WOOLLY FIGURES – ROB CLOSE

KEY POINTS:

1. For optimal results, objective measurements cannot solely be relied upon when breeding Merino sheep for apparel fibre production.
2. Genetic progress towards increased profitability per head and simultaneously improves processing potential of fleece wool is most likely to occur when:
    - The grower has a sound understanding of the biology of wool production
    - The grower has an appreciation for the limitation of objective measurements
    - The grower uses a combination of subjective skills and measurements to make and monitor progress towards breeding goals

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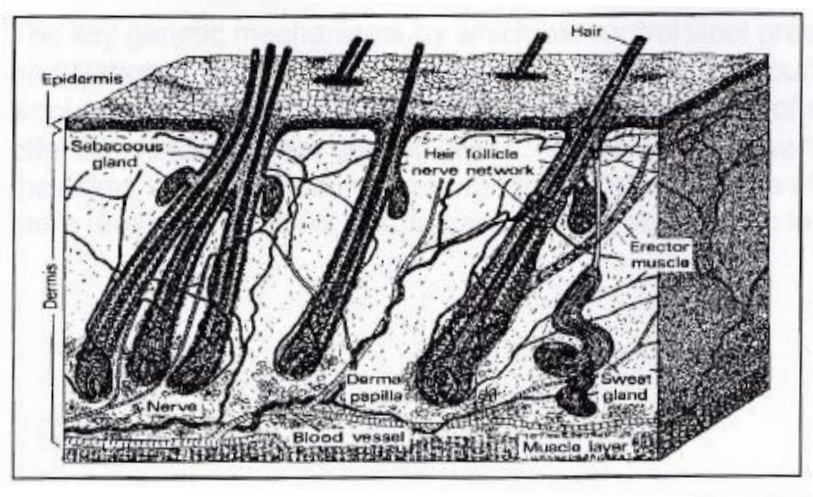
Figure 1: Simplified 3-dimential representation of adult sheep skin.



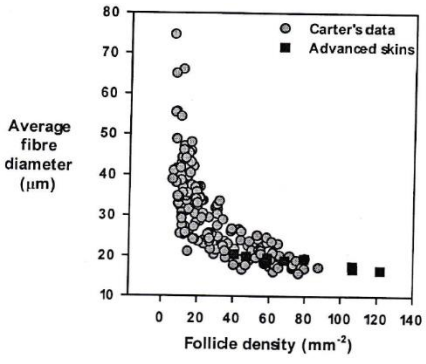
This drawing shows a collection of follicles in the skin. Wool fibres are produced by follicles, which are the tube-like structures shown. The cells which eventually make up the fibre multiply at the dermal papilla and migrate up the shaft of the follicle, changing shape and chemistry to eventually emerge as the wool fibre.

Each follicle has a wax gland (sebaceous gland) attached, which secretes wax into the neck of each follicle, coating both the skin and the emergent fibre. The purpose of the wax is to protect and the surface of the skin – wax acting as a barrier to water and an absorber of UV light.

Broadly, there are two types of follicle in the skin:

1. Primary follicles form first during pregnancy, starting at around day 65 of gestation. Their development is generally complete by day 90 of pregnancy. To complement their sebaceous gland, primary follicles have a muscle attached (the arrector pili) and a sweat gland (suidiferous gland).
2. Secondary follicles are initiated after the primary follicles have been initiated, and usually have completed development by the time of birth. Secondary follicles have only a sebaceous gland as an attachment.

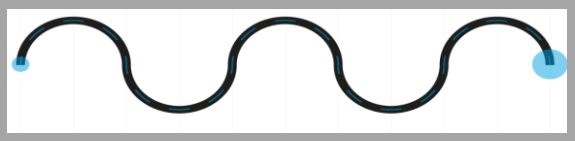
Figure 2: Relationship between density and fibre diameter



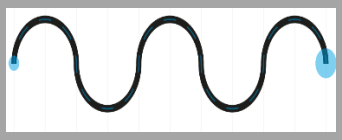
Clearly shows that fibre diameter is a function of follicle density – in other words, to bring about genetic changes in fibre diameter, one needs to change the density of the follicles.

Sheep with low follicle density, such as a primitive and carpet wool sheep, have high average fibre diameter. Genetically fine sheep have high follicle density. Advanced Merino's have moderate – high follicle density.

Note - Curvature tell you how fast and long the wool stable will be, irrespective of the micron.



