

IMPLEMENTATION AND MAINTENANCE OF SELECTION

PROGRAMS FOR BEEF CATTLE

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CURRENT SITUATION

Genetic improvement of beef cattle in Australia has traditionally revolved around the show ring with objective measurement being incorporated to a limited degree over the past few years. Recently, however, a growing number of studs and commercial herds have swung to completely objective recording of commercially important characters. As in other animal industries there has been pressure to form large scale co-operative breeding programs with only limited success. It would appear that in the foreseeable future most genetic improvement will come from reasonable sized herds - i.e. 100-300 breeding females.

THE BREEDING HERD

The breeder's objective is to achieve a high calving percentage i.e. 90-95% plus, of an average weight as close to 275kgs (600lbs) as possible at the normal weaning age of about 240-300 days. The greatest influence on uniformity is of course a compact calving period. With the explosion in labour costs in recent years it is vital to be able to carry out as many routine tasks as possible i.e. castrate and vaccinate (strain 19), or drench, brand or tag, dehorn vaccinate and weigh in one operation after one muster. This is virtually impossible with a calving period of longer than 12 weeks.

In our drought prone environment adequate nutrition will always be a problem particularly with very young or old cows. While young cows are a vital part of any breeding herd, I believe old cows can be eliminated, sharply reducing the percentage of breeders needing special attention. If heifer calves are weaned at around 275kgs., they are fairly easily maintained for mating at 15 months, they will cycle readily and carry some body reserves which stand them in good stead while lactating.

The dystocia problem discourages most breeders from joining heifers to calve at two years of age but we have found that if very big tall (wither height) bulls, with a lesser degree of muscling are used and the heifers calved on steep country or with as much exercise as possible - dystocia is simply not a problem.

Similarly if herd fertility is high i.e. 95% plus calving, and heifers calve at two years, then older cows can be turned off earlier with improved returns, a shorter generation interval and a more resilient herd in difficult times. These benefits are not well recognised by the majority of breeders.

If cow nutrition and body weight are adequate then the limiting factors to calving percentage will be the relative fertility of both bulls and cows.

FERTILITY AND THE SERVING CAPACITY TEST

This brings us to the recent development of a method of measuring the reproductive efficiency of a bull. Termed the "serving capacity test", this was developed by Dr. Mike Blockey and the Victorian Department of Agriculture. It involves counting the number of times a bull serves immobilised heifers in a yard test over 40 minutes after being sexually stimulated by watching other bulls serve. The usual range in serving capacity appears to be between 0-15 with 6 plus being considered high, 3-5 medium and 0-2 low and therefore to be culled.

This test is combined with a physical examination and measurement of scrotal circumference to give an indication of how many cows any individual bull can handle - i.e. a bull of a serving capacity of 8 with 34cm scrotal circumference can handle double the usual recommendation of 1 bull to 40 cows even at 15 months of age. Obviously, considerable economies can be effected by spreading the cost of a good bull over twice the number of cows.

Also a cow served 5 times or more during an oestrus period, has almost twice the chance of conception (80-92%) compared with those served once only (60-65%).

GENETIC IMPROVEMENT AND THE SERVING CAPACITY (SC) TEST

Unfortunately, so far the industry has seized on the S.C. test as a means to identify and cull poor servers, rather than to increase the rate of genetic gain. Virtually all studs are using a modified system ("3 serves and out"), where bulls are removed from the test after attaining three serves inside the allotted time. However, our experience over seven years in selling tested bulls has proved that commercial breeders prefer and will pay a premium for higher serving capacity bulls.

By using more active bulls, up to 85% of calves can be born in the first month of calving making weaning weight assessment much more accurate. Increased reproductive efficiency also contributes directly to the very essence of genetic improvement i.e. instead of the usual stud situation of 12-15 bull calves by one sire born over 3-6 months or longer, it is possible to get up to 50 bull calves by one sire, with up to 40 born within a month. Under these conditions selection of genetically superior sons to replace the sire can be made with much more confidence. I believe this system provides a more acceptable alternative to the time and expense of an AI program under

Australia's typically low labour extensive grazing conditions.

The physical examination of bulls associated with the S.C. test allows skilled observation of such subjective factors as feet, soundness of hips etc. and can identify bulls subject to premature breakdown. Also the S.C. test introduces a potentially valuable degree of "Survival of the fittest" which has been missing for generations.

Finally the evidence to date indicates that the daughters of high serving capacity bulls are themselves more fertile.

(One potentially disastrous influence on fertility, has been the flareup of venereal type disease in our herds over the last two years and much work needs to be done in this area).

FEMALE SELECTION

Some confusion exists regarding the percentage of potential replacements to retain, and the effect of varying age structure on genetic improvement. Selection criteria is not clear cut, but as we can now trace female production records back for at least three generations, there appears to be a reasonable correlation between dams production and the daughters subsequent lifetime production. Our practise then is to select approximately 60-70% of the heifer drop on a combination of the dams record (i.e. M.P.P.V.) and the heifers own weight gain and wither height records. These are mated for one cycle only (i.e. 21 days) and the pregnant heifers retained as herd replacements - usually approx. 60-70% of those mated.

Hence most emphasis is automatically placed on early conception which appears highly repeatable and at least compatible with high production. Heifers with unusually narrow pelvis, development, internal growths etc. can often be identified and eliminated at pregnancy diagnosis.

CULLING OF FEMALES

The initial culling of "Threshold factors" such as feet, temperament, structural defects and weak white eyes are of course usually removed in the original rejects of 20-30%. These are best fattened and slaughtered, particularly in the initial stages of a herd improvement program.

Any suggestion of heavy forequarters, jowls or heavy brisket, are culled, as, in heifers particularly - the size of the udder appears in inverse proportion to the size of the brisket or similar fatty deposits on the carcass. Some further culling is carried out on the basis of their first or second calves. All females are sold "cast for age" at 8 years by which time, losses and

culling including dry cows have accounted for approximately 25%.

A quick rule of thumb to rate genetic improvement is the difference in weaning weight comparing three year old's calves with those of mature cows, usually about 10%. While our two year olds fluctuate with the seasons our three year olds have for three years weaned the heaviest calves, no correction applied.

BULL SELECTION

Heavy supplementary feeding as practised by most studs usually has the effect of pushing the low gainers up nearer the top, making gains more uniform and consequently selection of genuine fast gainers much more difficult or impossible.

Ideally, retained bulls should gain at the rate of about .8kg to 1 kg per day (1.7 - 2.2lbs) up to 20 months of age (British breeds). Differences of about + 25% above average down to about -20% below will be easily recognised under these conditions.

I believe bull selection to be reasonably straight forward and well appreciated by most producers, so briefly:-

Use ratios to express growth rate above or below the average for the rearing group- instead of actual kg per day gain

Castrate at least 50-60% at 5 months or at weaning including any which had to be assisted at birth

Keep retained bulls on a reasonably high protein diet over summer to promote structural and testicle growth (the latter is vital to maximum fertility)

Run in mobs preferably no bigger than 30 to discourage homosexual tendencies.

Young bulls are the group undoubtedly most susceptible to worms so while strategic drenches are vital, every effort should be made to allow natural worm resistance to be expressed, usually as greater weight gain.

A number of potential sires should be drawn from the calves born in the first month of the calving season, on a minimum of 10% above average at weaning - as great a post-weaning gain as possible (free of foot defects, eye troubles, bad temperament etc), and leave the final choice until after the serving capacity test is carried out at 20 months - retaining for sires only those bulls of serving capacity 10 or better with at least 36cm. scrotal circumference.