INTRODUCTION

"High reproductive rates are critical for maximum herd profitability in Southern Australian herds where the major marketing emphasis is on a low turnoff age and hence a high turnoff rate" (Entwistle 1983).

Beef producers in the Benalla district of north east Victoria rarely practice management strategies to maintain high fertility in their breeding herds. This is evidenced by the low level of reproductive performance in beef herds in the district (Sykes and Ada 1980). Trapnell and Ada (1981) found that beef producers do not consider fertility to be a problem in their herds. However, they found that producers did not know accurate calving percentages or the number of breeders in their herds.

Reproductive performance has been defined in a number of ways. Mosman (1978) expressed it in terms of pregnancy rate over a limited period of time. He set a target of 90 to 95 percent after 49 days with a maximum calving span of 60 days, while Donaldson (1970) expected a 95 percent branding rate over a 45 day period.

McPhail and Mosman (1981) believe concentration of calving pattern rather than reduction in calving span results in economic benefits and contributes most to management advantages. They define calving pattern as the percentage of cows calving every 21 days and calving span as the length of time over which calving takes place. In an annual pasture situation where there is a prolonged dry period in summer and autumn, such as in the Benalla district, concentration of calving pattern and reduction in calving span could both be important.

Sykes and Ada (1980) chose a reproductive performance of 95 percent of cows calving to cows joined in nine weeks, with 65 percent calving in the first three weeks, as an achievable "target" for producers in the Benalla district. Ada, Sykes and Stafford (unpublished) found a potential loss of weaned calf of 38 kg. per cow mated in herds not achieving this 'target' performance.

The following papers focus on a management package which beef producers can adopt to improve reproductive performance in their herd.

THE RELATIONSHIP BETWEEN REPRODUCTIVE MANAGEMENT PRACTICES AND HERD REPRODUCTIVE PERFORMANCE IN BEEF BREEDING HERDS IN N.E. VICTORIA

A.E. LOTTKOWITZ + and R.W. STAFFORD

BACKGROUND

Recent surveys have found low reproductive performance in beef herds in the Benalla district (Sykes and Ada (1980), Shiel et al (1983, unpublished)). Few have examined the reasons for this poor performance.

This paper reports a survey of beef breeding herds which examined the relationship between management practices and the level of reproductive performance.

+ Department of Agriculture, Benalla, Vic. 3672.
Twenty-one beef herds were randomly selected from 400 herds in the shires of Benalla, Oxley and Wangaratta. The herds had between 50 and 500 breeders, were situated between the 635 and 760 mm rainfall isohyets, and were confirmed free of brucellosis.

The survey was conducted in 1982, by personal interview. It collected information on the whole beef enterprise throughout one complete reproductive cycle, from joining in 1981 to calf weaning in 1982/83.

RESULTS AND DISCUSSION

The beef enterprise

Eighteen of the farmers interviewed produced weaners or vealers to be sold between November and January each year. The other three turned off fat steers or bullocks at two to four years of age, from their beef breeding enterprise.

There was a wide variation in herd size, cattle stocking rates and time of calving. In March 1981, cattle stocking rates on surveyed farms ranged from 3 to 22 dry sheep equivalents (DSE)/ha, averaging 11.5 DSE/ha. The average herd size was 117 breeders. By January 1983, both the average stocking rate and herd size had decreased by 30 percent. This change may be attributed to the effects of a major drought, and is consistent with the recent reduction in the Victorian herd (ABS Rural Stats. 1981-83).

The time of calving varied from a six week period in February/March, to two herds which calved all year round.

Thirteen of the producers employed some type of cross-breeding programme. Crosses were frequently made at random, with farmers reasoning that cross-bred cows produce better vealer calves than do purebred cows.

Reproductive management

(i) Bull management: Only one producer bred replacement bulls for his own herd. He was also the only one who objectively examined bulls before joining for breeding soundness. The criteria he used for selection of sound bulls included testicle circumference and consistency, a visual appraisal and soundness of the feet.

The bull mating ratio for the 1981 joining period varied between 1.6 and 5.4 percent, the average being 3.1 percent. Fourteen of the farmers used a single bull over each mob at joining.

Eight of the twenty-one respondents had rotated bulls between mobs during joining. However, only four of these rotations were made as a conscious management decision. The other four farmers rotated the bulls due to circumstance, e.g. the season, lameness or inability to work.

