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# Splay-foot in cattle

## **Abstract**

Angular limb deformity, observed in several breeds of cattle, results in a knock-kneed and splay-footed condition in the front legs. This study shows that angular limb deformity is a congenital structural defect, inherited as a simple, autosomal, recessive trait.

## **Keywords**

Cattlemen's Day, 1989; Kansas Agricultural Experiment Station contribution; no. 89-567-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 567; <https://krex.k-state.edu/dspace/handle/2097/6456>

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## SPLAY-FOOT IN CATTLE

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### Summary

Angular limb deformity, observed in several breeds of cattle, results in a knock-kneed and splay-footed condition in the front legs. This study shows that angular limb deformity is a congenital structural defect, inherited as a simple, autosomal, recessive trait.

### Introduction

Structural conformation has been an important consideration in cattle evaluation and selection for several hundred years. Leg structure is a major part of conformation and can influence function. One undesirable trait of the front legs is splay-foot, an angular limb deformity that has been observed in several breeds of cattle, both beef and dairy. It occurs in various degrees, but has always been discriminated against. The purpose of this study was to determine the cause and inheritance of this type of angular limb deformity in cattle.

### Experimental Procedures

Based on reports of front leg deformities from veterinarians, breed associations, and herd owners, herds were visited, and information was gathered. Affected Jersey cattle were obtained for a breeding trial and detailed studies, including pedigree analysis, radiographic evaluation, mineral and hormone evaluation, and measurements of histopathological characteristics. All affected animals (Figure 5.1) were compared to normal animals of the same sex, age, and breed.

### Results and Discussion

Pedigree analysis of 41 cattle affected with angular front limb deformity showed a significantly higher relationship to seven bulls and four cows of the Jersey breed than 100 randomly selected pedigrees of Jerseys of the same time period. One bull sired nine of the affected animals and was grandsire of an additional 10. Four cows with the angular limb deformity were mated to an affected bull to produce seven affected calves and no normal calves. From field data, no matings of affected to affected animals have produced normal calves. These are the results expected when a trait is inherited as a simple, autosomal recessive.

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Detailed evaluation indicated that the major deformity involved the distal radial epiphysis. Affected animals showed various degrees of knock-kneed and splay-foot conditions. The condition improved as they got older. Two calves that were unable to stand at birth improved greatly with proper care and leg splints, to the point that they could have entered a milking herd by the time they were two years old. Very severely affected calves did not improve.

No differences were found between the affected and normal calves in serum calcium, phosphorus, zinc, copper, magnesium, manganese, or the hormone, thyroxine. Histopathological lesions were found only in the distal radius, which showed signs of osteochondrosis (improperly developed bone).

This trait can be controlled with a breeding program that does not allow the mating of cattle with angular limb deformity. Since calves can improve with age, notes of the condition must be made at birth, and those animals must not be used for breeding. The responsibility for controlling this, as all other genetic defects, lies with the seedstock producer. Commercial cattlemen should take note if affected calves occur and change sources of bulls.



Figure 5.1. Calves Mildly (left) and Severely (right) Affected with Angular Limb Deformity.