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Corn Can Be Too Hard

C. C. Culbertson
Iowa State College

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AFTER hybrid corn became popular many farmers decided that some varieties were too hard to feed successfully to beef cattle. At the Iowa Station we boiled the problem down to hard corn vs. soft corn—instead of hybrid vs. open-pollinated—and found in our first year’s test that soft corn is superior for cattle feeding.

Five varieties of corn were selected on the basis of apparent hardness. One was Reid Yellow Dent and four were hybrid. By measuring the resistance of these kernels to pressure we ranked them in order of hardness. Partly because we had selected a type of Reid Yellow Dent that was rough and relatively high in floury starch, that variety was rated softest. In the hybrid group, Iowa 939 and Iowa 13 were medium soft, while Pioneer 307 and U.S. 44 were hardest. All varieties may vary in hardness from year to year, so there is no permanent significance to the order in which these varieties were grouped.

We picked five groups of yearling Colorado steers for the tests, and during the 210-day feeding period all were fed the same kinds and amounts of feed other than corn. They were fed corn silage the first 190 days, with linseed meal, alfalfa hay, mineral mixture and block salt. The silage was fed 15 pounds per steer per day for the first 160 days; 10 pounds the next 20 days; 5 pounds the next 10 days. During the rest of the feeding period the steers were fed a pound and a half of alfalfa hay a day instead of the silage.

We found that the group of steers fed the softest corn made an average daily gain of 2.17 pounds per steer—about 10 percent more than the steers getting the hardest corn. In the lots fed the hardest varieties, one group gained 1.97 pounds a head daily and the other gained 1.8 pounds. The groups fed the two medium soft varieties gained 2.09 and 2.02 pounds a head daily.

The feed cost of producing 100 pounds of gain on the lot fed the softest variety was $8.34, figuring corn at 50 cents a bushel. In the two lots fed the hardest varieties the costs were $9.45 and $9.84. The selling price of the steers fed the softest corn when we sold them in Chicago was $10.55. Those fed the hardest corn sold at $10.15—40 cents a hundred less than those fed the softest corn. Steers which were fed the medium soft corn were estimated at $10.25. Dressing percentages were about the same for all groups.

Hogs Saved Hard Corn

There was not a significant difference in results with the softest varieties and those which were medium soft. The difference was found between the two extremes—the very soft and very hard varieties. Two groups of hogs followed each group of steers during the feeding
period. For the first 50 days two pigs followed each group. When the experiment started they weighed about 190 pounds on the average. When they were taken out, four fall pigs averaging about 80 pounds were placed in each lot. The hogs were fed a supplemental mixture of tankage, meat meal and alfalfa meal, and as much shelled corn as they would eat and still pick up grain from the droppings of the steers.

A “check lot” of hogs was kept in dry lot and not allowed to follow the steers. This group enabled us to determine the amount of feed equivalent picked up which could be credited to the steers because of the hogs following.

Hogs running with the steers fed the softest corn saved 31 pounds of feed for each 100 pounds of gain made by the cattle. But in the lots where the cattle were fed hard corn and made the lowest gain, hogs saved 92 pounds of feed for each 100 pounds of gain.

So if we credit to the cattle the feed picked up by the hogs, there isn’t much difference in the degree to which hard and soft corn is used in the feedlot.

Hard corn is typically slick-surfaced, with flinty type starch. It is thought that the results of our tests may encourage corn breeders to develop more strains with softer, floury starch for feeding purposes.

When Joe L. Robinson, who is in charge of the State Corn Yield Test, was testing our corn samples for hardness he ran across something which “stumped the experts.” Instead of finding that corn gets harder with age, Robinson’s tests showed it grew softer! A machine had been developed for the purpose of testing the corn. The kernel of corn was placed on edge between the jaws of the apparatus and pressure was applied by a screw device until the kernel broke. For instance, the crushing resistance of one variety was 48.47 pounds on Nov. 29, but had dropped to 40.70 by April 12.

More Tests Coming

Nevertheless, both experience and recorded tests show that when corn gets to be a year or two old, the cattle don’t take to it so readily as when it is new. Perhaps loss of moisture and flavor cuts down the palatability.

The University of Illinois ran some experiments using new and old corn to determine how the two compared for feeding. On full feed, one lot of steers in the trials ate 18 pounds of new shelled corn a day, while another lot ate but 17 pounds of old corn. Steers being fed the new corn spent only 14.8 minutes in eating 8 pounds of shelled corn, but those getting old corn munched away at the same amount for 25.5 minutes. Of 6 steers getting new corn, none left any feed. But 5 out of 6 getting old corn left a portion of it—about 26 percent on the average.

The final word has not been said about the relative value of hard and soft corn for cattle feeding. Whether the soft corn will produce faster gains consistently, we do not know; whether the value of the hard and soft corn will remain about the same if hogs follow the cattle and the gains of the hogs are credited to the cattle, we do not know. All we do know for certain is that in this first test it worked out that way. In coming years we are going to follow up these tests with others to prove that we were right or that the results we got in the first year’s tests “just happened.”

Possibly next year we shall try to find out whether grinding hard corn before feeding it to cattle will increase its value, or just what effect, if any, grinding will have.

A good many cattle feeders believe that it would be advantageous to crack or grind shelled corn, especially when it happens to be one of the hard hybrid strains. The grinding may be good procedure for the hard types, although grinding a relatively hard hybrid corn at the Nebraska Station the past year did not prove economical.

We need to know more about the effects of preparation on these harder types of corn. We have in mind for next year a feeding trial here at the Iowa Station in which a soft and a hard strain of corn will be fed side by side, probably in three different forms—shelled, ground shelled, and ground ear corn.