(ii) Cow and heifer management: One third of the producers managed cows and heifers separately at joining. Most commonly, heifers were joined later than cows, allowing them to 'grow out' before being joined. The time allowed for this extra growth varied from three weeks to six months.
Heifers joining periods were three to nine weeks shorter than that for cows. Only one farmer consciously used the shorter joining period as a method of eliminating late calvers from his breeding herd.

Seventeen farmers had maiden heifers to join in 1981. Age at first joining varied from 15 to 27 months with only three farmers joining maiden heifers at 15 months. Many producers did not know the exact age of heifers at first joining because of the extended joining and calving periods.

Six farmers did not cull any cows or heifers before joining in 1981. For those who culled cows, the major criteria were age and the ability to rear a calf.

One quarter of the respondents culled heifers before joining, primarily on the basis of temperament. Calf quality, a reduction in herd numbers and selection for the herd standard were other reasons given for culling heifers. Two farmers joined more heifers than were required as replacements. Empty heifers were culled before calving.

One respondent performed pregnancy diagnoses on all joined cows and heifers 12 weeks after the end of the mating season. Three other farmers used their local veterinarian to check the pregnancy status of the last few females towards the end of calving.

Herd performance

(i) Calving characteristics: Table 1 summarises the reproductive performance found in the survey herds for the 1982 calving season.

Table 1  Reproductive performance for the survey herds (1982)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Calving span</th>
<th>Survey average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;13 weeks n=5</td>
<td>14-26 weeks n=11</td>
</tr>
<tr>
<td>Calving span</td>
<td>av. 11</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>range 8-13</td>
<td>17-21</td>
</tr>
<tr>
<td>Calving pattern</td>
<td>av. 29</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>range 15-39</td>
<td>13-48</td>
</tr>
<tr>
<td>% in first 3 wks</td>
<td>av. 67</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>range 53-85</td>
<td>33-82</td>
</tr>
<tr>
<td>% in first 9 wks</td>
<td>av. 79</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>range 72-89</td>
<td>55-97</td>
</tr>
</tbody>
</table>

Sykes and Ada (1980) set a target calving performance of 95 percent in a nine week period, with 65 percent within the first three weeks.

This survey found the performance of 21 herds -to be 57 and 31 percent in nine weeks and the first three weeks of calving, respectively.

Overall calving percentage was depressed by five percent for herds which calved for more than a 26 week period. Many producers joined cows over an extended period in the belief that any calf, even a late one, is better than no calf at all. Figures from the survey (Table 1) dispel this belief and show that the late calf is not even produced.
The relationship between herd performance and reproductive management practices

Figure 1 demonstrates the difference in calving span between respondents who adopted or did not adopt a number of management practices.

<table>
<thead>
<tr>
<th>Management practice</th>
<th>Adopted</th>
<th>Not Adopted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controlled joining</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Individual identification of breeders</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Use of records for management</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Overmatting, bull examination, preg. test</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

Fig. 1 The influence of various management practices on calving span

*average is taken from a small number who adopted or did not adopt a particular practice

+ only two farmers adopted these practices.

The results of this survey indicate that calving span decreases, and overall calving percentage increased with a greater adoption of reproductive management practices.

A PRODUCTIVE MANAGEMENT PROGRAMME TO IMPROVE REPRODUCTIVE PERFORMANCE IN AUTUMN CALVING BEEF HERDS

R.W. STAFFORD+ and W.E. SYKES*

BACKGROUND

Sykes and Ada (1980) conducted a survey to establish present levels of reproductive performance in beef breeding herds in the Benalla district of N.E. Victoria. A similar survey collected data on reproductive performance in 1983 (Shiel et al., unpublished). In addition, a productive management programme (PMP) was conducted in four "action" herds from 1980 to 1983.

The programme was conducted as a team effort with the co-operating producer, a private and a government veterinarian and a beef extension officer. One feature of the programme was to provide each co-operator with individual advice especially suited to his enterprise. The aim was to achieve improved reproductive performance in each herd.

This paper outlines a productive management programme for autumn calving beef herds, and the consequent changes in herd reproductive performance over a three year period.

