difference more closely. It was found that there was very little difference between the sexes in the mild B's (MB) and that most of the sex differences was in the IB and XB group, in which males were much more numerous than females. These results indicate that the vertebral abnormality thought to be associated with the dwarf gene shows up more severely in male calves than in female calves. There is no ready explanation for these findings.

The X-ray technique is only one of several methods that have been proposed for distinguishing clean animals from dwarf carriers. The data shown in this report and those from other stations indicate that the X-ray method alone is not accurate enough to use in merchandising breeding cattle. The progeny test is highly accurate, but due to limitations of time and expense, it is impractical to use on large numbers of animals. However, for those breeders who wish to conduct the progeny test, the X-ray method could be a good way to screen bulls before breeding them to the tester females. The X-ray method should eliminate about 80 percent of the dwarf carriers and considerably reduce the expense of a progeny testing program.

Summary

The X-ray method for the identifying carrier of the snorter dwarf gene has been tested extensively for the past five years. This method is based on vertebrae abnormalities as shown on lateral lumbar radiographs of young calves. Results from over 1500 X-rays made at the Fort Reno Station indicate that the X-ray method is approximately 77.8 percent accurate in identifying dwarf carriers, 79.2 percent accurate in identifying dwarf-free calves, and 94 percent accurate in identifying dwarf calves. Sex differences were found in the degree of abnormality of the vertebrae. More males had abnormal X-rays than females, and the abnormalities were more extreme in the males. These sex differences cannot be explained at the present time.

The X-ray method is considered to be highly accurate in identifying dwarf calves and might be of use when the identification by visible characteristics is doubtful. Although the method is not highly accurate in detecting dwarf carriers, it could be a valuable means of screening prospective bulls before progeny testing them for dwarfism.

The Influence of Excessive Fatness On the Performance of Beef Females

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Many purebred cattlemen, who often fatten heifers to a high degree while fitting for show and striving for maximum development, feel that excessive body fat adversely affects the subsequent produc-

tive value of beef females. Although most commercial cattlemen do not feed heifers and cows above a moderate plane of nutrition, limited experimental results indicate the possibility that productivity may even be slightly impaired by levels of energy intake within limits fed by some cattlemen.

Basic information on the effect of a high degree of body fatness is needed. Such information, obtained by studying extreme differences in energy intake, should aid in the interpretation of results from research in which more "practical" differences in plane of nutrition are studied.

The specific objective of this experiment is to determine the influence of excessive body fat on the performance of beef females by inducing a high degree of fatness at two different stages of the life cycle: (1) In the heifer during the period of growth and development after weaning (Phase I), and (2) in the mature cow that has completed growth and attained full body size (Phase II).

Phase I

Procedure

Thirteen sets of twin heifers are now on test in this phase of the experiment. One heifer of each set is fed a ration adequate in all nutrients but containing only enough energy to promote gains of one-half to two-thirds pounds per head daily (low level). The second heifer of each set receives a similar ration plus a full feed of corn (high level). Heifers are individually fed in stancheons to facilitate accurate control of feed intake and weight gains of each heifer.

Heifers are bred to calve between 30 and 36 months of age. After calving, a ration adequate for maximum lactation is fed to all heifers. Reproductive performance of the heifers is being measured by breeding efficiency, maintenance of pregnancy, ease of calving, and the weight and condition of calves at birth. Milk production is being estimated by the growth rate of the calves, by milking the heifers at regular intervals, and by weighing the calves immediately before and after nursing. Data is also being obtained concerning body measurements, body temperature, certain blood constituents, and gross physiological observations of the reproductive tract.

Results

Three sets of heifers attained sufficient age during the year to complete their second pregnancy. No difference in breeding efficiency was noted between the low and high level groups, contrary to observations made on these same heifers the previous year when the high level heifers required more services and a longer time for conception. The high level heifers averaged 372 pounds heavier previous to second calving and were correspondingly much fatter than the low level heifers. Birth weights averaged 60 and 70 pounds for the low and high level heifers, respectively.

