

Feeding livestock wood pulp cuts costs, saves grain

UNIVERSITY PARK — Studies a few years ago at Penn State showed that wood pulp fines, by-products of making tissue paper, could partially replace forage and grains in feeding livestock.

Now economists at University Park have determined that savings in feed costs can be as high as 35 per cent by using these wood pulp fines.

The latest studies were reported during meetings of the American Agricultural Economics Association at the University of Illinois. Donald J. Epp, Penn State economist, described costs and savings in feeding wood pulp fines to calves weighing up to 450 pounds, to stocker steers from 450 to 630 pounds, and to feeder steers of 630 to 1050 pounds.

Epp said the 35 per cent savings are possible with wood pulp fines fed to stocker steers when the hauling distance from pulp mills is no greater than 20 miles.

The potential feed cost savings for feeder steers can be 28 per cent when the distance from paper mills is no greater than 225 miles. And cow-calf operations can save 31 per cent over standard feed costs when the hauling distance is not greater than 100 miles.

Wood pulp fines are readily available in Northeastern Pennsylvania and other areas of the nation where tissue paper is produced, it was noted. Such fines are a waste product from sulfite-based paper mills. Due to the sulfite treatment, the fines are predigested for livestock and make a high energy feed source.

Earlier experiments by Lowell L. Wilson and animal science associates at Penn State revealed that wood fines in steer rations could save as much as 2.1 pounds of grain for each pound of carcass weight gain.

Epp said the net profit of a cow-calf operation can increase by \$16.06 per animal where fines partially replace corn. As for feeder steers, fines can increase net profits by \$40.14 per head. For

a total livestock program, feeding fines can increase net profits by \$79.24 per animal, it was pointed out.

"Savings are reduced as the distance needed to haul the fines increases and as the price charged for fines goes up," Epp stated. "Savings increase as the price rises for corn and other conventional feeds," he added.

He said the paper mill in the study has sold fines to farmers for 2.00 per ton. The study adjusted costs of fines from \$4 per ton potentially paid to farmers for removing waste fines, to \$4 per ton charged for fines. Costs of hauling were figured at 5, 10, and 15 cents per ton-mile.

"Even the highest price and transportation costs, there is an area of considerable size around a paper mill where farmers would find it economical to feed fine-based rations to cattle," Epp commented.

Penn State feeding experiments revealed that steers can be fed up to 40 per cent of the dry matter as fines with satisfactory gains and no adverse effects on carcass traits. Lambs can be fed up to 66 per cent of the ration dry matter as fines with no detrimental effects on weight gains or carcass traits.

Fines have a high moisture content averaging 75 to 77 per cent moisture. They have a granular appearance similar to soybean meal. Fines store well uncovered outdoors, provided they are not mixed with other feed ingredients or nitrogen. Fines, and rations containing over 40 per cent fines, will freeze during winter unless protected or stored inside.

Consisting primarily of delignified cellulose, fines are well digested by cud-chewing animals. Despite a high fiber value, they have little or no value as roughage.

Thus, some standard roughage such as hay, 10 to 12 per cent, should be included in rations containing fines, especially where lambs are fed.

Grain intentions up for Pa. growers

UNIVERSITY PARK — Pennsylvania grain producers indicate they will plant approximately 1,830,000 acres of corn in 1981, up two percent from last year.

However, U.S. corn producers indicated in March planting intentions reports they will plant the same acreage as a year ago. Last year's figure was 84 million acres.

States which are reducing their corn acreage are those hit hardest by the 1980 drought. One state, Missouri, expects corn acreage to be only 83 percent as large as last year's harvest.

Drought reduced the 1980 corn harvest by 18 percent according to H. Louis Moore, Penn State Extension agricultural economist.

In an effort to overcome the loss of income as a result of the drought, producers increased wheat acreage sharply last fall. The wheat harvested in late June and July will provide income sooner than corn, which would not be harvested until October-December.

Other producers may decide to

produce more soybeans in 1981, feeling soybeans are less susceptible to drought because of their short growing season. Early intentions reports indicate that soybean acreage will probably decline about one percent from a year ago.

Substantial acreage increases for soybeans are expected in Georgia and Nebraska. Pennsylvania producers indicate they will plant ten percent more soybeans in 1981.

Demand from domestic users and overseas markets have raised prices almost 30 percent higher than last year's level.

Despite the tight supply situation, corn prices have not been as strong as expected. The carryover of corn on October 1, 1981 is only expected to be about 620 million bushels, compared to 1.6 billion bushels on year ago.

At the current rate of use, this carryover amounts to only a four week supply. If corn prices strengthen in the next month, producers could easily become

Livestock market and auction news

Indiana Auction

Thursday, April 30

Report supplied by PDA

CATTLE: 176. Compared with last week's market: Sl. steers: few Choice 61.25-65.00; couple Good 57.75-60.75; few Standard 53.00-56.50; Sl. heifers: few Choice 61.00-64.50; few Good 57.70-58.25; few Standard 50.00-52.75. Sl. cows: Utility & Commercial 44.50-48.75; Cutters 42.00-46.00; Canner & L. Cutter 38.75-43.00; Shells down to 30.00. Sl. bulls: few Yield Grade No. 1-2 1200-1575 lbs. 49.00-55.25.