PRODUCTIVE MANAGEMENT PROGRAMME

This programme consists of a seven point package of management strategies. Taken individually, the strategies may not greatly alter herd performance, however, when used collectively in a management system, they can result in large improvements in herd reproductive performance.
Identification

A permanent identification system is required for recording the annual performance of individual cows.

Management recording

Simple, individual cow management records are an essential component of PMP and should include:
- identification number
- bull to which mated
- date bull in/date bull out
- result of pregnancy diagnosis
- calving date (within a week)
- sex of calf

From these records calving histograms are constructed to show the performance of each mating group. Sub-optimal performance in any group can be examined in conjunction with details on the nutritional or disease status of the group. Reasons for the lowered performance can then be established and corrective management planned.

Management of replacement heifers

This is the major factor in the success of PMP and is particularly important if maiden heifers are joined to calve at two years of age. There are a number of strategies which make up good heifer management. These can be divided into nutritional and mating aspects.

(i) Nutritional management. There are two critical periods in the nutritional management of heifers. The first is the period from weaning at 8-10 months of age until joining at 14-15 months, when the heifer group should be fed and managed to reach an average liveweight which ensures an 84 percent conception rate in a six week joining period. This is called the critical mating weight for that property (Mosman 1978).

The second critical feed period for heifers occurs from before calving, until the end of the following joining period. The weight and body condition of heifers is monitored and adequate nutrition provided to allow for lactation, oestrus and body growth of the first calf heifer.

(ii) Mating management. The aim of mating management is to have heifers conceive early in the joining period, calve early at first calving and remain early calvers throughout their breeding life.

This was achieved by overmating heifers by 15-20 percent for a limited six week joining period, three weeks before the main breeding herd. With overmating, only those heifers which conceive in the limited joining period remain in the breeding herd.

Joining heifers early allows them to calve early in the season. When these heifers are subsequently re-joined at the same time as the cows, it allows three weeks extra time for the prolonged anoestrus without affecting their future as early calvers.
Cow management

Mature cows provide a "buffer" in the nutritional management of the herd. If pasture is limiting they can be stressed with least effect on subsequent reproductive performance. However, they should not be allowed to fall below condition score 2 between calving and joining, or their fertility may be impaired.

Controlled mating management of mature cows to eventually achieve a 63 day joining is important. Joining periods were planned after analysis of the calving histograms, with strict attention given to dates of "bull in" and "bull out".

Pregnancy diagnosis (PD)

In the initial 12 months of PMP, an accurate PD six weeks after joining is essential to concentrate calving and avoid the costly carry-over of non-pregnant breeders. In subsequent years, early PD for heifers remains important, however, for cows it may be sufficient to PD at weaning.

Bull management

Physical condition of bulls is monitored throughout the year and a premating examination is made for breeding soundness. This should include at least a test of the serving ability of each bull.

Bulls should be observed during joining to enable early detection of any breakdown or injury.

Animal health programme

A strategic preventative animal health programme is an integral part of PMP, and should be planned for individual properties in consultation with a private veterinary consultant.

EVALUATION OF THE PRODUCTIVE MANAGEMENT PROGRAMME

Reproductive performance

Results from the survey of autumn calving herds (Sykes and Ada (1980)) confirmed suspicions that reproductive performance was sub-optimal in beef breeding herds in the Benalla district. The means and ranges in reproductive performance of 30 of these control herds are set out in Table 2.

Table 2 Reproductive performance in 30 control herds in 1980 and 1983.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Calves born in 3 weeks (%)</td>
<td>44</td>
<td>5 - 74</td>
<td>40</td>
<td>13 - 95</td>
</tr>
<tr>
<td>Calves born in 9 weeks (%)</td>
<td>70</td>
<td>20 - 96</td>
<td>67</td>
<td>23 - 94</td>
</tr>
<tr>
<td>Total calving rate (%)</td>
<td>99</td>
<td>69 - 100</td>
<td>82</td>
<td>46 - 100</td>
</tr>
<tr>
<td>Calving span (weeks)</td>
<td>20</td>
<td>7 - 35</td>
<td>17</td>
<td>9 - 20</td>
</tr>
</tbody>
</table>

The individual performances of three of the four "action" herds is detailed in Table 3. One "action" herd withdrew from the programme soon after it began due to a misunderstanding of the commitment required in PMP.
Table 3 Reproductive performance in three "action" herds from 1980 to 1983.

