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The effects of changing flock structure on the amount and type of turn-off from sheep flocks

By T. Marshall, Adviser, Sheep and Wool Branch

In the past the proportion of mated ewes in Western Australia's sheep flocks carried through summer has averaged about 40 per cent and sheep meat production has been basically lamb and old mutton.

If the proportion of mated ewes was lifted to an average of around 50 per cent and wethers were sold off at an average of about 2½ years old, there would be substantial increases in sheep meat production. The extra meat produced would be young sheep meat ideally suited for table meats for consumers in W.A. and in many overseas countries.

As a result of increasing the proportion of mated ewes, wool production would probably decline slightly but the decrease in wool income would nearly always be more than offset by increases in income from meat production. Changes in labour requirements as a result of running more breeding ewes would be small.

Profitable overseas markets are available for Western Australian sheep and sheep meats. These markets can grow but we are in danger of losing many of them to competitors because we do not produce enough of the type of sheep preferred by the markets.

To keep and expand these markets, Western Australia must increase the supply of sheep for sale and produce the type of sheep required. We can do this by increasing the proportion of breeding ewes in the flock and by selling wethers at a younger age than at present.

For many years only about 40 per cent of the sheep carried through summer have been mated ewes. However, many individual farmers mate more than 50 per cent of their flocks—especially in the wheatbelt. These farmers sell young wethers but usually to other farmers who run

Table I—Production and usage of Western Australian sheep meats, 1973 ('000 tonnes)

<table>
<thead>
<tr>
<th></th>
<th>Mutton</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total production</td>
<td>63.7</td>
<td>18.9</td>
</tr>
<tr>
<td>Exported</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumed locally</td>
<td>24.6</td>
<td>20.5</td>
</tr>
<tr>
<td></td>
<td>3.6</td>
<td>15.1</td>
</tr>
</tbody>
</table>

Sources—Commonwealth Bureau of Census and Statistics and Australian Meat Board.
lower proportions of breeding ewes in their flocks (30 to 40 per cent). These farmers, mostly in the wetter areas, could sell young sheep for meat if they ran more ewes and sold wethers younger.

This article examines likely changes in production and management which will result from running a higher proportion of mated ewes and selling young wethers.

**Present sheep meat production**

At present about 33 million sheep are carried through summer in Western Australia. With about 40 per cent mated ewes and 67 to 68 per cent lambs marked, Western Australia could turn off about 6.5 million sheep and lambs each year without changing the number of sheep remaining. Of the 6.5 million sheep sold, about 1.5 million would be lambs. Virtually all of the remainder would be aged ewe and aged wether.

The production and usage of sheep meats in Western Australia during 1973 is shown in Table 1, which emphasises the importance of the export markets for mutton.

During 1973 more than two-thirds of the mutton produced was exported and over half of that exported was used as table meat by countries where people prefer fresh sheep meat to any other red meat. But most prefer to eat young, meaty sheep rather than the old and often fat mutton they are forced to buy. Recent reports suggest that we could lose these markets if we cannot supply them with young sheep meat.

Manufacturing meats (meats used for sausages, smallgoods, etc.) are an important market, but cannot command as high a price as table meats. They also face competition from artificial meats. It seems clear that increases in production should be aimed at the table meat markets.

In any case, the easy way to produce more sheep meat (by running more breeding ewes) will lead to increases in young sheep meat, not meat from age culls.

**How can sheep meat production be increased?**

The total sheep population of Western Australia cannot increase greatly unless cattle numbers and cropping areas are reduced or there are significant increases in land development. Therefore, unless farmers are willing to run their sheep at higher stocking rates, which seems unlikely, they can only run more ewes by selling wethers younger and running extra ewes in place of old wethers.

It is usually accepted that ewes, if they are lactating for several months, eat more in a year than wethers. This is arguable, but it is usual to assume that a farmer wishing to run an extra 100 ewes would sell 120 to 130 wethers to make way for them.

Accordingly, in this article it is assumed that a breeding ewe is equivalent to 1.3 wethers (that is, her "dry sheep equivalent", D.S.E., is 1.3). Hogget replacements eat less than adult sheep and they have been given a D.S.E. value of 0.9 (Table 2). This means that under
these circumstances any increase in the proportion of breeding ewes in the flock would lead to some decrease in total numbers carried through summer.

