

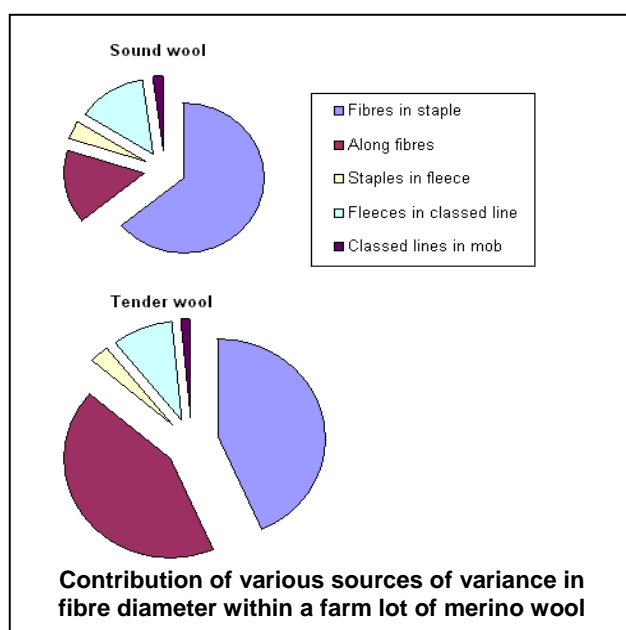
Wool Testing Services Info-bulletin

Sampling wool

Introduction

Wool is a very difficult material to sample representatively. Sampling is potentially the largest contributor to measurement uncertainty. There are thousands of fibres in a staple, thousands of staples on a fleece, hundreds of fleeces in a farm lot and several farm lots in an export consignment.

Single fibres vary in diameter along their length, and within a staple, the fibres vary enormously in diameter and usually also in length. The staples vary around a fleece not only in mean diameter and length but also in vegetable matter content and yield. Animals in a mob vary in fleece properties and mobs making up a flock are all different. The relative magnitude of some of these variances is illustrated in these plots:



Flocks obviously vary from farm to farm, and therefore the variety of fibre lengths, diameters and yields that could make up a consignment are almost infinite. How do we get a representative sample of a few grams to represent a single animal, or even a consignment weighing 17 tonnes or more? The answer varies depending on the source of wool, but the primary principle is that systematic procedures must be followed, and to reduce uncertainty, laboratories use high quality blending.

Sampling from individual animals

Two approaches can be used – either to core the entire fleece (or the skirted fleece), or to take staples from a reproducible position on each animal (most often the left midside). If the requirement is to select animals for breeding or culling, either approach is satisfactory as long as all the animals being compared are sampled the same way. Further detailed information can be found in papers D32 and D33 which can be found on the Technical Publications page of our website.

Sampling for IWTO certification

Sampling of wool for IWTO certification is governed by Regulations published by IWTO. IWTO certificates can only be issued by IWTO Licensed laboratories, which are accredited for both sampling and testing. More information can be found on the Certification page of our website, or at www.iwto.org

The common principles for all forms of wool in bulk are:

- All bales or units must be sampled equally
- Bales or units must be weighed at the time of sampling on certified scales
- Sampling and weighing must be carried out or supervised by authorized personnel independent of the sales transaction
- All samples must be sealed immediately after sampling.

Greasy wool

Greasy wool in bales is sampled and weighed at registered sampling sites in units not exceeding 12 tonne. At least 93 to 94% of the length of every bale is sampled by the core tube. The number of cores taken from each bale is determined by schedule based on the size of the lot and the expected variation within the bales. This aims to produce a precision of better than $\pm 1\%$ of the IWTO clean wool content.

Merino wool and all auction wool is also sampled by a grab machine. The number of grabs is also determined by schedule. The grab sample is used for display purposes, and for merino wool, the preparation of samples for length and strength testing.

Scoured wool

Virtually all scoured wool produced in New Zealand is packed in high density bales and is sampled and weighed by automated equipment. Core samples are taken by high pressure machines after packing, and again, every bale is sampled. Where samples are required for Length After Carding (LAC), representative 'grabs' are also taken from the pre-compression box of the press by a specially-designed automated spear. Consignments are sampled in units of no more than 7 tonne.

Tops and Sliver

Because top and sliver needs to be sampled during production (rather than from the final packaging, to avoid damage), and therefore lengthy supervision would be required, few consignments of tops or sliver are IWTO certified by independent laboratories. Nevertheless, some mills have been licensed by IWTO to issue IWTO certificates, and independent laboratories such as SGS can be required to supervise sampling in specific circumstances or for specific destinations.

Non-certification sampling

Where relationships of trust have been established between buyer and seller, sampling is sometimes carried out by one of the parties. In such circumstances, the test house is solely responsible for testing the sample and such results are normally issued as test reports. Occasionally, where sampling and weighing is supervised or carried out by test house staff, but for some reason an IWTO certificate cannot be issued, the test house may issue a test house certificate.