<table>
<thead>
<tr>
<th>Action herds</th>
<th>Year</th>
<th>'80</th>
<th>'81</th>
<th>'82</th>
<th>'83</th>
<th>'80</th>
<th>'81</th>
<th>'82</th>
<th>'83</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calves born in 3 weeks (%)</td>
<td>23 42 68 -</td>
<td>27 26 51 47</td>
<td>32 60 72 69</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calves born in 9 weeks (%)</td>
<td>58 75 84 81</td>
<td>64 76 82 77</td>
<td>72 78 95 91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total calving rate (%)</td>
<td>71 64 84 81</td>
<td>76 89 86 83</td>
<td>94 80 97 91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Calving span (weeks)</td>
<td>18 12 9 9</td>
<td>25 15 13 12</td>
<td>26 16 12 9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that the reproductive performance in each of the "action" herds in 1980 was typical of the performance in the 31 control herds during 1984.

Initial reduction of calving span in each "action" herd was achieved by different strategies. One herd culled all non-pregnant or late calvers on PD results, while another carried over for joining the following year, any young and/or good producing, late calving or non-pregnant females.

The reproductive performance in the three "action" herds shows considerable improvement from 1980 to 1983 compared with the control herds over the same period (Tables 2 and 3). Two of the "action" herds improved both calving pattern and span up to, and better than, target levels. Only one herd reached the target calving percentage, but not within a nine week joining.

The effect of the drought in 1982/83 can be seen in the calving performance for 1983. One herd had a very low conception rate in a mob of Simmental crossbred females due to low body condition at joining. Another herd lost five percent of calves from dystocia after the drought had broken.

Herd production

The changes in herd production can be seen by the improvement in the weaning weights of the heifers retained for replacements.

The weaning weights of the replacement heifers from the two "action" herds which practiced two year old calving are set out below in Table 4.

Table 4 Average weaning weights of replacement heifers during the PMP

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>wt (kg)</td>
<td>n</td>
<td>wt (kg)</td>
</tr>
<tr>
<td>Herd A</td>
<td>7</td>
<td>226</td>
<td>35</td>
<td>240</td>
</tr>
<tr>
<td>Herd C</td>
<td>29</td>
<td>231</td>
<td>49</td>
<td>252</td>
</tr>
</tbody>
</table>

The average weaning weight of replacement heifers improved in both herds in all years except 1983, when the drought reduced production considerably.

In addition the proportion of the heifer drop suitable for replacements increased in herd A as indicated by the increased number of heifers retained. Herd C required larger numbers only in 1981 following a heavy initial culling.

Kilograms of weaned beef per cow joined is the real indicator of the value of PMP (Table 5). This measure accounts for changes in each parameter of reproductive performance and is calculated from the weaning weights of replacement heifers. It assumes that the weaning weights of the replacement heifers is an indication of the changes in overall herd weaning weights.
Table 5. Kilograms of weaned beef produced per cow joined in two herds in the PMP

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Herd A</td>
<td>160</td>
<td>207</td>
<td>219</td>
<td>199</td>
</tr>
<tr>
<td>Herd C</td>
<td>217</td>
<td>202</td>
<td>259</td>
<td>219</td>
</tr>
</tbody>
</table>

PMP has resulted in an increase of 52 kg and 42 kg of weaned beef per cow joined in herds A and C respectively to 1982. This compares favourably with the potential increase of 38 kg predicted by Ada, Sykes and Stafford (1981, unpublished). Both these herds have achieved a concentrated calving pattern and span, but further improvement in herd production is possible when the target calving percentage is achieved.

PRODUCTIVE MANAGEMENT PROGRAMME: A VETERINARY PRACTITIONER’S ROLE

G.N. WITHERS

This paper outlines the role private veterinary practitioners can play in productive management programmes (PMP) for beef cattle herds. It reports the integration of PMP with existing private veterinary services in two herds near Wangaratta.

PRACTICAL REQUIREMENTS OF PMP

An initial meeting held with each co-operator was used as a bilateral familiarization exercise in which aims and constraints of the producer and the management programme were clarified. With future co-operators, a total farm profile collected at this initial stage may be useful in integrating PMP with other farm enterprises.

A commitment was also required from each co-operator to supply and maintain a permanent, individual animal identification system, and to collect and record management data crucial to the operation of PMP.

