

Effect of Microbial Inoculation on the feeding value and dry matter recovery of high moisture ear corn. D.W. Rice*, S.D. Soderlund and B.R. Harman, Pioneer Hi-Bred International, Inc., Microbial Genetics Division, Johnston, Iowa.

An experiment was conducted to determine the effect of microbial inoculation on the feeding value and dry matter recovery of high moisture ear corn (HMEC). The corn was harvested in September of 1991 at 61% dry matter. One load of processed ear corn was utilized to fill one 2-MT capacity silo for each treatment. Twenty-four 2-MT capacity silos were utilized in the study. Twelve silos were inoculated with Pioneer® brand 1189 high moisture corn inoculant to supply 1.0×10^4 lactic acid bacteria per g of HMEC (INOC) while the other twelve silos served as the control (CONT). Forty yearling Angus x Hereford cross steers (initial weight of 365 kg) were utilized in a subsequent 84 day growth trial. The steers were individually ad libitum fed in a semi-confinement facility equipped with Calan head gates. The test diets contained 82% HMEC, 12% cracked dried shell corn and 6% of a 42% protein supplement on a DM basis. Microbial inoculation significantly ($P < .05$) improved the feeding value and dry matter recovery of HMEC.

ITEM	CONT	INOC
HMEC dry matter, %	59.31	59.65
DM intake, kg	8.51 ^a	9.10 ^b
Average daily gain, kg	1.28 ^a	1.51 ^b
Feed efficiency, DM basis	6.80 ^a	6.10 ^b
Gain/MT of HMEC fed, kg ^c	108.20 ^a	119.95 ^b
Dry matter recovery, %	92.83 ^a	94.94 ^b

^{a, b} Differ significantly ($P < .05$).

^c As-is basis.

Key words: HMEC, Inoculation, Dry matter recovery

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186 Influence of barley and *Aspergillus oryzae* fermentation extract supplementation on microbial efficiency, duodenal crude protein and amino acid flows, and digesta kinetics in steers fed prairie hay. R.M. Westvig*, J.S. Caton, and D.O. Erickson, North Dakota State University, Fargo.

Four steers (295 kg) fitted with ruminal and duodenal cannulas were arranged in a 4x4 Latin square to evaluate the effects of barley and *Aspergillus oryzae* (AO) fermentation extract on microbial efficiency, duodenal protein flow and digesta kinetics. Treatments were arranged in a 2x2 factorial with barley (2.73 kg/steer daily) and AO (2 g/steer daily) supplementation. Steers were housed individually and fed basal forage (8.1% CP) ad libitum. Main effect means indicated that barley supplementation increased ($P < .004$) microbial protein synthesis (MPS) from 453.0 g/d to 609.2 g/d, but did not affect microbial efficiency ($P > .10$). Amaferm supplementation had no effect ($P > .10$) on either MPS or microbial efficiency. Non-microbial duodenal CP flow was not affected by either barley or AO supplementation. Barley supplementation increased ($P < .10$) total duodenal AA flow from 671.6 g/d to 781.9 g/d whereas AO had no effect ($P > .10$) on total flow of AA. Amaferm increased ($P < .09$) percent arginine flow while barley decreased the proportion of arginine reaching the duodenum ($P < .10$). Both barley and AO decreased serine and alanine proportions reaching the duodenum. Barley also decreased ($P < .10$) the percent threonine and aspartic acid at the duodenum, and increased ($P < .10$) glutamic acid ($P < .09$). Ruminal fluid digesta kinetics were not affected ($P > .10$) by either barley or AO supplementation. Rate of ruminal particulate passage was decreased by barley ($P < .06$) but was not affected by AO supplementation ($P > .10$). While barley also increased ruminal fill, AO decreased ruminal fill ($P < .06$). These results indicate that barley supplementation increased ($P < .004$) MPS, duodenal AA flow ($P < .09$) and ruminal fill, but decreased rate of particulate passage ($P < .06$). Amaferm supplementation, on the other hand, had no effect on MPS, total AA production, or fluid digesta kinetics ($P > .10$). Furthermore, AO decreased ruminal fill and had no effect on rate of particulate passage.

Key Words: Barley, *Aspergillus oryzae*, Amino acid flow

187 Effect of slaughter date on performance and carcass quality of feedlot steers. M. T. Van Koeving*, D. R. Gill, F. N. Owens, H.G. Dolezal and C. A. Strasia. Oklahoma State University, Stillwater.