However, many factors such as stocking rate, fertility and time of lambing govern just what substitution rate of ewes to wethers can be used. It seems unlikely that it would even be higher than the 1.3:1 used here and in many circumstances it may approach 1:1.

The relationship between the age at which wethers are sold and the proportion of breeding ewes which can be run is represented in Figure 1. The lambing percentage and ages of culling used in constructing this figure are those given in Table 2.

Figure 1 assumes that virtually all wether lambs born in the flock are retained to sell off at the one age.

The overall effect is that selling wethers at a younger age allows the proportion of breeding ewes to be increased. For example, if all wethers are sold off at 5½ years of age about 40 per cent breeding ewes can be run in the flock carried through summer. If the wethers are sold at 2½ years then over 50 per cent breeding ewes can be run.

As wethers are sold younger and the proportion of breeding ewes increases, the annual turn-off (total number sold for slaughter or live export) is increased. This relationship is shown in Figure 2, where the number of sheep available for turn-off each year expressed as a percentage of the total number carried through summer, is graphed against various ages at which wethers can be sold.

If wethers are sold at progressively younger ages and extra ewes run in their place, more wethers can be turned off each year. The increased turn-off shown in Figure 2 is made up mainly of the extra young wethers but the number for cast-for-age ewes for sale also increases because more ewes are being run in the flock. Thus, selling wethers younger allows any desired number of prime lambs to be sold, plus extra young wethers for table meat, and less old mutton.

Figure 3 shows the effects of running more breeding ewes and selling wethers at younger ages on the turn-off of lambs, old mutton and young mutton.

For a range of percentages of breeding ewes in the flock, the diagram shows the percentage of the flock which could be turned off each year as lamb, young mutton or old mutton, and the numbers of lambs, young mutton sheep, old ewes and old wethers that could be turned off from W.A. if the State's sheep population remained at about 33 million and all farmers sold wethers at the ages shown. Individual farmers can

Loading live sheep for export to the Middle East. This market has indicated a preference for young lean sheep meat instead of the over-fat wethers shipped up to the present.
read these figures as hundreds instead of millions from a farm that carries 3 300 sheep and lambs through summer.

From what we know about sheep meat production in W.A. it appears that the average situation has been that wethers are turned off at an average age of 5½ years and about 40 per cent of the total flocks carried through summer have been mated ewes (see Figure 3).

If wethers were sold at an average age of 2½ years, then the total turn-off would increase by about 3 million (or 300 from a farm running 3 300 sheep) and most of this increase would be 2½-year-old wethers.

If this situation was reached, nearly 5 million young wethers, ideally suited for use as table meat locally and in many of the countries that import W.A. meat, would be available for sale. Old mutton, in this case C.F.A. ewes, would still be available for use as manufacturing meats, and lamb production could still be similar to present levels.

This would also mean that the proportion of breeding ewes which could be run would be more than 50 per cent of the total flock—a level which is common in many wheatbelt shires but which is well above that in many Great Southern areas where only 30 to 40 per cent breeding ewes are run.

**Effects on total farm production**

If wethers are sold at younger ages, more breeding ewes can be run instead of old wethers and total meat production increases. The extra ewes required are already available on most farms in the form of excess ewe lambs and hoggets. Also in many cases aged ewes could be kept for an extra year before sale.

This increase in meat production would usually be accompanied by a fall in wool production because more ewes and young sheep would be run in the flock and total sheep numbers would probably fall slightly. These changes in meat and wool production are illustrated in three possible flock structures for a farm capable of running 3 000 D.S.E.'s through summer, shown in Table 3.

The assumptions from which Table 3 was calculated are shown in Table 2.

If the model farm changed from situation A to situation B as shown in Table 3, wool production would fall by about 570 kg but meat production would increase by about 4 200 kg—and most of the increase in meat production would be young sheep suitable for table meat.

The corresponding changes in production by changing from situation A to situation C would be a decrease of about 845 kg in wool production but an increase of some 7 340 kg in meat production.

On this basis, and with normal sheep meat and wool prices, it is more profitable to sell wethers younger and run more breeding ewes in the flock.

