TIME TO FORM A STAPLE CRIMP?

A.J. WILLIAMS and K.J. THORNBERY

NSW Agriculture, Agricultural Research & Veterinary Centre, Forest Road, Orange, N.S.W. 2800

While there are no satisfactory explanations for the formation of fibre and staple crimp, there has been general agreement with the conclusion of Barker and Norris (1930) that crimp formation represents a periodic function of time, being little influenced by the growth characteristics of the fibres. There has also been acceptance of their evidence that a crimp is formed every 7-8 days, although Chapman (1965), observed that only three quarters of a crimp wave had formed in 9 days.

The present study was undertaken to ascertain the duration of crimp formation and its variation in Merino sheep from flocks genetically different in clean fleece weight (and crimp frequency) as a result of selective breeding for either high or low clean fleece weight per head.

The sheep studied were the progeny of 2 flocks of ewes, obtained after joining Fleece Plus (Fl+) or Minus (Fl-) rams to a flock of medium Peppin Merino ewes. Fl ewes were then joined with either Fl+ and Fl- rams for 3 years. The Fl+ and Fl- flocks are closed and form part of a long term selection experiment. Replacement sheep are chosen on the basis of a high (Fl+) or low (Fl-) clean fleece weight measured at the hogget shearing.

The lambs were weaned when 3-4 months old, and shorn at 8 and 20 months. At 9 months, wool was clipped from midside skin using fine animal clippers. The regrowth wool was harvested just before shearing. These staples provided the wool for measurement of staple length and crimp frequency. The former was measured on 5 staples, and latter at 3 positions (base, middle, tip) on each of 3 staples. The average staple length and crimp frequency were determined, from which the time required to form a crimp in the staples of each sheep was computed. The data were analysed, using a generalised least squares programme - REG (Gilmour 1987).

Table 1. The least square means (± SE) for the days required to form a staple crimp, using progeny from F2 Fl+ and Fl- flocks in 3 years

<table>
<thead>
<tr>
<th>Flock</th>
<th>1988</th>
<th>Year of birth</th>
<th>1990</th>
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</thead>
<tbody>
<tr>
<td>Fl+</td>
<td>10.5 ± 0.6 (20)(^a)</td>
<td>9.8 ± 0.5 (23)</td>
<td>10.3 ± 0.6 (20)</td>
</tr>
<tr>
<td>Fl-</td>
<td>6.3 ± 0.6 (16)</td>
<td>7.3 ± 0.3 (24)</td>
<td>7.4 ± 0.8 (12)</td>
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</tbody>
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\(^a\) The number of sheep is shown within parentheses.

The average time to form a crimp (Table 1) was 8.5 days (SE = ± 0.2). The Fl+ sheep formed crimps more slowly (P<0.01) than Fl- sheep each year, but there was a significant interaction between flock and year (P<0.05). Twin born sheep also required longer to form a crimp than single born (8.8 v 8.4 days, SE =± 0.2. P<0.01).

These observations confirm that, on average, a staple crimp is formed every 7-9 days. However, the duration is variable, being very different in these two flocks which also differed greatly in both clean wool production and crimp frequency, with Fl+ and Fl- progeny producing 4.8 and 1.5 kg clean wool, with 6.1 and 16.9 crimps per 25 mm respectively.


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