THE USE OF PROGESTAGENS TO PREVENT PREGNANCY IN PASTORAL CATTLE

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SUMMARY

The efficacy of two progestagens, medroxyprogesterone acetate(MAP) and melengestrol acetate(MGA),in delaying pregnancy in cattle were compared on Ord River Station in the Kimberley region of Western Australia. Four hundred cows of mixed age were used in treatments of 5OOmg MAP,6Omg MGA and 90mg MGA, given as a single dose injected subcutaneously, and a control group. Pregnancy and lactational status were determined at approximately 7 month intervals over 2 years.Both agents were effective in delaying pregnancy for 6 to 8 months at the doses used. However, some cows that were in the third trimester of pregnancy when treated had mummified foetuses at the end of the experiment.
Keywords: progestagens, pregnancy, parturition, cattle.

INTRODUCTION

We have attempted to find a simple means of preventing pregnancy for six to eight months in cattle run under extensive pastoral conditions. Such a technique could be used to allow young heifers to grow sufficiently to survive the stress of pregnancy and lactation.It could also be an acceptable alternative to spaying older cows to allow their condition to be improved in readiness for marketing.

In previous experiments (Surjoatmodjo et al. 1986) a depot formulation of medroxyprogesterone acetate (MAP), Promone E (Upjohn), was shown to suppress oestrus for up to nine months without any effect on subsequent fertility of the treated animals. Another progestagen, melengestrol acetate (MGA, Upjohn) has been widely used in feedlot cattle in the USA to suppress oestrus in heifers and improve weight gain and feed efficiency (Lauderdale 1983). It is considered to be more potent than MAP,is more potent in cattle than in other species, and, when given orally, a 48-hour withdrawal period prior to slaughter is acceptable to the FDA.

In the pastoral areas of Western Australia many young heifers become pregnant under the prevalent, uncontrolled mating-conditions, as a result of the nutritional flush of the wet season which usually spans the months of December to April. In the subsequent dry period small heifers are unlikely to begin cycling but those grown through the wet season may reach sufficient body size for puberty to occur. A formulation which suppresses oestrus for six to eight months when administered before the onset of the wet season might be sufficient to increase the survival rate of heifers and enable older animals to reach marketable weight. Animals which are pregnant at this time might also benefit from oestrus suppression following their lactational anoestrus because this would delay conception and enable further growth or weight gain.

An experiment was conducted under pastoral conditions to test the hypothesis that a single injection of MGA or MAP could be used in non-pregnant and late-pregnant animals to prevent pregnancy during the next wet season without affecting subsequent fertility.

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MATERIALS AND METHODS

In September 1985 four hundred Shorthorn cows and heifers were drafted from a large mob on Ord River Station in the Kimberley region of Western Australia, after pregnancy-testing by rectal palpation. Only those animals apparently not pregnant or in the third trimester of pregnancy were selected, including as many young animals as were available in these categories. They were then allocated to four groups:Control - no injection,, 500mg MAP, 60mg MGA, and 90mg MGA.

Agents were administered in 1ml aqueous suspension as a subcutaneous injection in the neck region. After weighing and tagging,the animals were returned to a paddock with 4 per cent bulls. In May of the following year the animals were mustered again, weighed, pregnancy-tested and their lactational status determined. This procedure was repeated in November of that year and June of the following year when the experiment was terminated.

RESULTS

The proportion of animals pregnant in each treatment group at each mustering is given in Table 1. In May all treatments had reduced the number of animals pregnant to about half that in the control group. However, by the following November numbers of pregnant animals in these groups had increased above the control, in compensation for the earlier period of suppression. By the following June there were no major differences between the groups in the numbers of animals pregnant (27-43%). In the small (10-12) number of heifers,those with no permanent teeth at September 1985, the suppression of pregnancy by progestagen treatment was even greater (Fig 1).

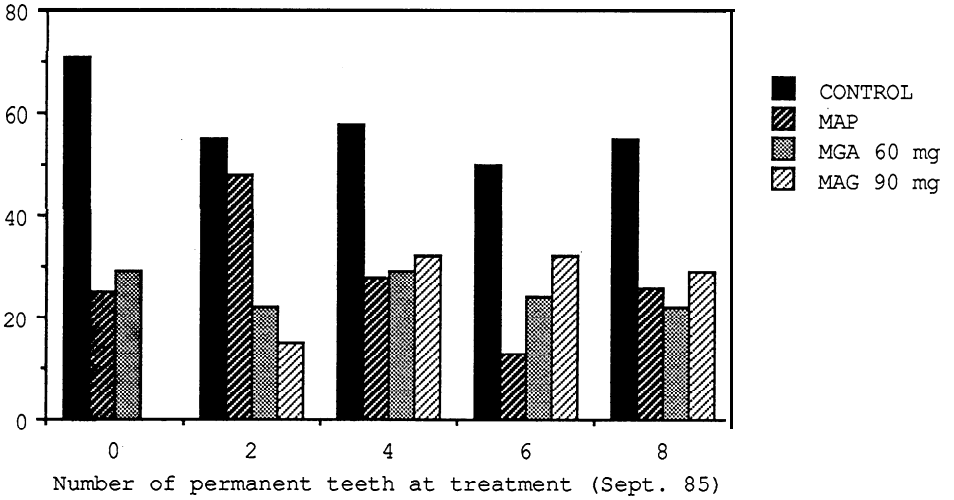
Table 1 Proportion of cows pregnant at each muster*

