking at it.

So if we have a 20 micron sample and the finest, of the broadest 5% of the 2000 fibres measured is 30 microns, then the CEM is 10 microns.

### SPINNING FINENESS (SF)

This figure provides an estimate of the performance of the sample when it is spun into a yarn. Spinning Fineness is calculated by combining the average fibre diameter ( $\mu$ ) and the Co-efficient of variation (CV%).

### CURVE

The curve is a measure of the crimp of the fibre. A high figure means that the sample has a high crimp frequency and a low figure means that the sample has a low crimp frequency. This figure is expressed as an angle in degrees.

### CURVE STANDARD DEVIATION

Curve standard deviation is probably more important than the curve figure itself and it is a measure of the variance in the crimp of the sample. As a "rule of thumb" the sd of curve should be two thirds of the curve figure to be an acceptable result. Thus if a sample has a 100 degree curve measurement then if the sd of curve is 66 degrees or less then the sample should be a good one.

It should be noted that in sheep's wool, many samples could have the same curve although the samples with the lowest sd of curve should be the most stylish.

### HISTOGRAMS

A histogram is a printout showing a graph of all the 2000 fibres measured. Thus it shows the distribution or fibre spread in a pictorial form. The simplest way to understand all of the information and to compare animals above measured traits is with the use of a histogram.

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