Analysis of management records

(i) Assessing performance. The aim of PMP is to identify all types of production losses from joining to weaning.

Herd performance is assessed in terms of the number of females joined. This is calculated from the number of females originally joined, less any sold for reasons other than infertility. Other losses should be identified and included in management records, e.g. dead calves and if applicable the number of pregnant cows sold before calving.

Performance can be assessed by three parameters:-
* calving percentage
* losses between calving and weaning
* calving span and pattern

Each can be significant losses to the producer in kilograms of beef.

The first two parameters are readily appreciated by producers, but the last is frequently not recognised (Trapnell and Ada, 1980) and has received much attention in PMP.

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(ii) Calving histograms. Analysis of calving pattern and span is best done using calving histograms as shown below (Figs. 2 and 3). Performance can be assessed for individuals, mating groups and the entire herd using information in the histogram.

![Fig. 2. Histogram of an ideal herd with 95% cows joined calving over nine weeks with 60% in the first three weeks](image1)

![Fig. 3. Histogram of Herd B (240 females joined including heifers) before start of PMP in 1980](image2)

Mating management

(i) Heifers. Management of replacement heifers is the key to a concentrated calving pattern. These principles have been outlined in an earlier paper.

(ii) Cows. The calving span and pattern of an adult cow herd can be concentrated in a number of ways. One easy method is to replace all late calvers in the herd with early calvers. This may not always be practical, so one of the following techniques may be more appropriate.

The start of joining can be delayed to increase the number of cows cycling in the first three weeks of the joining season. This concentrates calving in the first three weeks, and reduces the calving span. Having concentrated the calving pattern and span around the average calving date, the joining period can be altered by one week per year until the herd starts calving at the desired time.

In some cases it is preferable to hold late calvers over for rejoining the next season, so they calve early the following season. However, this causes a loss in production for one year.

In cow management, condition scoring (CS) on a 0 to 5 scale is used to monitor nutritional status of the herd. From calving until after joining, mature cows and maiden heifers should be maintained in CS 2 to 3. This is an important pre-requisite for good fertility and calf performance.

(iii) Bulls. Physically fit bulls are an equally important part of PMP and an annual pre-joining examination of all bulls is recommended. This examination includes palpation of external genitalia and examination of feet and limbs for potential causes of lameness. In addition, observation of the serving ability of each bull is used to check for the following abnormalities of the penis.
including haematomas, lacerations and corkscrewing, back injuries; lameness and libido.

Most bulls passing this examination are capable of serving 40 to 50 females in a nine week period. Bulls should be in CS 3 to 3.5 at joining. Frequent observation of bulls during the joining season is important, and a spare bull for immediate use in the event of breakdown is a wise investment.

Pregnancy testing

Pregnancy testing can be done accurately on females any time six weeks after conception. Histograms of the anticipated calving pattern can then be drawn up for analysis of herd performance.

(i) Heifers are tested 12 weeks after the start of joining. The term of pregnancy is estimated as resulting from conception in the first or second cycle of the joining period. Empty heifers are culled.

(ii) Cows. Initially the same policy had been adopted for cows, however because joining periods extend beyond six weeks cows found not pregnant at the first test are retested six weeks after the bulls have been removed. Once a concentrated calving pattern is achieved in the cow herd, consideration can then be given to pregnancy testing the cow herd at weaning only. Since it is normal practice in many herds to only allow empty cows to rear their calf until weaning, this alternative can save on extra muster.

Preventative animal health strategies

Preventative animal health strategies are encouraged as an integral part of PMP. Recommendations may vary from year to year according to local knowledge and conditions, but the more important aspects in our area are detailed below.

(i) Grass tetany. Liaison with Department of Agriculture to provide an early warning alert, enabling producers to implement preventative measures before deaths occur.

(ii) Parasite control. Periodic use is made of faecal egg counts to assess infestations and to develop drenching programmes for individual farms.

(iii) Clostridial diseases. Vaccination of calves twice, four to six weeks apart is recommended, together with annual boosters for breeding females.

(iv) Abortions and deaths. Post mortems and abortion investigations are encouraged both to ascertain the cause and to monitor control measures, e.g. drenching programmes.

