

RAW WOOL WITH LOW LEVELS OF COARSE FIBRE PROCESSES INTO MORE COMFORTABLE KNITTED FABRIC

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Improving the comfort of apparel wool products could significantly increase demand for wool. One aspect of discomfort is the prickly sensation that some people feel when wearing wool next to the skin. Extensive work has revealed that this prickle sensation arises due to the presence of coarse fibres which protrude from the fabric (CSIRO DWT Report G 64, 1988). These coarse (stiff) fibres impact on the skin with sufficient load to trigger pain nerve endings which lie very close to the skin surface. The aim of this study was to determine whether fabric of low prickle sensation could be produced from raw wool within the 22.6 - 23.5 micron category. Wool having this micron or less accounts for over 70% of annual Australian wool production.

Mid-side samples were collected from flocks of sheep on 15 different properties prior to shearing and were analysed for fibre diameter distribution by FDA. Fleeces were selected on midside sample measurement and remeasured immediately prior to processing. Two groups of three fleeces were scoured and processed to top at the mill at CSIRO DWT Belmont. Results are presented in Table 1 of FDA measurements of the wool top from the two fleece groups DGN 7008 and DGN 7010, as well as two additional tops which were used to extend the range of prickle sensation within the comparative prickle test. Knitted fabric was produced from the four samples of top and tested for prickle sensation on 25 people in a double blind trial using a paired comparison protocol. Each combination of paired fabrics was evaluated 100 times.

Table 1 Fibre Distribution Analyser (FDA) results on the top

Group No.	Fibre Diameter (um)		Fibres > 30 um in diameter (%)
	Average	c.v.(%)	
DGN 7010	22.9	18.4	3.8
DGN 7008	21.6	23.3	5.8
87/34	23.5	23.2	9.7
K5W/10	26.0	27.5	22

FDA distributions changed little during processing as FDA results on the top closely reflected the average of the six random samples taken from the fleeces prior to processing. Prickle sensation was significantly less in the fabric made from top DGN 7010 even though its average micron was 1.3 micron greater than top DGN 7008.

These results are consistent with the previous finding that the prickle sensation is due to the level of coarse fibre present in the fabric rather than its average micron. They indicate that improved fabric comfort could be achieved by careful selection or production of raw wool with less coarse fibre content. We gratefully acknowledge the support of the Ross McKenzie Trust.

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