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## Corn silage, wheat head silage and milage for finishing cattle

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## Corn Silage, Wheat Head Silage and Milage for Finishing Cattle<sup>1,2,3</sup>

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### Summary

Six finishing rations were compared: (1) 10% corn silage, (2) 20% corn silage, (3) 10% wheat head silage, (4) 20% wheat head silage, (5) unprocessed (whole) milage and (6) processed (rolled) milage. Each ration was fed to 18 yearling steers for 123 days. Rate of gain was not affected by ration. Feed consumption and feed required per lb. of gain were higher for steers receiving whole milage than for steers receiving any of the other five rations. Although steers fed rolled milage consumed less feed, they were 11.4 percent more efficient than steers fed whole milage.

### Introduction

Beef cattle on most finishing rations require some roughage for maximum performance. Roughage decreases the incidence of founder, liver abscesses and digestive upsets. Corn silage is an effective roughage for feedlot rations; but, little is known about wheat head silage or milage.

Milo harvested as head-chop silage could supply all or a part of both the grain and roughage in feedlot rations. Head-chopping milo (25 to 32% grain moisture) would also permit earlier, more efficient harvesting.

The purposes of this trial were to evaluate source and level of roughage and to compare unprocessed (whole) with processed (rolled) milage in beef finishing rations.

### Experimental Procedures

Ninety Angus, Hereford and crossbred yearling steers averaging 724 pounds were allotted by breed and weight to 18 pens of five steers each. Three pens were randomly assigned to each of the following rations: (1) 10% corn silage, (2) 20% corn silage, (3) 10% wheat head silage, (4) 20% wheat head silage, (5) unprocessed (whole) milage and (6) processed (rolled) milage. Eight Angus steers weighing 784 pounds were allotted to individual pens; four steers were randomly assigned to rations 5 and 6. Compositions of the final rations and supplements are shown in table 10.1.

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<sup>1</sup>In this report, the term "milage" refers to milo head-chop silage.

<sup>2</sup>Equipment for harvesting milage was provided by Field Queen Corporation (a division of Hesston Corporation), Maize, Kansas.

<sup>3</sup>Roller mill for processing milage was provided by Dodson Manufacturing Co., Wichita, Kansas.

The corn silage and wheat head silage (Parker) are the same as those described on page 33 of this publication. The milage was harvested from one source in mid-September, 1972. The forage harvester was equipped with a two-inch recutter screen. Grain moisture was 28 to 32 percent and milage moisture was 36 to 42 percent. Water was added to the milage to increase its moisture content approximately eight percentage units. Milage was ensiled in 10 ft. X 50 ft. concrete stave silos; dry matter, protein and fiber content are shown in table 10.1. Milage dry matter contained 71 percent grain and 29 percent forage.

Each steer was implanted with 36 mg. of stilbestrol at the beginning of the 123-day finishing trial (February 15 to June 18, 1973). All rations were mixed and fed twice daily.

Steers fed corn silage or wheat head silage (rations 1-4) received 35 percent silage rations at the start of the trial. Silage was reduced to 20 percent after five days, and to 10 percent in another five days in rations 1 and 3. Steers fed milage (rations 5 and 6) received the same ration throughout the trial. Milage for ration 6 was processed through a roller mill to crack all of the milo; an estimated 20 to 30 percent of the grain was cracked in the unprocessed milage in ration 5.

Initial and final weights of the steers were taken after 15 hours without feed or water. Final live weights were adjusted to a 62.5 percent dress and feedlot performance was calculated on that basis.

Three individually-fed steers receiving rations 5 and 6 were placed in metabolism stalls for ten days mid-way through the trial. After a four-day adjustment period, total feces were collected for six days.

