

## TESTING FOR COARSE FIBRES

(Bob Kingwell, Monga Alpacas, 2017)

Just when you thought you had your primaries under control, think again. They may be coarser than you thought. If you have been relying on fleece test results to measure the success of your breeding program to control coarse primaries in your saddle fleece then you have probably been making decisions based on false information.

### THE PROBLEM

The problem has arisen because the OFDA 2000 instrument (Optical Fibre Diameter Analyser) was designed for the merino industry and up until recently it was assumed that it would be equally suitable for the alpaca industry. It wasn't until 2016 that the inventor, Mark Brims of BSC Electronics, had the opportunity to analyse large numbers of alpaca fleece diameters and realised that they were more variable and contained a greater percentage of the coarse primary fibres than merino fleece. The instrument was initially programmed to eliminate all diameters that were greater than four times the standard deviation of fibre diameters above the average fibre diameter. This was done by including a setting that could be turned either ON or OFF and was referred to as the 'trim high' setting. Up until 2016 therefore, all alpaca tests were performed using the trim ON merino setting.

The diameter cut-off point for the trim ON setting was determined by estimating the average standard deviation of fibre diameters (SDa) for the average merino fleece of a particular fibre diameter (FDoff) using the formula  $SDa=(FDoff \times 0.246)-1.069$ . This SDa was then multiplied by 4 and added to the FDoff to determine the diameter above which all other diameters would be removed/trimmed from the results to determine the trim ON values for FDon and SDon. Maximum diameter equals  $FDoff+(SDa \times 4)$ .

### THE EFFECTS

When fibre diameters are symmetrically distributed about the mean, less than 0.1% of fibres will be eliminated when the trim is ON. If however the fibre diameters are skewed towards the coarse edge of the fleece histogram, this can result in as much as 1% of the fibres being eliminated.

Alpaca fibres can be heavily skewed towards this coarse edge which contains most of the primary fibres in the sample. Because about 10% of the fibres will be primary fibres, this means that 1% of all the fibres represents about 10% of the primaries and these will be the coarsest fibres in the sample.

When the trim high setting is turned ON for alpacas, this can result in the actual average fibre diameter (FDoff) coming down slightly and the standard deviation of fibre diameters (SDoff) coming down significantly. Other results that are calculated from the FD and SD such as comfort factor (CF), coarse edge micron (CEM), coarse edge percentage (CE) and the coefficient of variation (CV) can also be significantly affected in that they appear to be better than they really are.

The following two histograms demonstrate the difference in the results when the trim setting is ON compared to when it is OFF. The test was done on a mid-side sample using an OFDA 2000 with the trim high setting OFF. This enabled the instrument to produce the results using all the measured stored diameters. The setting was then turned ON to enable the instrument to delete the coarse fibres from the recalculated test results.

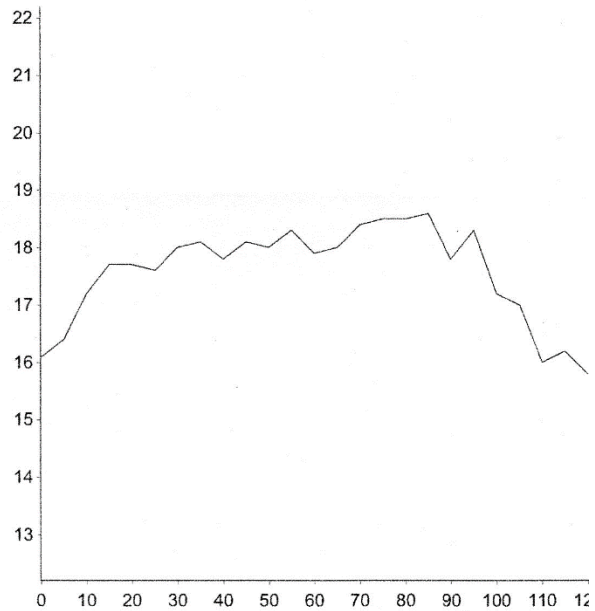
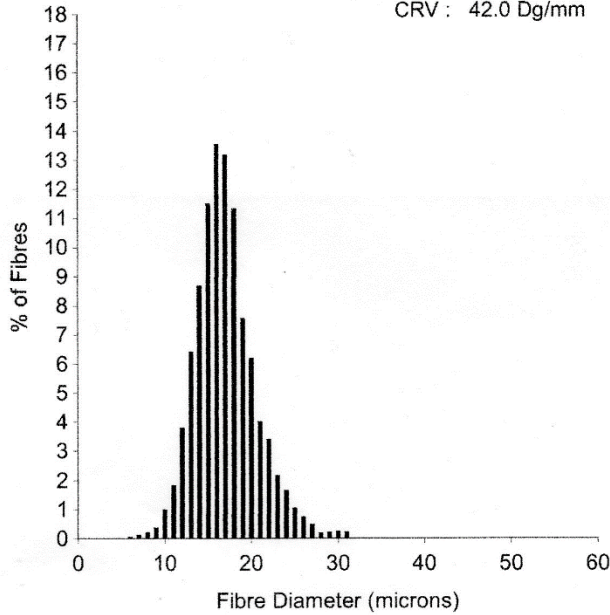
### FALSE ASSUMPTIONS