FEEDER CATTLE: Steers, few Medium & Large Frame No. 2, 300-650 lbs. 50.00-62.00; Heifers, few Medium & Large Frame No. 1 & 2 300-650 lbs. 49.00-53.00; Bulls Medium & Large Frame No. 2, 400-700 lbs. 45.00-59.00.

CALVES: 84. Few Choice 96-105 lbs. 78.00-94.00; 80-110 lbs. 65.00-70.00.

FARM CALVES: Hol. Bulls 85-120 lbs. 71.00-85.00; Hol. Heifers 80-110 lbs. 85.00-92.50. Beef Cross Bulls & Heifers 75-115 lbs. 74.00-107.50.

HOGS: 102. Barrows and gilts .50-1.00 higher. US 1-2 200-235 lbs. 41.50-43.00; No. 1-3 200-250 lbs. 40.00-41.50; few No. 2-3 250-300 lbs. 36.00-39.00; few No. 1-3 140-180 lbs. 36.00-39.00; Sows US No. 1-3 300-500 lbs. 34.50-38.75; few No. 2-3 250-275 lbs. 31.00-33.00. Boars 29.00-29.75.

FEEDER PIGS 19.

Weekly Summary

Friday, May 1

Report supplied by PDA

CATTLE: 7541. Compared with 6709 head last week, and 7583 head a year ago. Slaughter steers 1.00-1.50 higher; Sl. heifers steady-1.00 higher; Sl. cows uneven, mostly .50-1.00 lower; Sl. bullocks steady to weak; Sl. bulls uneven. Sl. steers: High Choice & Prime No. 3-4, 65.75-68.00; Choice No. 2-4, 63.50-68.50; Good 56.50-63.50; Standard 53.00-56.50. Sl. heifers: Choice 58.50-63.75; Good 55.00-61.00; few

Standard 50.00-56.00. Sl. cows: Utility & Commercial 44.50-48.00, few 49.00; Cutters 41.50-47.00; Canner & L. Cutter 38.50-43.50; Shells down to 30.00. Sl. bullocks: few Choice 56.00-61.00; Good 54.00-60.00; few Standard 51.00-56.00. Sl. bulls: Yield Grade No. 1, 1000-2400 lbs. 54.00-58.50, few 61.00; Yield Grade No. 2, 1000-1400 lbs. 51.00-55.50.

FEEDER CATTLE: Steers, Medium Frame No. 1, 300-600 lbs. 56.00-74.00. Heifers, Medium Frame No. 1, 300-625 lbs. 51.00-59.00; Bulls, Medium Frame No. 1, 300-650 lbs. 52.00-60.00; Large Frame No. 2, 400-900 lbs. 45.00-53.00.

CALVES: 2705. Compared with 3137 head last week and 2883 head a year ago. Vealers grading Good & Choice steady to 5.00 lower, Standard & Good grades steady to 10.00 higher. Few Prime 111.00-120.00; Choice 95.00-105.00, few 115.00; Good 75.00-90.00; 90-120 lbs. 65.00-78.00; 70-90 lbs. 55.00-71.00; Utility 50-110 lbs. 50.00-65.00.

FARM CALVES: Hol. Bulls 80-125 lbs. 70.00-105.00, few 115.00; Hol. Heifers 80-140 lbs. 90.00-197.00, few 100.00-170.00; Beef Cross Bulls & Heifers 70-100 lbs. 74.00-107.00.

HOGS: 7803. Compared with 6655 head last week and 8990 head a year ago. Barrows and gilts steady to 1.00 lower. US No. 1-2 200-240 lbs. 40.50-42.50, few to 43.00; No. 1-3 200-250 lbs. 39.00-41.50; No. 2-3 200-275 lbs. 37.00-40.60; No. 1-3 140-190 lbs. 36.50-39.50; Sows steady to 1.00 higher. US No. 1-3 300-575 lbs. 33.00-38.00; No. 2-3 300-650 lbs. 32.00-36.00. Boars 24.00-32.50.

FEEDER PIGS 1108. Compared with 827 head last week and 1947 a year ago. Feeder pigs 1.00-2.00 higher. US No. 1-3 20-35 lbs. 17.50-27.00 per head; No. 1-3 35-50 lbs. 25.00-34.00; No. 1-3 50-75 lbs. 32.00-41.50.

GRADED FEEDER PIGS: 2279. Compared with 2629 head last week, and 2075 head a year ago. All sales by CWT. 1.00-5.00 lower, spots to 12.00 lower on 2-3. US No. 1-

2 25-40 lbs. 80.00-95.00, 40-50 lbs. 64.00-88.50, 50-60 lbs. 60.00-86.00, 60-80 lbs. 52.00-71.50; US No. 2-3 25-40 lbs. 67.50-86.00, 40-55 lbs. 64.00-75.00.