Programme review and planning

Informal discussions and meetings between the co-operator, beef adviser and veterinarian review the progress of the herd and plan future management strategies.

(i) Herd reproductive performance. The most recent calving performance and pregnancy test results from the previous joining are reviewed. This includes individual bull performance, anticipated and actual calving patterns, options for empty cows and causes of calf losses. Individual cow records are essential to provide this detailed information.
(ii) **Mating management.** Herd management for calving and the next joining season is planned. This includes total numbers to be joined, proposed mating groups, use of available bull power, maiden heifer management and proposed joining dates.

(iii) **Animal health.** Reappraisal of preventative animal health strategies is conducted annually and appropriate strategies planned.

(iv) **Cattle handling.** Planning of proposed cattle handling procedures to minimise costs and labour is an important part of PMP.

Written summaries of the major decisions and items discussed are sent to each co-operator for future reference and reinforcement.

**LIMITATIONS TO PROGRESS**

The 1982/83 drought introduced new problems and alerted us to potential difficulties which may limit the implementation of PMP. During the drought calving groups were run together and the need to feed daily disturbed the cattle, making it difficult to individually identify cows and their calves. In addition, producers were busier than usual so record keeping suffered some inaccuracies. Practical problems associated with grain feeding and budgeting both fodder and financial reserves became a high priority.

Initially co-operators expressed reservations about some aspects of PMP (e.g. reluctance to join heifers separately from cows and restriction of joining periods). With time, the policies which were initially rejected are being introduced by the co-operators as they integrate PMP with their own aims in beef production.

**THE BENEFITS OF A PRODUCTIVE MANAGEMENT PROGRAMME TO THE BEEF PRODUCER**

R.J. KERR+

Over the last three years the productive management programme (PMP) has changed our rather tatty beef operation into one which is both efficient and productive. Poor seasonal conditions, increased stock numbers and low market prices forced us to make some hard decisions which allowed us to achieve this change.

**FARM OPERATION**

The family company conducts a mixed farming operation on a 400 ha property situated on red clay loam flats between the King and Ovens Rivers near Wangaratta in north east Victoria. The annual rainfall is 625 mm, most of which falls in winter and spring.

Cropping and beef production are our two major enterprises. Wheat, oats and lupins are used in a crop rotation generating about 60 percent of nett farm income. Annual pastures and crop stubbles are the major sources of feed for the beef operation. In addition, 20 ha of irrigated lucerne is grown for hay production or opportunity fattening store lambs or steers. Our major cattle operation is a self-replacing commercial herd of Angus cows.

The cows calve in early autumn to produce calves for the vealer market at 8-9 months of age. Our eventual aim is to produce vealer carcasses weighing approximately 160 kg with a 6-9 mm fat cover. However, recent poor seasons have

---

+ "Buffalo View" Milawa, Vic.
made it difficult to produce the desired carcasses at this age, so steers have been grown out to 325-350 kg liveweight for slaughter at 12-15 months of age.

BEEF HERD MANAGEMENT

The herd is managed to achieve a concentrated calving at the most appropriate time for our property. This produces an even line of saleable calves and reduces the amount of time taken to manage the herd.

The programme involves separate management for each class of cattle to ensure they receive suitable feeding and management.

Weaner heifers

Weaner heifers are the future breeders of the herd and need to be given special attention. Consequently, after weaning in January they are given the best feed available ensuring the average liveweight of the group is 275-280 kg by the first week in May, ready for joining. Before joining, five to ten percent of heifers are culled for poor temperament, conformation, weight, frame or condition and fattened for sale.

Heifers are joined for six weeks, three to four weeks before the main breeding herd. The early joining is vital for successful rejoining of heifers the following year. Since the heifers calve during the dry autumn they require extra time to recover before being joined with the main breeding herd for their second calf. Pregnancy testing is conducted six weeks after the bulls are removed. Empty heifers are culled, and fattened ready for sale when prices are suitable, usually on the late winter market.

Once the heifers are in-calf they have to fend for themselves until two months before they start to calve.

First calf heifers

Heifers start calving in February and are kept close to the yards on good feed, water and shade. It is important to keep them in good condition, but not fat (condition score 3) so they can milk well and start cycling soon after calving. These heifers also have to grow after they calve, so first cut lucerne hay may have to be provided as supplementary feed. One advantage of calving heifers early, is that labour can be concentrated on them, before the cows are calving and cropping operations commence.

