This is the published version:

McGregor, Bruce A. 2013, Softness properties of mohair, Mohair news, no. October 2013, pp. 5-6.

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Mohair Research Update No. 23
----- Softness properties of mohair

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Introduction
Consumers are placing increasing importance on the comfort and softness properties of textiles. The textile industry has responded with the development of many chemical and/or physical treatments, such as silicone softening agents or plasma treatment, to modify the fibre surface and improve the performance properties of wool fabrics. The textile industry has also developed more reliable systems of objective testing fabrics.

While cashmere has long been regarded as one of the softest animal fibres (von Bergen, 1954) there is surprisingly little objective information on the comparative analysis of soft animal fibres such as alpaca, Angora rabbit, camel hair and mohair. Softness properties of animal fibres are determined in laboratories by compression testing under carefully controlled conditions. Research with Merino wools has shown that wool with lower resistance to compression produces softer knitwear.

This investigation is concerned with two questions:
1. do rare animal fibres vary in softness in the same way as reported for Merino wool? and
2. how does the softness of mohair compare with the softness of other rare animal fibres?

In the absence of comparative information on the softness properties of rare animal fibres, this work quantified and compared the softness of a range of rare animal fibres by determining their resistance to compression and relating that to other objective measurements.

Methods
The following animal fibres were assembled and tested:

1. mohair (39 samples); cashmere (94 samples); alpaca (87 samples); cashgora (15 samples),
2. other fibres (33 samples of Angora rabbit, bison wool, camel hair, cow, guanaco, llama, quivet, vicuña, yak).

The samples were cleaned, carded and then tested for mean fibre diameter, other fibre diameter attributes, fibre curvature (objective test for fibre crimp), and resistance to compression. Samples were also tested for fibre length and the colour of samples was determined.

Findings
There was a range in the resistance to compression properties of mohair and the other animal fibres (Figure 1). The most important attributes affecting softness of these samples were the fibre curvature and the mean fibre diameter. Reducing the fibre curvature reduced the resistance to compression (softer) and increasing mean fibre diameter also reduced resistance to compression.

There was no difference between the softness of mohair and Huacaya alpaca fibre, which had the lowest resistance to compression of all the fibre samples tested. Angora rabbit had the highest average resistance to compression of all the fibre samples tested.

For mohair there was little variation in the resistance to compression (3.8 to 4.9 kPa), with a very small increase as the mean fibre diameter increased.

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Figure 1. Scatter plots showing the relationships between mean fibre diameter, fibre curvature and resistance to compression (Rc). Symbols:
- O, New Origin cashmere; Â, Iranian cashmere; O with left half black, cashgora; O with botton half black, mohair; ¶, quivet;
- D, Huacaya alpaca; n, Suri alpaca; D cross hatched, llama; D with top side half black, vicuña; D with side quarters black, Bactrian camel;
- q, cow; p, American bison; r, yak; “”, Angora rabbit.
Conclusions
Different rare animal fibres had distinctive resistance to compression (softness) and fibre curvature properties. Huacaya alpaca and mohair had the lowest and Angora fibre the highest resistance to compression. There was considerable variation in the resistance to compression both between different rare animal fibres and also within some of the animal fibres. For most of the rare animal fibres studied, the maximum resistance to compression measured was less than or equal to the lowest reported resistance to compression for Merino wools. Research with Merino wool has shown that wool with lower resistance to compression produces softer knitwear. Rare animal fibres show commercially important variations between and within fibre types in softness, as measured by resistance to compression. However, given the low values of mohair resistance to compression, and the relatively low response of resistance to compression to changes in fibre diameter and fibre curvature, it is unlikely that the use of resistance to compression in mohair assessment is warranted.

Acknowledgments
Dr McGregor was employed by the Victorian Department of Primary Industries during part of this project. The Rural Industries Research and Development Corporation partly funded this work. Individuals and companies who provided samples are gratefully acknowledged.

References and further reading
This is a summary of the following report. More details can be emailed to interested farmers by contacting the author at: bruce.mcgregor@deakin.edu.au


The 5th Australian Buck Trial

TRIAL BEGAN ON 28TH JULY 2013

Finishing on the weekend of 8th-9th February 2014 with shearing and classing of the trial animals.

This trial will extend the measurement and evaluation to include weaving type mohair. Animals will be assessed and the fleeces classed by Jim Stanley (AMMO) and GT Ferreira with an eye to weaving types.

As with previous trials the animals will be subjected to extensive assessments with body weights, fleece weights and various fleece characters being measured and assessed at Neck, Mid-side and Breech positions.

In addition The Cudal Mohair Studs Hogget will be assessed by GT Ferreira in a public demonstration of the weaving type assessment techniques. Growers are encouraged to attend and take part in the final assessment weekend.

So far the excellent season has resulted in rapid weight gains for all animals. Growth patterns and individual weights are available on the mohair web site – News/buck trial page. There are also reports of worm counts and a preliminary medullation measurement trial. This technique will be used with the final fleeces to extend our understanding of this factor. More details and further information will be on the web site as it becomes available.

Doug Stapleton
Buck Trial Manager. NSW Division

Lush spring conditions