### Results

Feedlot performance for the group-fed steers is presented in table 10.2. Performance by pens of cattle fed the same rations varied quite widely. Steers fed 10 and 20 percent corn silage or wheat head silage rations had similar rates and efficiencies of gains. Steers fed milage (rations 5 and 6) tended to gain less than steers fed any of the other four rations, although the difference was not significant. Cattle receiving whole milage (ration 5) consumed more dry matter ( $P < .05$ ) and required more feed per lb. of gain ( $P < .05$ ) than cattle receiving rolled milage (ration 6), corn silage (rations 1 and 2) or wheat head silage (rations 3 and 4). Assuming that corn silage and wheat head silage dry matter contained about 45 and 35 percent grain, respectively, steers fed rolled milage required less grain dry matter per lb. of gain ( $P < .05$ ) than steers fed any of the other five rations. Dressing percentage, quality grade and yield grade were not influenced by rations fed.

Response of the individually-fed steers was similar to that of group-fed steers for rations 5 and 6 (table 10.3). Cattle fed whole milage consumed more feed ( $P < .05$ ) than cattle fed rolled milage. Also, apparent ration dry matter digestibility tended to be lower for whole milage than for rolled milage.

Table 10.1. Ration and Supplement Compositions and Milage Analyses  
(%, Dry Matter Basis)

| Item                          | Silage |       |            |       |        |        |
|-------------------------------|--------|-------|------------|-------|--------|--------|
|                               | Corn   |       | Wheat head |       | Milage |        |
|                               | 10%    | 20%   | 10%        | 20%   | Whole  | Rolled |
| <u>Ration ingredients</u>     |        |       |            |       |        |        |
| Corn, cracked                 | 41.25  | 36.25 | 41.25      | 36.25 | ---    | ---    |
| Milo, steam flaked            | 41.25  | 36.25 | 41.25      | 36.25 | ---    | ---    |
| Corn silage                   | 10.0   | 20.0  | ---        | ---   | ---    | ---    |
| Wheat silage                  | ---    | ---   | 10.0       | 20.0  | ---    | ---    |
| Milage                        | ---    | ---   | ---        | ---   | 92.5   | 92.5   |
| Supplement                    | 7.5    | 7.5   | 7.5        | 7.5   | 7.5    | 7.5    |
| <u>Supplement ingredients</u> |        |       |            |       |        |        |
| Soybean meal                  | 27.6   | 35.4  | 10.4       | 0.6   |        | 7.8    |
| Milo, rolled                  | 47.2   | 42.3  | 62.6       | 74.4  |        | 71.0   |
| KCl                           | 2.7    | 0.8   | 3.8        | 1.9   |        | ---    |
| Dicalcium PO <sub>4</sub>     | 0.5    | 0.7   | 0.5        | 1.4   |        | ---    |
| Limestone                     | 9.7    | 8.5   | 10.4       | 9.4   |        | 7.0    |
| Salt                          | 3.4    | 3.4   | 3.4        | 3.4   |        | 3.4    |
| Fat                           | 1.0    | 1.0   | 1.0        | 1.0   |        | 1.0    |
| Trace minerals                | 0.8    | 0.8   | 0.8        | 0.8   |        | 0.8    |
| Aureomycin <sup>a</sup>       | 0.5    | 0.5   | 0.5        | 0.5   |        | 0.5    |
| Vitamin A <sup>b</sup>        | 0.1    | 0.1   | 0.1        | 0.1   |        | 0.1    |
| Urea                          | 6.5    | 6.5   | 6.5        | 6.5   |        | 8.4    |
| <u>Milage analyses</u>        |        |       |            |       |        |        |
| Dry matter                    |        |       |            |       |        | 49.80  |
| Crude protein                 |        |       |            |       |        | 9.00   |
| Crude fiber                   |        |       |            |       |        | 12.7   |

<sup>a</sup>Formulated to supply 70 mg per steer per day.

<sup>b</sup>Formulated to supply 30,000 I.U. per steer per day.