- **19 Micron – Low curve**
- **100mm in length**



- **19 Micron – High curve**
- **75mm in length**

25% Extra Wool

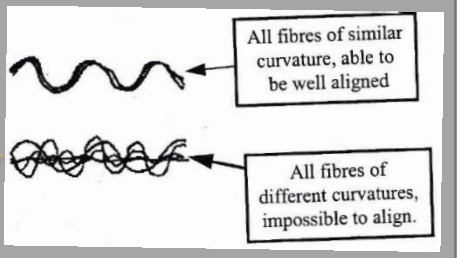
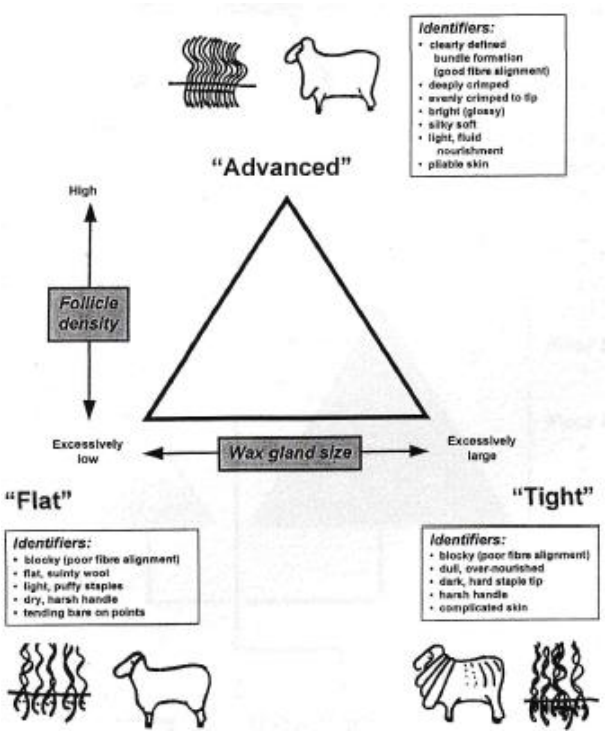


Figure 3: Schematic representation of the skin types within a flock

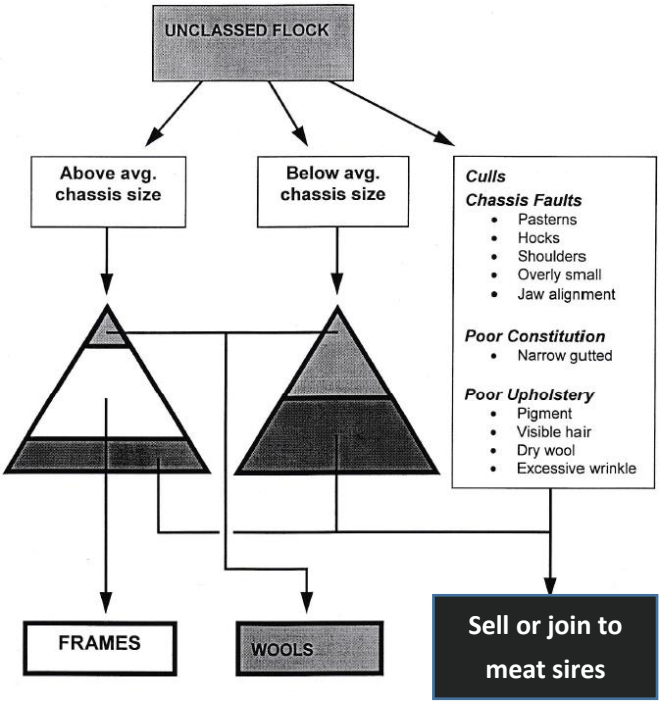


Within each age group in your flock, sheep fit somewhere within this triangle. In most flocks, there is a small number (perhaps 15%) of extremes of any of the 3 skin types (Advanced, Flat and Tight), with around 85% sheep of the sheep falling somewhere in the middle (the 'grey area' sheep). These are the hardest to know what to do with.

Genetic progress towards high fleece value comes from coming off the bottom of the triangle, using rams situated high on the triangle (or from high in the industry triangle), and consequently moving the triangle for the progeny upwards toward an increasingly advanced type.

PRACTICAL FLOCK MANAGEMENT

Knowledge of the skin types within your flock, the basics of which has been outlined above, is the foundation upon which progress towards profitability per head is made – however, we must translate this knowledge into a practical flock management system if this knowledge is to be both practical and beneficial. The flock management system employed must deliver progress improvement in the profitability per head and the generation pass, but also reduce the number of culls occurring in each drop and the susceptibly of sheep to fleece rot. It must also maintain or increase the doing-ability of the sheep, and yet be simple enough to be applied to the extensive grazing operation of pastoral areas of Australia.



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