

# Wool Testing Services Info-bulletin

## Length and Strength

### Background

Staple Length and Strength testing was introduced in Australia in the 1980's to allow objective measurements on greasy wool combing types, which could be used for predicting processed length in tops. After fibre diameter this is one of the major factors in determining the price of combing wools.

The measurement system was specifically designed around Australian merino types, and to give meaningful results must be carried out on wools that have a clean blocky staple structure.

AWTA Ltd estimates that over 85% of Australian combing fleece wools are now presale tested for L & S. It has also been suggested that Australian buyers have paid 12 c/kg extra on average for wools that have been measured for L & S.

Staple length and strength testing is now also available on combing wools produced in South Africa and Argentina as well as in Australia and New Zealand.

Staple Length and Strength results have been available on New Zealand fine wools for over a decade, and it has been shown that the measurements are equally applicable to fine wools originating on either side of the Tasman.

There's no doubt that whatever personal views may be held around the trade, Staple Length and Strength measurement on combing wools is now well established.

### Sampling

Samples for L & S measurements are taken as a series of at least 60 tufts from the grab sample that is subsequently used for auction display. The tuft samples are taken by our trained staff and specially packed for transport to our main laboratory in Wellington.

From each tuft one staple is prepared. This is a skilled operation that must be undertaken by carefully-trained staff in order to avoid any bias. Each staple set is prepared by at least 4 people. Staples are stored in special trays and allowed to condition overnight in environmentally-controlled conditions.

### Measurement

Measurement is undertaken in accordance with IWTO-30. During measurement, each staple is passed through a specified array of light sensors, which measure the staple length. Tippy staples can give misleading results.

In order to predict the way in which the wool fibres behave when they are carded and combed, it is necessary to know something about the strength and where, along the fibre, it is likely to break.

This is achieved by gripping the individual staples as close to the ends as possible and then stretching them until they break. By weighing the two broken portions of the staple, it is possible to calculate where the break occurred.



The results for staple length, staple strength, and position of break are averaged over the total number of staples tested (usually in excess of 55). These are the results that are certified on each lot. Additional information is now also routinely provided on the distribution of individual staple strength measurements.

### How the results are used

(See also Info-Bulletin 1.4)

#### By growers:

Growers might use the results as an additional piece of information in determining optimum shearing times. This tends to be of more importance in areas such as Western Australia, where tenderness and position of break are strongly influenced by environment and management factors.

An important factor, however, is to apply consistency in classing to avoid mixed lengths and potentially lower strengths.

#### By mills:

Work carried out in the 1980's in Australia, Europe and Asia established several reliable relationships between staple length and strength results and the length and distribution of length obtained in the top, when the core test results were taken into account. This work was repeated in 2004.

"TEAM" equations are used to calculate a standardised Hauteur (estimated length in the top) for each lot, and this figure is now entered in the sale catalogue. Individual mills need to calibrate themselves to this predicted Hauteur. This is usually achieved by adding or subtracting a fixed amount to the predicted values, although in some mills both slope and bias corrections may be needed.

Mills and their buyers use these results to put together consistent consignments. The wider availability of additional measurements such as these has enabled mills to produce very large combing batches of predictable top length.

#### Issues:

In New Zealand, staple strength does not generally present problems since most lines are sound. However, the high strength and minimal seasonal effect means that most staples break in the middle. Wools with a high percentage of middle breaks were potentially penalised in the early TEAM equations, but the effect is much reduced in TEAM-3.