



Ideal Alpaca Community

SAMPLING AND BASE-CUT FOR MEAN FIBER DIAMETER TESTING OF INDIVIDUAL ANIMALS

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Introduction to Fiber Sample Techniques

The “mid-side sample” has been shown to be a useful sample for estimating the *average* fineness of a skirted fleece. The sample is mini-cored using two-millimeter diameter coring tubes that extract the test sample from the compressed side sample. When the core tubes enter the compressed sample, cores are cut from many different locations along the same fibers, which *takes into consideration the environmental and health condition of the sampled animal.*

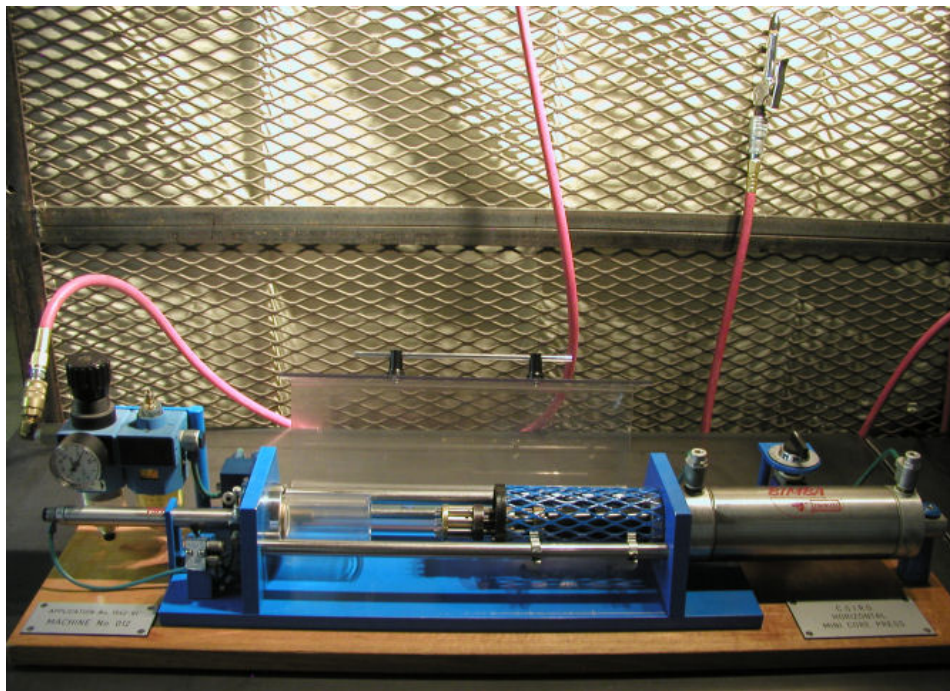


Figure 1. Full view of pneumatic mini-corer

Commercial fiber processors commonly use a composite sample (see Figures 2 & 3) from cored bales to represent an average of all fiber diameters in a “lot”, which may total thousands of pounds.

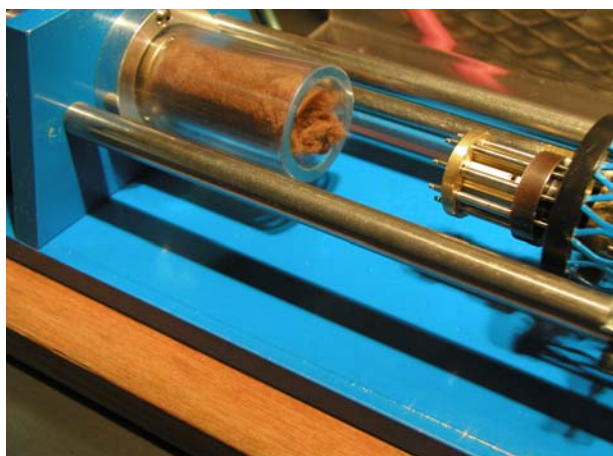


Figure 2. Mini-core sample with alpaca fiber in compression tube.

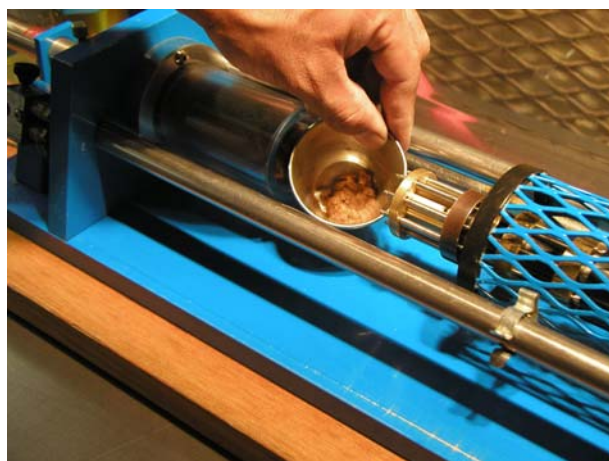


Figure 3. Collection of 2mm mini-cored fiber sample.