The three low level cows dropped normal calves with no difficulty. Two of the three high level cows required assistance with very difficult calvings, and their calves were dead at birth.

Differences in milk production have not been consistent. In two comparisons the high level twins have produced 64% and 11% more milk than their low level mates, while in the third comparison, the low level twin has produced 892% more milk than the high level cow. Lactations are not complete.

Eight additional sets of twins reached calving age during the past year. The high level heifers averaged 513 pounds heavier than their low level mates previous to calving, and the large differences in weight were reflected in similar differences in condition.

No difference in breeding efficiency was noted between the two groups. Average weights of calves at birth were 61 and 66 pounds, respectively, for the low and high level heifers. All eight of the low level heifers dropped normal calves without difficulty, and required no assistance at calving. Of the eight high level heifers, three calved normally, three required assistance with very difficult calvings, one required a caesarean delivery (calf died), and one dropped a calf which was dead at birth. One of the high level heifers died 10 days after calving due to complications arising from mastitis, and another was removed from test 112 days after calving due to complications arising from a stricture of the rectum.

Differences in milk production have not been consistent. Lactations have advanced sufficiently to allow a preliminary comparison within five sets of twins, although none have progressed beyond 95 days at this time. Milk production is in favor of the low level heifer in two cases, the high level heifer in two instances, and there is essentially no difference in the other comparison.

Phase II

Procedure

Thirty eight-year-old cows were divided into two groups of fifteen cows per group on the basis of five years previous production records. The cows were started on test on August 8, 1957, at the Lake Carl Blackwell range area near Stillwater. Lot 1 (low level) cows were allowed to graze native range during the summer and were fed prairie hay and 2.5 pounds of cottonseed cake per head daily in a trap during the wintering period. Lot 2 (high level) cows received the same treatment and in addition were allowed free access to milo from late summer until calving. These cows consumed as much as 25 pounds milo per head daily. As each cow calved, she was removed from the high-grain ration, placed with Lot 1 cows, and fed 2.5 pounds cottonseed cake per head daily and prairie hay.

The cows produced their second calf crop on this experiment during 1959. After the 1959 calf crop was weaned, the cows were slaughtered, and a gross examination of each cow was performed.

Results

Calves were dropped in January, February and March. The high level cows were 323 pounds heavier and much fatter previous to calving than the low level cows (Table 1). The large difference in weight and condition largely disappeared during the suckling period, and the high level cows had a weight advantage of only 42 pounds at weaning time.

Table 1.—Production Data on Mature Cows (Phase II) 1959.

	Lot 1 Low Level	Lot 2 High Level
No. of cows		
At start of test, 8-8-57	15	15
At conclusion of test, 10-16-59	12	11
Av. weight of cows, lb.		
At start of test, 8-8-57	1051	1080
Before calving, 1-16-59	1122	1445
At conclusion of test, 10-16-59	1077	1119
Av. birth weight of calves, lb.[1]	76	81
No. of calves weaned	11	9
Av. 112-day weight of calves[2]	266	283
Av. 210-day weight of calves[2]	480	497

[1] Adjusted for sex
[2] Adjusted for age and sex

No differences in breeding efficiency or calving difficulty between the two groups were noted.

Calves from the high level cows averaged five pounds heavier at birth, and 17 pounds heavier at both 112 and 210 days than calves from the low level cows. These results, which agree with those obtained the previous year, suggest that the mature cow is not easily injured by excessive fatness. The relatively small advantage in milk production shown by the high level cows, as indicated by the weight of the calves, also suggests that the beef cow makes very inefficient use of body fat reserves during the lactation period.

Summary

Results reported herein are of a preliminary nature, and include only one year's work with a limited number of animals. Definite conclusions are not justified at this time.

A high degree of body fatness induced during the growth period of twin heifers had no influence on breeding efficiency, and resulted in heavier calves at birth, more calving difficulty, and a higher death loss of both calves and cows. The effect on milk produtcion was not clear.

Excessive body fatness induced in mature cows resulted in slightly heavier calves at birth and at weaning, and had no apparent influence on breeding efficiency, difficulty at calving, and death losses.