The top histogram suggests that this alpaca has its coarse saddle fibres under control. There are no fibres above 31 microns, the SD is a low 3.5 microns, the CEM is a creditable 6.9 microns, the CF is

OFDA 2000 REPORT : SORTED BY TAG  
TONalpacaoct 17 (145Records)

EarTag : kalani 1  
 Micron : 17.0 mic  
 MicDev : -4.3 mic  
 SD : 3.5 mic  
 CVD : 20.6 %  
 CEM : 6.9 mic  
 CF : 99.8 %  
 SF : 16.5 mic  
 CRV : 42.0 Dg/mm

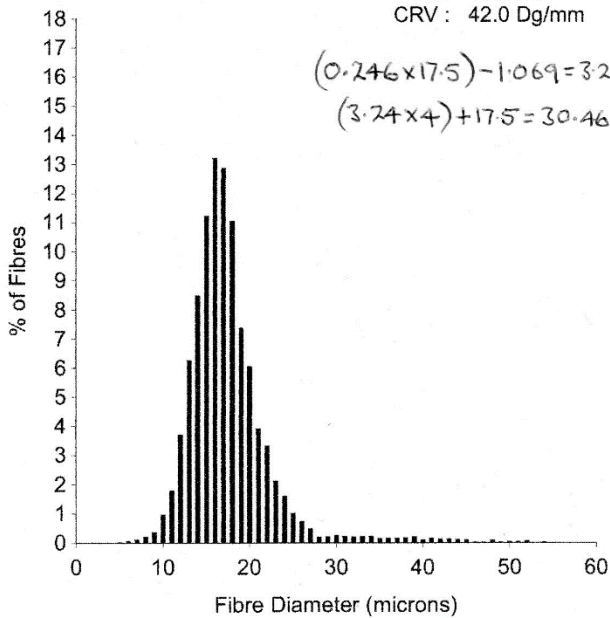
Staple Len : 125.0 mm  
 Finest Point From Tip : 120.0 mm  
 SD Along : 0.90 mic



OFDA 2000 REPORT : SORTED BY TAG  
TOFFalpacaoct 17 (143Records)

EarTag : kalani 1  
 Micron : 17.5 mic  
 MicDev : -4.1 mic  
 SD : 4.9 mic  
 CVD : 27.7 %  
 CEM : 7.9 mic  
 CF : 97.4 %  
 SF : 18.2 mic  
 CRV : 42.0 Dg/mm

Staple Len : 125.0 mm  
 Finest Point From Tip : 120.0 mm  
 SD Along : 0.90 mic



$$(0.246 \times 17.5) - 1.069 = 3.24$$

$$(3.24 \times 4) + 17.5 = 30.46$$

almost 100% and the CV is 20.6%. Most breeders would assume this was a good female to include in their breeding program. The standard testing procedure using the trim ON that has been used for the last 10 or so years produced these results.

The second histogram however tells a different story. It was produced with the trim setting switched OFF and all the measured diameters in the test sample were included in the results. These true results clearly show that the alpaca does not have its coarse fibres under control. There are coarse fibres going out to 50 microns, giving it a comfort factor of 97.4%. The SD has gone from 3.6 to 4.9 microns, the CEM has gone from 6.9 to 7.9 microns and the CV has gone from 20.6% to 27.7%. This female should probably not be included in a breeding program designed to improve herd fleece.

#### THE SELLING RUB

The industry now faces a dilemma. The trim OFF results are essential for making the right breeding decisions in order to reduce the level of coarse fibres in the national herd. However breeders wishing to sell alpacas will prefer to advertise their alpacas using the trim ON results. It will therefore be a case of buyer beware. If you are buying alpacas to reduce the extent of coarse fibres in your herd then it is suggested that seeing results determined with the trim setting switched OFF will result in a more informed decision.

#### CONCLUSIONS

Good quality alpacas that have their coarse primary fibres under control will not show any appreciable difference between the two different sets of test results. However if all that is available are results produced with the trim setting ON then how will you know if it really is as good as the false results suggest.

Accurate test results can only be obtained by turning the trim setting OFF. The global industry now has a responsibility to ensure that future testing is standardised to ensure that all tests done on the OFDA 2000 instrument are performed with this setting turned OFF.

The Australian Alpaca Association has the opportunity to lead the way by implementing these changes as soon as possible and certainly before the next National Show.