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## Alpaca Fiber from the Textile Point of View



by Mike Safley

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Once alpaca fleece is in the bag, what is it worth? The textile manufacturer could not care less whether the fleece available for sale came from a prize winning stud or the herd's ugly duckling. Understanding what qualities the buyer desires most is the key to getting maximum value from alpaca fiber production.

All natural fiber falls into one of two categories, carpet or apparel. Carpet is coarse, apparel is fine. Apparel fiber is more scarce than carpet fiber and sells for considerably more money per unit of measurement on the international market.

The textile market is dominated by sheep wool. All other animal fiber, including alpaca, is known as specialty fiber. The results of processing trials conducted by fiber experts Bray,

Long, and Van Bergen rated mean fiber diameter as the most important quality of sheep wool immediately affecting its value for manufacturing purposes. Their studies rated the relative value given to various fiber properties as follows:

Property*	Relative Importance	
	Study 1	Study 2
Fineness (mean fiber diameter)	65%	80%
Length	15%	15-20%
Tensile Strength	10%	Only important when present or absent to an abnormal degree
Remaining properties	10%	

\* Color was not considered in these studies

According to Van Bergen and Lang, the reason fineness impacts price is due to its effect on a yarn's spinning limit, which means that, at any given count of yarn, the finer the fiber, the greater number of fibers in a cross section. This, in turn, leads to a more uniform yarn diameter, greater yarn strength, and greater softness of handle.

Soft garments which can be worn next to the skin are most expensive. Cashmere, with its soft, seductive feel, sells for high dollars in exclusive shops. Why is cashmere always soft and wool often itchy? Fiber fineness.

Over 30% of American consumers surveyed claimed to be allergic to wool. These same people can wear cashmere or alpaca with no adverse reaction. The International Wool Secretariat and CSIRO, the Australian research organization, with its wool technology and animal production divisions, were extremely concerned by the perception that wool commonly caused allergic reactions.

Extensive research has identified the cause of the allergic reactions in consumers who wore wool. The research began by administering common tests for allergic reactions. This involved grinding wool to a fine consistency, suspending it in liquid, spreading it on the allergic consumers and pricking the skin with a needle. The result was that consumers, originally thought to be allergic to wool, didn't react.

What was finally found to be the cause of this so-called allergic reaction to wool? Fiber diameter. The prickle factor was guilty; the coarser the fiber, the more severe the allergic reaction.

Researchers found that coarse hairs extending from the yarn or fabric prick the skin and stimulate the pain receptors, thereby causing redness, irritation, and itching. Once fiber diameter was identified as the culprit, studies were done to decide at what mean diameter prickle occurred.

Fiber that averages 21 microns or less tends to be soft to the touch. Fiber with a coarse edge over 30 microns almost always itches. Yarns that contain more than 5% fiber over 30 microns create garments that only fleas could love.

Consumers, who previously claimed to be allergic to wool, experience no negative reactions as long as the average micron count of the garment they are wearing does not exceed 21. Further research has conclusively proven that any fabric which is made of any fiber (man-made acrylic, hair from cashmere goats, etc.) averaging more than 21 microns causes pain on the skin and a so-called allergic reaction (see the attached diagram).

Alpaca is no exception. Coarse alpaca itches. Fine alpaca feels smooth and silky next to the skin. That's why fiber diameter is by far and away the most dominate value affecting fiber prices.

Bruce McGregor is a senior scientist with the Victorian Department of Agriculture in Australia, specializing in improving the production and quality of specialty animal fibers. He wrote an extensive article for *Alpacas Australia* (issue 13, 1995) entitled *Alpaca Fleece Development and Methods of Assessing Fibre Quality*. His article ranked, in order of importance, the qualities of alpaca fleece that processors have valued over many years, as follows:

1. Fiber diameter
2. Fiber length
3. Fiber color
4. Freedom from contamination
5. Degree of medulation

McGregor does not include tensile strength as a quality affecting value. The strength of alpaca fiber is so superior to other natural fibers, such as wool, that it is not considered an issue in pricing.

Alpaca fiber's staple length is important. Length commands a premium in the market. This is because length increases the manufacturers' ability to spin finer and stronger yarns for weaving. But McGregor still concludes that Markets usually discriminate against length to a lesser degree than fiber diameter.

The best way to increase uniformity is to reduce the average micron count. A finer fleece has less standard deviation. This is just another reason why micron count is the primary determinate of a fiber sale price.

Another reason for fiber diameter to be the dominate value is that the fiber diameter distribution (FDD) can not be accurately

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