PRODUCTION PERFORMANCE IN PUREBRED
AND GRADE BRAHMAN CATTLE AT BROOKSVILLE
1970-1980

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SUMMARY

The introduction of highly productive grade females into the breed as a means for genetic improvement of fertility and maternal performance in Brahman cattle is being evaluated in a 12-year project which will be completed in 1982. Preliminary results suggest that the judicious introduction of productive grades would be an effective procedure for improving productivity in the breed. Purebred and high grade (7/8 or more) Brahman cows sired by the same purebred bulls have had calving rates of 88 and 85% respectively, suggesting the purebred Brahman likely are afflicted with inbreeding depression. The grades also have had an advantage in weaning weights of calves (204 vs. 198 kg).

INTRODUCTION

The Brahman breed of cattle has firmly established itself as the leading breed for crossbreeding in the USA and is known throughout the world for this capability. It is somewhat antithetical, therefore, that as purebreds the cattle are not among the better performers, especially with respect to fertility and calf survival. These characteristics, while not of great concern to commercial producers since Brahman bulls do well in crossbreeding programs, are of great importance to purebred breeders because they increase the cost of producing commercial bulls and reduce the number of surplus females for sale. Fertility and calf survival apparently have not been improved much through selection and culling in purebreds or the traits would not remain a problem in the breed.

There has been little agreement in academic discussions of the most effective way, if any, for improving reproductive efficiency in such populations. The economic importance and scientific challenge of the subject led eventually to a study of the problem being established at the Brooksville Station with the first matings being made during the Spring of 1970.

OBJECTIVES

The objectives of this study were to investigate the genetic cause of the sub-optimal reproductive performance of the Brahman herd at Brooksville; that is, whether it is due to sub-optimal genetic potential, or to inbreeding depression and to determine whether the problem could be corrected by the introduction of highly productive high grade females into the herd.
PROCEDURE

The approach was to begin with a group of highly productive grade Brahman cows with a minimum of 3/4 Brahman breeding and upgrade them to Brahman bulls that came from Brahman dams that had calved for a minimum of four consecutive years prior to the time the son was selected. With a few minor exceptions this objective was achieved. The grade females were selected the fall they were three years of age, had calved on schedule as a 3-year-old, had weaned a good calf and were pregnant with a big fetus for the second calf. As indicated in table 1, the introduced grade cows (G) were mated to grade bulls to produce inter se grade cows (G²), and to Brahman bulls to produce high grades (BG). The high grades were also intermated to produce a second generation of inter se grades (BG²). Simultaneously the purebred cows from the Brooksville herd, which had been selected ineffectively for fertility for a period of 20 years, were mated to the same Brahman bulls as the introduced grade (G) cows.

TABLE 1. PRODUCTION PERFORMANCE IN PUREBRED AND GRADE BRAHMAN CATTLE AT BROOKSVILLE, 1970-1980

<table>
<thead>
<tr>
<th>Breeding of cows</th>
<th>Number</th>
<th>Pregnancy rate, %</th>
<th>Weaning weight of calves, kg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SE</td>
<td>Mean</td>
</tr>
<tr>
<td>Purebred Brahman</td>
<td>472</td>
<td>68</td>
<td>1.8</td>
</tr>
<tr>
<td>Introduced grades</td>
<td>402</td>
<td>85</td>
<td>2.9</td>
</tr>
<tr>
<td>Inter se grades</td>
<td>157</td>
<td>78</td>
<td>3.5</td>
</tr>
<tr>
<td>High grades</td>
<td>303</td>
<td>85</td>
<td>2.5</td>
</tr>
<tr>
<td>Inter se high grades</td>
<td>150</td>
<td>78</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Contemporary B and BG cows were sired by the same Brahman bulls, selected on the basis of fertility of their dams.

RESULTS AND DISCUSSION

The results through 1980 are shown in table 1. Two additional calf crops will be added before the present trial is completed. The pros and cons of continuing the project beyond that point presently are under consideration. The viewpoints of the readers of the report are solicited.

A striking feature of the results to date is that all groups of the grade cattle have had significantly higher reproductive and weaning performances than the purebreds. The two groups of grade cows that were the result of inter se mating of grades (G² and BG²) had a lower reproductive rate (78%) than the G and BG grades sired by purebred bulls (85%). The reproductive rates for all grades, however, were higher than that for the purebreds (78 to 85% vs. 68%). Inter se mating of the high grades resulted in the heaviest calves at 215 kg, followed by an average of 206 kg for the other grades and 198 kg for the purebreds.

Additional experimentation will be required before firm conclusions can be drawn. These data along with observation and breeder experience,
however, suggest the following:

1. Apparently the Brahman cattle used in this trial are suffering from inbreeding depression. This view is supported by the fact that half-sib high grade and purebred females produced at dramatically different rates (68 vs. 85% pregnancy).

2. One of the major objectives of this research was to evaluate the introduction of productive high grade animals to relieve inbreeding depression and improve productivity in purebred populations. The results to date suggest that the method is effective.

3. When this project was organized, the Brahman Breeders Association permitted the above procedure. Since that time, the procedure has been terminated. From the results of this trial, one cannot help but wonder whether closing the registry in a breed including a relatively small population of cattle may be a tragic and perhaps fatal mistake for the breed. Why should the judicious introduction of new genetic material into a breed be prohibited?