The “base-cut” sample, also commonly called *the “butt-cut” sample*, is best for use in genetic evaluation. It contains the least environmentally influenced number of fibers. This side sample consists of 2-mm snippets cut at the base of the staple to measure the average fineness of the fibers being grown *at a specific point in time and at a specific age*. For estimated progeny difference (EPD) calculations, it is necessary to obtain sub-samples by die cutting (see Figures 3 – 5) close to and parallel to the base of the staple.



Figure 4. Full view of pneumatic die cutter.



Figure 5. Fiber sample positioned in the die cutter to permit 2-mm snippets at base of staple.



Figure 6. 2-mm die cut samples in collection tray. Typically, several thousand individual fibers are collected.

Sampling Considerations & Procedures

Ideally, when you are assessing and comparing contemporary groups of animals, the samples should be taken at a known age. The yearling sample is often chosen in EPD programs for several reasons: it is assumed the young animal has been well looked after, has been on a good level of nutrition, and that its mean fiber diameter (MFD) at the base of staple (butt-cut) is unaffected by pregnancy, lactation, or other stresses as will every subsequent annual sample, assuming the animal is placed in production.

Both the base-cut or mini-cored snippets are solvent washed, dried, and conditioned under standard conditions for testing textiles (65% relative humidity and 70°F) for four hours. This conditioning removes the moisture differences found in samples sent to the laboratory from various locations across the United States. All samples are then mounted on a 70-mm square microscopic-grade, hinged slide, and measured on the OFDA 100. *Several thousand fibers* are measured in each test. The more fibers measured in a given sample, the greater the accuracy of the test result.

The size of the side-sample varies depending on the test requirements for the project. The EPD project of Ideal Alpaca Community (IAC) requires a four-inch square side-sample. This sample is taken as close to the skin as possible, placed in a gallon zip-lock bag with the sample flat and retaining the staple configuration. When the sample reaches the lab, its identity is recorded and cross-referenced to the

IAC's database which contains each alpaca's physical traits and pedigree information. Sub-samples for length are then drawn, and the remaining sample is cut parallel to and close to the shorn base.

In order to insure the accurate identity of each four-inch fleece sample, as well as to provide critical supplementary information on shearing dates, a special transmittal form is enclosed in the zip-lock bag containing the sample. The form is completed using a computer connected to the IAC database. At the time the form is printed, the entries are also recorded in the database. The printed paper copy then accompanies the sample sent to the lab. It is crucial that the entered information is complete and accurate. Missing or erroneous data can hold up the testing procedure and may negate the use of the animal in the EPD analysis.

Measurement Systems & Results

The **OFDA 2000** is a portable instrument designed to measure a staple profile in 5-mm increments on approximately 100 to 150 fibers. The number of individual measurements is dependent upon the staple length and the density of fibers on the slide. The sample is typically not washed prior to measurement, but the manufacturer recommends that it be in equilibrium with prevailing temperature and humidity conditions. Even though the samples are tested at ambient temperature and relative humidity (where the instrument happens to be located), a built-in thermometer and hygrometer provide information that permits the measurements to be adjusted to those that would have been obtained under standard conditions.

Problems may arise when the samples are not given adequate time to reach equilibrium with ambient conditions, particularly if the samples originally contained more moisture than they would be expected to contain at standard conditions (65% RH and 70°F.) If multiple samples are being tested from a single herd, an average grease correction factor (GCF) is calculated by measuring 10 to 20 samples before and after cleaning in a solvent. This average GCF is then automatically subtracted from all subsequent measurements made on unwashed samples. When only a few samples are to be measured, the fibers may be solvent washed or a default GCF is sometimes used. Use of an average or default GCF introduces errors into the estimates of MFD, SD, and CV.

When analyzing fiber samples for IAC members, our lab uses only the laboratory **OFDA100** testing system. All fiber samples from every farm are tested under identical conditions. Thousands of individual fibers are tested for each alpaca fleece sample. Furthermore, the MFD measurements are made on all fibers at the very base. This methodology results in more accurate and more consistent results.