Table 10.2. Feedlot Performance of Group-Fed Steers

| Item                              | Silage             |                    |                    |                    |                    |                    |
|-----------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
|                                   | Corn               |                    | Wheat head         |                    | Milage             |                    |
|                                   | 10%                | 20%                | 10%                | 20%                | Whole              | Rolled             |
| No. of steers                     | 15                 | 15                 | 15                 | 15                 | 15                 | 15                 |
| Initial wt., lbs.                 | 725                | 721                | 728                | 722                | 723                | 725                |
| Final wt., lbs.                   | 1032               | 1051               | 1040               | 1025               | 1020               | 1010               |
| Avg. daily gain, lbs.             | 2.49               | 2.68               | 2.54               | 2.47               | 2.41               | 2.32               |
| Avg. daily feed, lb. <sup>c</sup> |                    |                    |                    |                    |                    |                    |
| milo, fl.                         | 6.80               | 6.50               | 7.11               | 6.45               | ---                | ---                |
| corn, cr.                         | 7.01               | 6.70               | 7.33               | 6.65               | ---                | ---                |
| milage                            | ---                | ---                | ---                | ---                | 19.75              | 16.87              |
| corn sil.                         | 2.22               | 3.96               | ---                | ---                | ---                | ---                |
| wheat sil.                        | ---                | ---                | 2.40               | 4.03               | ---                | ---                |
| supplement                        | 1.35               | 1.46               | 1.37               | 1.43               | 1.61               | 1.38               |
| Total                             | 17.38 <sup>a</sup> | 18.62 <sup>a</sup> | 18.21 <sup>a</sup> | 18.56 <sup>a</sup> | 21.36 <sup>b</sup> | 18.25 <sup>a</sup> |
| Feed/lb. gain, lb.                | 7.02 <sup>a</sup>  | 6.96 <sup>a</sup>  | 7.32 <sup>a</sup>  | 7.53 <sup>a</sup>  | 8.89 <sup>b</sup>  | 7.87 <sup>a</sup>  |
| Dressing %                        | 62.9               | 62.4               | 62.3               | 62.3               | 62.1               | 63.1               |
| Quality graded <sup>d</sup>       | 10.5               | 10.5               | 10.4               | 10.5               | 10.5               | 9.9                |
| Yield grade                       | 3.12               | 3.17               | 3.03               | 2.87               | 2.88               | 2.60               |
| Condemned livers                  | 0                  | 2                  | 1                  | 1                  | 0                  | 2                  |

<sup>a,b</sup> Means in the same row with different superscripts differ significantly ( $P < .05$ ).

<sup>c</sup> 100% dry matter basis.

<sup>d</sup> Quality grade assigned, 10 = low choice, 11 = average choice.

Table 10.3. Feedlot Performance and Ration Digestibility of Individually-fed Steers fed Whole or Rolled Milage

|                                                 | Milage       |              |
|-------------------------------------------------|--------------|--------------|
|                                                 | Whole        | Rolled       |
| No. of steers                                   | 4            | 4            |
| Initial wt., lb.                                | 750          | 707          |
| Final wt., lb.                                  | 1003         | 957          |
| Avg. daily gain, lb.                            | 2.06         | 2.03         |
| Avg. daily feed, lb. <sup>a,b</sup>             |              |              |
| milage                                          | 16.98 (34.7) | 14.69 (30.0) |
| supplement                                      | 1.39         | 1.23         |
| Total                                           | 17.37        | 15.92        |
| Feed/lb. gain, lb.                              | 9.08         | 7.85         |
| Dressing %                                      | 61.6         | 62.4         |
| Quality grade <sup>c</sup>                      | 10.5         | 10.25        |
| Yield grade                                     | 3.01         | 3.04         |
| Condemned livers                                | 0            | 0            |
| Ration dry matter digestibility, % <sup>d</sup> | 70.8         | 73.5         |

<sup>a</sup>100% dry matter basis.

<sup>b</sup>Values in parentheses are milage intake on an as-fed moisture basis.

<sup>c</sup>Quality grade assigned, 10 = low choice, 11 = average choice.

<sup>d</sup>Each value is the mean for three steers.