

COMPONENTS OF ALPACA (*LAMA PACOS*) FLEECES AND THE POTENTIAL OF IN-SHED MEASUREMENT OF FIBRE DIAMETER

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The Alpaca (*Lama pacos*) was re-introduced into Australia for fibre production in 1989 and numbers have steadily increased since that time to reach a population of approximately 30,000 in 2001. Alpaca fleece is graded on the basis of fibre diameter (FD), length and colour. Subjective appraisal of alpaca fibre diameter is largely based on a combination of visual fineness and handle, but it is desirable that all fleeces be objectively tested (Knox 1998). In this study, we determined the constituents of alpaca fleeces and measured fibre parameters in greasy and cleaned alpaca staples.

Forty eight mid-side fleece samples were collected at the annual shearing from an alpaca herd. Wax, suint and dust content of fleece samples were determined using the method of Hemsley and Marshall (1984) and reported as percentages of clean dry fibre in the fleece. Greasy and clean staples were measured for FD, FD variation and curvature using the OFDA2000 set with a zero "grease correction" factor, following conditioning for a minimum of 24 h at 20°C and 60% relative humidity. Greasy staples were measured and then cleaned with two changes of petroleum spirit, re-conditioned and measured with minimal disturbance of staple structure by OFDA2000.

Alpaca fleeces averaged (\pm s.e.m.) clean, dry yield of 79.0 (1.4)%, wax index of 3.2 (0.2)%, suint index of 0.7 (0.1)% and dust index of 7.7 (0.5)%. Alpaca staples were readily spread on the OFDA staple screen and required fibre counts readily achieved for fibre measurements. Average FD, FD variation, fibre curvature, and curvature variation for clean staples and their correlation with the greasy staple measurements are shown in Table 1. Along staple FD characteristics were also successfully measured in both the greasy and cleaned staple but are not presented in this paper.

Table 1. Average FD, FD variation, fibre curvature, and curvature variation for clean staples and their correlation with the greasy staple measurements using OFDA2000

Clean staple	Mean	Range	Correlation with greasy staple measurement
FD (μ m)	26.6	18.2 to 37.5	0.997
FD standard deviation (μ m)	6.3	3.9 to 9.9	0.923
FD coefficient of variation (%)	24.0	19.2 to 35.6	0.883
Comfort factor	70.1	16.4 to 98.9	0.997
Curvature ($^{\circ}$ /mm)	33.4	18.4 to 51.1	0.977
Curvature standard deviation ($^{\circ}$ /mm)	25.3	15.0 to 37.0	0.896

The average difference between clean and greasy staple measurements of FD using OFDA2000 using zero as the "grease correction" factor was 0.56 (0.06) μ m and the linear relationship was

$$\text{Clean staple FD} = 0.985 * \text{Greasy staple FD} - 0.172 \quad (n=48, r^2=0.993, P<0.001)$$

Alpaca fleeces contain significantly less wax and suint than that reported for Merino and other sheep breeds. The OFDA2000 can be successfully used to measure the fibre diameter parameters of non-cleaned alpaca staples but a smaller "grease correction" factor would be required than that currently used for sheep greasy wool staples.

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