Heifers are assessed on the performance of their first calf, and poor producers are culled.

COWS

In the initial year of the programme it was decided to cull all the old late calving cows and replace them with young, early calving cows. This changeover was achieved over a ten month period for an additional replacement cost of $51 per cow.

Cow management is now easier as all cows calve between early March and early May. This is our period of greatest feed shortage but provided cows calve in condition score 3, supplementary feeding can be minimised.

First cut lucerne hay is provided as a feed supplement to ensure cow
Cows are joined from the first week in June for a nine week period during which we aim to hold, or slightly improve their condition to ensure good conception rates. Having a large proportion of cows calving early allows us to rejoin the cows before the worst of winter (July).

The cow herd is pregnancy tested 12 weeks after the start of joining. Late pregnant and empty cows are run as a separate mob, and pregnancy tested six weeks after the end of the joining season. The second diagnosis identifies cows conceiving in the last three weeks of the joining period. All empty cows are isolated and sold when the opportunity arises.

**Bulls**

Breeding soundness examinations are conducted on the bulls during March. This examination includes a serving ability test and a physical examination of feet, legs, testicles and penis. If any replacements are required they can be purchased well before joining commences.

**Herd health**

All stock are drenched for worms at weaning time in January. Weaner heifers and first calf heifers are drenched again at joining, to ensure worms are not limiting performance.

Calves are given the first 5-in-1 vaccination against Clostridial diseases at marking, with a follow-up six weeks later. The cows are given an annual booster vaccination at weaning.

Grass tetany can be a problem from May to August, during which time preventative measures are used. Causmag is fed out on hay, and cattle handling is kept to a minimum.

Leptospirosis was detected in four heifers in 1981, after they were pregnancy tested positive, but failed to calve. Since then, a vaccination programme has been introduced for replacement heifers. Two vaccinations are given, four weeks apart, the latter coinciding with the pre-joining drench in April.

**Records**

Our recording system is fairly simple. It consists of a paddock book containing information such as cow number, calf number, birth date and sex of calf, and any comments on calving difficulty.

Cows are checked daily for new calves, which are tagged and recorded at birth. This calving record is used to construct calving histograms for individual mobs, and to examine individual bull performances.

Records of joining dates, cow numbers in each mob, and heifer weights are also kept to monitor both individual and herd performance.

**ADVANTAGES OF PMP**

The two advantages of this programme are improved herd performance and better farm management.
Herd performance

In the three years we have been in the programme the reproductive performance of our herd has improved considerably (Table 3, herd A).

As a result of PMP a larger, more even line of heavier calves are produced at weaning. This is shown in the improved weaning weights and increased number of replacement heifers retained for our breeding herd (Table 6).

Table 6 Liveweights at weaning and joining, and subsequent conception rates of heifers (1980-1983)

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<tr>
<td>n</td>
<td>226</td>
<td>240</td>
<td>252</td>
<td>238</td>
</tr>
<tr>
<td>Weaning wt. (kg)</td>
<td>-</td>
<td>284</td>
<td>279</td>
<td>263</td>
</tr>
<tr>
<td>Joining wt. (kg)</td>
<td>-</td>
<td>91</td>
<td>87</td>
<td>81</td>
</tr>
<tr>
<td>Conception rate in 6 wks. (%)</td>
<td>-</td>
<td>77</td>
<td>81</td>
<td>81</td>
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</tbody>
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Farm management

Our farm operation is both diverse and intensive. Only one full-time labour unit is available, consequently labour efficiency is a high priority.

Improved farm management has been achieved with PMP through:-
* a reduction in cattle handling and musters
* improved labour efficiency, especially with casual labour
* better management records on which to base decisions
* improved cash flow management.

Three years in PMP has seen considerable improvement in both herd performance and farm management. We still have room for further improvement, most notably in total calving percentage.

SUMMARY

R.W. STAFFORD and W.E. SYKES

These papers have shown that reproductive performance in beef breeding herds in the Benalla district of N.E. Victoria is considerably lower than the target levels. Within these herds there is a low adoption of reproductive management strategies. The PMP has demonstrated substantial improvement in herd reproductive performance. This has resulted in practical benefits to the beef producer in both farm management and total herd production.

REFERENCES