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Effect of multispecies fungal culture extract supplementation (BIOPREMIX) on the growth performance and carcass characteristics of feedlot cattle

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To evaluate the effect of supplementing feedlot cattle with a multispecies fungal culture extract (BIOPREMIX) (MFE; *Aspergillus flavus*, *Aspergillus niger*, *Aspergillus oryzae*, *Aspergillus terreus*, *Phlebia radiata*, *Pyricularia oryzae*, *Stropharia coronilla*, *Thanatephorus cucumeris*, *Trichoderma longibrachiatum*, *Trichoderma reesei*, *Trichoderma viride*) in growth performance and carcass characteristics, Angus × SimAngus-crossbred steers (n = 14) and heifers (n = 46; body weight (BW) 344 ± 21 kg) were used in randomized complete block design. Cattle were blocked by BW and housed in 4 feedlot pens (randomly assigned 2 pens per treatment) where a hay-based diet was fed for 84 d (backgrounding), followed by a ground corn-based finishing diet. Subsequently, cattle were harvested upon reaching desired 12th rib fat thickness (2.0 cm). Diets were offered ad libitum and with (MFE) or without (CON) the inclusion of the multispecies fungal culture extract supplement. Steers were weighed at 28-d intervals throughout the experimental period and carcass data were provided by a USDA grader. All data were analyzed using the PROC MIXED procedure of SAS. During the 84-d period of the backgrounding phase, feeding MFE increased ($P = 0.05$) the average daily gain (ADG) by ~10%, and tended to increase ($P = 0.06$) the dry matter intake (DMI). No differences were observed in the gain to feed ratio (G:F) between treatments ($P = 0.67$). At the conclusion of the 84-d period, cattle fed MFE were heavier ($P = 0.04$) than cattle in the CON treatment. In the finishing phase, no treatment differences were observed ($P \geq 0.36$) for the ADG, DMI, and G:F. At the end of the experiment, cattle supplemented with MFE were heavier ($P = 0.04$) than cattle in the CON treatment. The quantity of days on feed in the finishing diet required to reach harvesting target was not different ($P = 0.60$) among treatments. For the carcass characteristics, dietary inclusion of the MFE tended to increase the hot carcass weight ($P = 0.10$) and increased the marbling score ($P = 0.01$). No treatment effect was detected ($P \geq 0.25$) for the dressing, *Longissimus* muscle area, 12th rib fat thickness, kidney-pelvic-heart fat content, and yield grade. Results from this study suggest that dietary inclusion of a multispecies fungal culture extract might improve the growth performance of beef cattle fed forage-based diets, as well as their carcass characteristics after conclusion of the feedlot finishing phase.

Key words: feedlot cattle, fungal extract, growth performance

Table 1. Effect of multispecies fungal culture extract supplementation on the growth performance of feedlot steers and heifers.

Item	Treatment ¹		SEM ²	P-value
	CON	MFE		
n	30	30		
BW ³ , kg				
IBW ⁴	346	344	21	0.71
84 d	428	437	4	0.04
FBW	633	655	12	0.04
ADG ⁵ , kg/d				
0 to 84 d	1.01	1.11	0.03	0.05
84 d to harvest	1.35	1.36	0.04	0.95
DMI ⁶ , kg/d				
0 to 84 d	10.03	10.76	0.26	0.06
84 d to harvest	10.78	11.07	0.22	0.36
G:F ⁷				
0 to 84 d	0.102	0.104	0.004	0.67
84 d to harvest	0.126	0.123	0.003	0.36
DOF ⁸	147	154	4	0.60

Significance was declared at $P \leq 0.05$; and tendencies were declared at $P > 0.05$ and $P \leq 0.10$.

¹ CON = no inclusion of multispecies fungal culture extract in the diet; MFE = inclusion of multispecies fungal culture extract in the diet.

² Pooled standard error of treatments means.

³ Body weight.

⁴ BW of steers registered on d 0 of the trial.

⁵ Average daily gain.

⁶ Dry matter intake.

⁷ Gain to feed ratio.

⁸ Days on feed in the finishing diet to reach harvesting target.

Table 2. Effect of multispecies fungal culture extract supplementation on the carcass characteristics of feedlot steers and heifers.

Item	Treatment ¹		SEM ²	P-value
	CON	MFE		
n	30	30		
Dressing, %	0.61	0.61	0.01	0.97
HCW ³ , Kg	385	398	8	0.10
LM area, cm	93.5	94.7	1.8	0.62
12 th rib fat, cm	2.16	2.05	0.10	0.43
MS ⁴	593	680	24	0.01
KPH ⁵ , %	2.7	2.6	0.1	0.25
YG ⁶	3.8	3.7	0.1	0.60

Significance was declared at $P \leq 0.05$; and tendencies were declared at $P > 0.05$ and $P \leq 0.10$.

¹ CON = no inclusion of multispecies fungal culture extract in the diet; MFE = inclusion of multispecies fungal culture extract in the diet.

² Pooled standard error of treatments means.

³ Hot carcass weight.

⁴ Marbling score; scale: 400–490 = slight, 500–590 = small, 600–690 = modest, 700–790 = moderate, 800–890 = slightly abundant .

⁵ Kidney-pelvic-heart fat.

⁶ Yield grade.