In fact, because of the increase in number turned off by selling young wethers and increasing the proportion of breeding ewes in the flock, farm income would not fall even if young wethers were sold at a lower price than has commonly been received for old wethers, many of which are now sold for live shipping.

The relationship between the break-even prices of young and old wethers is shown in Figure 4. The figure demonstrates that if 1½-year-old wethers can fetch $7.00 then old wethers must fetch over $10.00 for it to be worthwhile keeping them and if 2½ year olds fetch $8.00 then the break-even price...
Table 3—Flock structures and productivity from a farm unit running 3000 D.S.E.'s through summer but selling wethers at various ages

<table>
<thead>
<tr>
<th></th>
<th>A. 40% ewes</th>
<th>B. 53% ewes</th>
<th>C. 63% ewes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sell 5½ Y.O. wethers</td>
<td>Sell 2½ Y.O. wethers</td>
<td>Sell 1½ Y.O. wethers</td>
</tr>
<tr>
<td>Base flock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ewes</td>
<td>1 100</td>
<td>1 418</td>
<td>1 650</td>
</tr>
<tr>
<td>Ewe replacements</td>
<td>265</td>
<td>340</td>
<td>400</td>
</tr>
<tr>
<td>Wethers</td>
<td>1 039</td>
<td>418</td>
<td>515</td>
</tr>
<tr>
<td>Wether replacements</td>
<td>295</td>
<td>440</td>
<td>2 727</td>
</tr>
<tr>
<td>Rams</td>
<td>28</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>Total carried through summer</td>
<td>2 727</td>
<td>2 652</td>
<td>2 606</td>
</tr>
<tr>
<td>Purchases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rams</td>
<td>7</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Lambs reared</td>
<td>748</td>
<td>964</td>
<td>1 122</td>
</tr>
<tr>
<td>Total wool shorn</td>
<td></td>
<td>13 540</td>
<td>12 700</td>
</tr>
<tr>
<td>Sales</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cull ewes</td>
<td>183</td>
<td>235</td>
<td>277</td>
</tr>
<tr>
<td>Wethers 5½ Y.O.</td>
<td>228</td>
<td>397</td>
<td>489</td>
</tr>
<tr>
<td>2½ Y.O.</td>
<td></td>
<td>9 930</td>
<td>11 000</td>
</tr>
<tr>
<td>1½ Y.O.</td>
<td></td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>Lambs</td>
<td>133</td>
<td>136</td>
<td>18 150</td>
</tr>
<tr>
<td>Total meat produced</td>
<td>1 530</td>
<td>1 565</td>
<td>15 150</td>
</tr>
</tbody>
</table>

for old wethers would be at least $11.00 per head.

Or if young mutton is fetching 28-33c/kg (12½-15c/lb) then the break-even price required for old mutton would be 33-37c/kg (15-17c/lb).

In calculating these break-even prices, allowance has been made for decreased wool production and increased costs as a result of running an increased proportion of ewes in the flock. If a proportion of the young animals are shippers, and many buyers are already paying the same prices for 2- and 4-tooth wethers for live export as they are for old wethers, then the increase in profitability is considerable.

Many producers claim that increasing the proportion of breeding ewes in the flock will lead to big increases in labour demands.

However, on a farm basis the increase in labour requirement is not large and may be only slight. For instance, if a farm running about 3000 D.S.E.'s through summer (Table 3) increased its mated ewes from 40 per cent to over 50 per cent and sold wethers at 2½ years old instead of 5½ years old—

- ewe numbers would increase by about 300;
- wether numbers would decrease by about 600;
- lambs reared would increase by about 200;
- weaners carried through summer would increase by about 220;
- total sheep numbers carried through summer would decrease by about 80;
- the number of sheep sold would increase by about 200.

All the increases in labour requirement would be in areas where there is already a requirement. No new farm jobs would be created. If a farmer ran 770 extra ewes and 1 000 less wethers, much of the extra work on the ewe side would be balanced by less work on the reduced number of wethers.

References

Fig. 4.—"Break-even" prices required for old wethers at specified prices for young wethers

![Graph showing break-even prices for old wethers](https://example.com/graph.png)