SHEEP: 372. Compared with 1419 head last week and 597 head a year ago. Spring sl. lambs uneven. Choice 65-100 lbs. 66.00-81.00; Good & Choice 25-70 lbs. 59.00-69.00. Good & Choice Woolled Lambs (few) 90-100 lbs. 44.00-51.00. Sl. ewes: 11.00-27.00.

Chambersburg Auction

Thursday, April 30

Report supplied by PDA

CATTLE: 407. Compared with last week's market: Slaughter steers about steady; Sl. cows .75-1.25 lower. Sl. steers: Choice No. 2-4, 975-1250 lbs. 60.75-64.75, Good 56.75-60.00; Standard 51.75-56.25. Sl. heifers: Choice 57.00-61.00; few Good 51.00-54.75. Sl. cows: Utility & Commercial 43.25-48.25; Cutters 43.00-47.00; Canner & L. Cutter 40.25-43.75; Shells down to 37.00. Sl. bullocks: few Good 53.85-55.50; few Standard 51.50-52.75. Sl. bulls: Yield Grade No. 1, 1100-1875 lbs. 52.00-59.00.

FEEDER CATTLE: Steers & Large Frame No. 1 & 2 350-700 lbs. 55.00-62.00. Heifers, Medium Frame No. 1, 275-500 lbs. 53.00-61.50.

CALVES: 309. Vealers grading Choice about steady, with Standard & low Good 2.00-4.00 higher. Choice 87.00-100.00; Good 75.00-85.00, 70-95 lbs. 64.00-74.00; Utility 50-85 lbs. 45.00-65.00.

FARM CALVES: 10.00-15.00 lower. Hol. Bulls 85-125 lbs. 75.00-92.00, few 110.00; Hol. Heifers 90-140 lbs. 125.00-170.00.

HOGS: 117. Barrows and gilts about steady. US No. 1-2 210-225 lbs. 40.50-41.00; US no. 1-3 300-500 lbs. 33.50-36.00. Few Boars 30.00-32.25.

FEEDER PIGS 39. Few US No. 1-3 20-25 lbs. 13.00-19.00 per head; one lot No. 1-3 50 lbs. at 34.00.

SHEEP: 13. Spring sl. lambs one lot choice 100 lbs. at 52.50.

Engineering bacteria may cut nitrogen needs

BELTSVILLE, Md., — Genetically engineered bacteria may be one solution to the increasing demand for food production, L. David Kuykendall, told science writers at a seminar here recently.

Kuykendall, a microbiologist with USDA's Science and Education Administration was referring to the Rhizobium bacteria which change nitrogen into a form that can be used by plants.

In this process, called "nitrogen fixation," Rhizobium form a symbiotic relationship with legumes such as soybeans, lima beans, clover and alfalfa. The Rhizobium live in nodules on the roots of these plants and "fix" inert nitrogen from the air.

Kuykendall told his audience that he is developing techniques for selectively breeding Rhizobium bacteria that will have the traits needed to fix large quantities of

nitrogen. Next to water, nitrogen is the nutrient most needed by plants. Farmers annually apply millions of dollars worth of nitrogen fertilizer to their crops.

Kuykendall is also in the process of developing strains of Rhizobium japonicum (the strain of bacteria associated with soybeans) that he expects will be preferred by soybeans grown in fields containing indigenous strains of this bacteria. Indigenous Rhizobium occur in most soils and are readily available to legumes.

However, these indigenous bacteria vary widely in their ability to fix nitrogen and thus may influence, to a greater or lesser extent, the production of crops. Large increases in soybean production could result from the development of highly efficient nitrogen-fixing strains that are accepted by soybeans over these already present in the soil.

In order to test the acceptance of the new bacteria by the soybeans, Kuykendall developed a genetically marked strain of Rhizobium. These bacteria have chromosomes genetically "marked" by their ability to resist antibiotics.

The Rhizobium are placed in the field as the soybeans are seeded. The soybeans are dug prior to maturity, the nodules are removed from the roots, crushed and placed in a growing medium containing antibiotics.

It the bacteria grow and multiply, Kuykendall says, this is

evidence that the soybeans have accepted the new Rhizobium. If, on the other hand the bacteria die, it is an indication that the soybeans have been nodulated by the less-productive indigenous bacteria susceptible to antibiotics. Kuykendall and his colleague Deane Weber are conducting these field trials.

Kuykendall, with associates in SEA's Cell Culture and Nitrogen Fixation Laboratory, has been able to advance the study of Rhizobium genetics through gene transfer. He has introduced gene-carrying plasmids from unrelated bacteria into Rhizobium japonicum, the Rhizobium that nodulates soybeans. These new genes were successfully transferred between Rhizobium during reproduction.

Kuykendall said the introduction of new genes provides a basis for selective hybridization of the bacteria. New gene combinations are the first step in developing desirable traits for fixing nitrogen.

Kuykendall explained to his audience that although the development of genetically superior Rhizobium requires a lengthy process of identifying and mapping their genes, the final result could mean marked increases in crop production through the use of superior Rhizobium.

Rhizobium that selectively fix large quantities of nitrogen on superior plants would diminish our dependence on expensive nitrogen fertilizers, he said.

Although there are hundreds of islands in the Caribbean, only about 50 are inhabited.

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