

## The Effect of Geographic location Upon Performance

When cattle are moved westward, northward and upward in altitude they respond favorably. Conversely, if they are shipped eastward, southward or to lower elevations there is a negative response.

This phenomenon holds true for most mammals. For example, the Whitetail deer grows more slowly and is much smaller at maturity in Florida than in states to the west or north. The largest of all Whitetails are found in the Northwest and into



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western Canada. The same holds true for all the cloven hoofed animals and the carnivores as well.

Cattle producers have attempted to explain this response by pointing out the nutrient deficiencies in Southeastern forages, but this theory has proven incorrect.

Researchers harvested a large quantity of alfalfa hay from the same cutting and field in the Midwest. Half the hay was sent to Idaho and half to Georgia. Then a group of young animals born in the Midwest and of similar genetic background was divided, with half sent to Georgia and half to Idaho. At each location the animals received the identical hay as their total diet. The result – faster growth and larger size in Idaho.

USDA workers carried out a similar study with a Hereford breeding herd. Cattle were moved from Brooksville, Fla., to the Miles City station in Montana, and those which had been maintained in Montana were relocated to Florida. In Montana, the cattle originating in Florida increased in every performance measure including birth weight, while the Montana cattle went “down hill” in Florida.

Cattle feeders in the plains of Texas, New Mexico, Oklahoma and Kansas have been aware of this situation for years. Feeder cattle in the Southeast cost less because of lack of “bloom” and condition and they offer the further advantage of compensatory gain. Finally at processing they bring essentially the same price as the so-called “high quality” cattle available from other areas.

It’s baffling that this geographic effect is common knowledge among commercial cattle producers and zoologists but unknown or ignored by seedstock producers. For example, in the late 1960s and early ‘70s when purebred breeders started an ill-advised search for more frame and mature size they discovered some “big” bulls in western Canada.

Breeders here in the United States were surprised when the progeny of the Canadian bulls were the same size and performance as the cattle previously produced. Examination of the pedigrees of the Canadian imports revealed their ancestors came from the United States only two or three generations back. Conclusion – same genetics but developed in a different geographic location.

**Such mistakes can** be minimized in the future by using a breed association’s expected progeny differences (EPDs), which are calculated from a databank composed of records from herds

with different geographic locations but tied together by using “check sires.” This largely removes the environmental effects from the performance information.

Remember, regardless of whether the cattle are purebred or commercial, breeding stock or feeders, it’s advantageous to move cattle westward and northward, not the reverse.

Another situation involving location is termed “environmental interaction.” An example would be the post-weaning gain test records of two weanling bulls representing different breeds. Assume that an Angus bull calf and an American Brahman are tested together in Kansas where they record identical rates of gain. Had they been tested in Montana the Angus calf would have gained more rapidly, but had the calves been tested in the coastal plain of Alabama, Georgia and Florida the Brahman would have been the top performer.

**The important point** is that animal performance is the result of the total impact of genetics and environment. Therefore, the following statements are true:

1. Cattle should be selected under the same conditions as those under which their offspring will perform.
2. In order to measure genetic differences performance must be measured under an identical environmental situation.