Treatment groups	Sept. 1985	May 1986	Nov. 1986	June 1987	Abnormal foetuses
Control	28/100	50/89	48/86	33/84	0
MAP	28/100	25/84	48/77	17/64	4
MGA 60mg	28/100	21/84	54/79	29/71	1
MGA 90mg	28/100	23/88	52/74	42/74	3

*Differences in total numbers in treatment groups resulted from animals which had died,were left in the paddock or had lost ear tags.

At the first and particularly second musterings after treatment, several animals were thought on rectal palpation to contain abnormal foetuses. At the June muster 12 animals previously detected in this group were slaughtered and inspected at the abattoir. Eight animals were found to have mummified, late-term foetuses and in some cases there was considerable putrefaction. All had been in their third trimester of pregnancy when the drugs were administered, and all were in the groups treated with progestagen, (Table 1).

Fig. 1 Effect of treatment on pregnancy



DISCUSSION

It is clear that both agents successfully inhibited oestrus and prevented pregnancy for a period of at least six months in a large number of the animals treated. This proportion was highest in the heifers (Fig.1) and non-pregnant animals. Since it is likely that a number of these animals had undetected pregnancies when the treatments were administered, the results are consistent with those obtained previously under more controlled conditions (Surjoatmodjo et al.1986).

There were no apparent differences between MAP and MGA treatments and no advantage in using 90mg of MGA over 60mg. Chenault et al. (1986) reported that 60 and 90mg of MGA delayed the first oestrus in cyclic beef heifers by 187 and 204 days and pregnancy by 205 and 253 days. They suggested that the longer interval between first observed oestrus and pregnancy for the 90mg dose might be due to a low conception rate. Under the extensive conditions of Ord River Station these differences would not be detected and are probably unimportant.

At the last muster, in all groups the number of animals pregnant was lower than in the control group at the previous musters and this was attributed to the effects of two consecutive years of poor pasture growth;in the 1986/87 wet season there was significant rainfall in only two months. However, the proportion of animals pregnant at that stage in the group given MAP was only 27 per cent, which must be of some concern although in the previous experiments with this agent (Surjoatmodjo et al. 1986) there had been no effect on subsequent fertility of treatments up to 1350mg MAP.

The effect of giving progestagens to animals in late pregnancy resulting in retention of mummified foetuses was perhaps to be expected but not, to our knowledge, previously reported in cattle. Shelton et al. (1982,1983) reported that they had observed increased incidence of dystocia and delayed parturition in does given injectable MAP in the mid-trimester of pregnancy; MGA given orally in doses sufficient to suppress oestrus had no effect on kidding in goats in one experiment,but in a second experiment with larger numbers, 10 per cent of the treated does carried kids past

term. In heifers, feeding lmg MGA daily from about day 95 of gestation to day **35** postpartum had no effect on gestation length or calving (Schul et al. 1969). Although the animals slaughtered in this experiment showed no ill effects and in fact provided wholly acceptable carcasses, it is clear that a high incidence of mummified foetuses would be an unacceptable consequence of using these agents in late-pregnant animals. The effective dose and stage of pregnancy at which parturition is prevented are not known.

Although both agents gave promising results for preventing pregnancy for six to eight months, this might be insufficient to overcome totally the problem with heifers in pastoral regions. Improved nutrition during the wet season could result in sufficient liveweight gain to induce puberty in the following dry season with the young cow giving birth in the late wet season and attempting to sustain its calf during the subsequent dry period. In order to achieve a satisfactory period of enforced anoestrus it may be necessary to administer two doses at six-month intervals. Alternatively, other methods of administration which are longer-acting could be investigated. Silastic implants have been successfully used over shorter periods of time but with a release rate suggesting an effective action up to two years (Roche and Crowley 1973). Other options are intravaginal devices, slow-release rumen capsules, or micronised preparations. While it seems unlikely that the market for these agents for pastoral cattle in Australia and elsewhere, comparedto their use for short periods under feedlot conditions in the USA, would justify the commercial development of . alternate formulations, they should nevertheless be investigated.

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