

Wool Testing Services Info-bulletin

Fibre curvature in alpacas

Introduction

With the increased interest in the measurement of fleece samples from alpacas, a number of questions have been raised concerning the meaning of mean fibre curvature on these samples.

Whilst some information has been published, there appear to be some divergent views expressed on the importance of this measurement. This bulletin is intended to impart some factual information which may be useful to growers trying to understand the measurement.

What is fibre curvature?

Info-bulletin 5.5 gives some background information on fibre curvature measurement. The measurement, as carried out by the OFDA and Laserscan instruments, is primarily an indication of the average curvature of a short length of fibre, expressed in units of angular degrees subtended by a short arc of fibre (in units of %/mm). The measurement bears some relationship to crimp, in that the crimpier a fibre, the higher the mean fibre curvature.

In measuring crimp, the instruments are viewing the fibre snippets in two dimensions and measuring over a short length (about 0.2 mm). The results therefore do not indicate anything about the 3 dimensional form of the crimp, the depth (or amplitude) of crimp, nor the style or definition of the crimp.

As can be seen in the plots, whilst there is some general relationship between mean fibre diameter and mean curvature, mean curvature or crimp in alpacas is NOT a good indicator of diameter. This can also be seen more clearly for merino wools in Info-bulletin 5.5.

Are there any measurement issues?

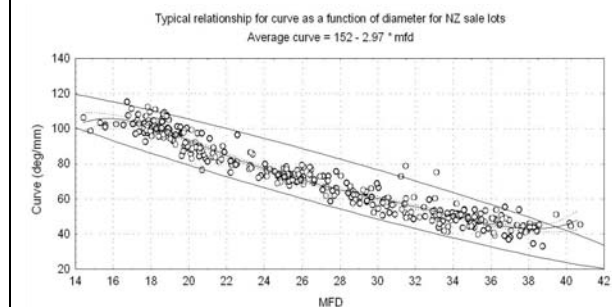
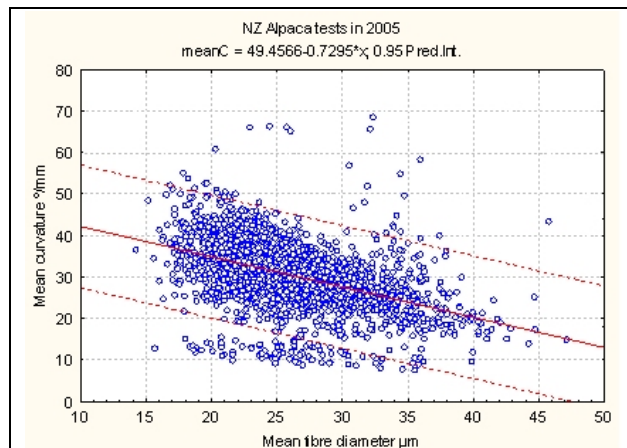
Mean fibre curvature measurements are affected by the way in which the measurements are undertaken and the pre-history, or processing pathway, used in the presentation of the fibres for measurement. There is some indication that these problems will be resolved by calibrating curvature measurement, but at this stage (mid 2007) this has not been finalized.

Fibres measured in their natural state (eg on OFDA2000) will give different values to fibres that have been cleaned in water or in solvent (OFDA 100 or Fleecescan systems), or suspended in water or propanol (Laserscan). Different laboratories will therefore report different values. There are a number of technical publications on our website covering these issues.

Nevertheless, if all the measurements have been carried out in the same laboratory using the same methods, the results should be comparable.

Breed differences

Suri and Huacaya have been noted as showing different curvature-diameter relationships.



Comparing mean curvature against diameter for alpaca samples (upper plot) with a typical curvature/diameter relationship for greasy wool sale lots (lower plot, from Info-bulletin 5.5)

As may be expected, Suri, on the whole, give lower values of mean curvature for the same diameter.

The importance of fibre curvature?

Different authors have expressed quite different views of the importance of crimp or curvature to animal selection, fibre processing, and final product 'feel' or handle.

We have demonstrated that for wool, curvature plays an important part in bulk and resistance to compression (RC). Other authors have shown that alpaca conforms to the same general relationship between RC and diameter and curvature as wool, but that RC values are generally lower for alpaca. For the same diameter, higher curvature generally gives higher bulk.

Is there a simple answer to the question? In our view, 'no'. The use to which fibre curvature measurements can be put will depend on the user. It may be important in some breeding selection systems and not in others. Higher curvature may be desirable for some applications but a processing nightmare for others. Before making any decisions about the use of fibre curvature, growers are advised to do their homework and be sure of their aims.