Crossbred yearling steers ($n = 256$; 330 kg) were allotted to 32 pens in a randomized block design to evaluate the effect of slaughter date on live performance and carcass characteristics. Steers were divided into four slaughter groups and fed a high concentrate diet for either 105, 119, 133 or 147 d. Daily gains tended ($P < .07$) to increase in a quadratic manner with days fed, while feed intake increased ($P < .03$) linearly. Efficiency of feed conversion was the best for steers fed 119 d, and responded in a cubic fashion with days fed. With longer feeding times, carcass weight, s.c. fat thickness, KPH, overall carcass maturity, and yield grade all increased linearly ($P < .01$). Marbling score and the percentage of cattle grading U.S. Choice increased (linear, $P < .01$) with time on feed, but at a decreasing rate (quadratic, $P < .05$). Dressing percent tended ($P < .10$) to be correlated with carcass weight, while overall maturity and marbling score were correlated ($P < .05$) with s.c. fat thickness. Most performance and carcass traits tend to increase with time.

	Days on feed				SEM	Obs. Sig. ($P <$)		
	105	119	133	147		L	Q	C
No. Animals	61	63	64	64				
ADG, kg	1.36 ^a	1.44 ^b	1.41 ^{ab}	1.41 ^{ab}	.01	.22	.07	.10
F:G	7.30 ^b	6.97 ^a	7.38 ^b	7.31 ^b	.08	.26	.15	.01
Carcass wt, kg	308 ^a	325 ^b	335 ^c	347 ^d	3.34	.01	.06	.24
S.C. Fat, cm	8.6 ^a	9.9 ^{ab}	1.09 ^{bc}	1.17 ^c	.02	.01	.60	.89
REA, cm ²	82.6	83.9	85.9	84.8	.19	.14	.36	.51
KPH, %	1.48 ^a	1.61 ^a	2.03 ^b	1.98 ^b	.05	.01	.10	.01
Yield grade	2.12 ^a	2.36 ^{ab}	2.53 ^{bc}	2.75 ^c	.09	.01	.89	.75
Overall Maturity ^e	138 ^a	145 ^b	148 ^b	149 ^b	1.47	.01	.08	.61
Marbling score ^f	377 ^a	433 ^b	452 ^b	446 ^b	11.48	.01	.02	.82
Choice, %	33.9 ^a	58.9 ^b	68.8 ^b	68.8 ^b	5.52	.01	.05	.83

abcd Means within a row with different superscripts differ ($P < .05$).

^e Calculated by averaging lean and skeletal maturity; 100 to 199 = "A".

^f 300 to 399, slight; 400 to 499, small.

Key Words: Steers, Performance, Carcass Quality.

188 Grain tempering agent (SarTemp®) for corn fed to finishing cattle. I.G. Rush*, B.A. Weichenthal, and B.G. Van Pelt, University of Nebraska, Scottsbluff.

SarTemp® is a grain tempering agent that includes both a wetting agent and a yucca extract, sarsaponin. A finishing trial was conducted with 84 yearling steers to evaluate the addition of SarTemp® and water or a wetting agent alone and water to dry corn in a feed mixer before processing through a roller mill. Dry corn at 15% moisture was treated with SarTemp® at 7.5 ml/45.4 kg of corn or a wetting agent and enough water to bring the corn up to 18% moisture in both treatments. Enough corn was treated to last for approximately one week. The trial was conducted during the early fall and through a mild winter. The steers were implanted with Synovex-S initially and fed Ruminen and Tylan in the diet. Final weights were adjusted to a common dressing percent (62.5). Receiving and two step-up diets were used to reach the final diet dry matter composition of 85% corn, 10% corn silage and 5% protein supplement during the 138 day trial. Diets were calculated to have 12% crude protein, .55% calcium and .3% phosphorus (dry matter basis). Using four pens per treatment, steers fed the corn treated with SarTemp® and water had higher gains ($P < .10$) than those fed untreated rolled corn (1.72 vs 1.55 kg/day). Steers fed corn treated with the wetting agent and water were intermediate in gain (1.65 kg/day). Feed efficiencies for steers fed corn treated with SarTemp® or the wetting agent were similar (5.87 vs 5.91), but improved ($P = .10$) over that for untreated rolled corn (6.47). Feed dry matter intake means were not significantly different, nor were treatment means for dressing percent, carcass fat cover and marbling score. These data suggest that performance of finishing cattle can be improved if the recommended level of SarTemp® (sarsaponin plus wetting agent) and water are added to dry corn before rolling and feeding.

Key Words: Grain tempering, sarsaponin, wetting agent, corn