Effect of yeast culture on 28-day performance of newly weaned, low-stress beef calves[1]

C.R. Belknap[2], R.R. Scott[3], J.C. Forcherio[3]

Diamond V Mills, Cedar Rapids, IA, USA[2]
Longview Animal Nutrition Center, Gray Summit, MO[3]

ABSTRACT: The objective of this study was to determine the effect of yeast culture (Diamond V XPC™ Yeast Culture, Diamond V Mills) on 28-d post-weaning performance when fed to ranch-weaned calves that had previously received creep feed for 111 d. Seventy-four Angus × Charolais calves were removed from their dams, weighed, vaccinated, and held in a dry lot overnight with access to hay and water. The next morning, calves were reweighed and assigned to one of five weight blocks. Within weight blocks, calves were equally distributed to one of two treatment pens based on sex and age of dam. Treatments consisted of: control (**C**) or 0.25% Diamond V XPC Yeast Culture™ (**XPC**). The basal diet consisted of a coarse textured complete feed (88% DM) containing cracked corn, cottonseed hulls and supplemental pellet. Both treatments contained chlortetracycline and sulfamethazine (Aureo S-700®, Alpharma Animal Health, UK) at 77 g/ton and 0.0084%, respectively. Yeast culture was provided in the supplemental pellet for the XPC treatment. Calves were fed twice daily and brought up on feed during the initial 5 d, then allowed to consume feed ad libitum. Dry matter intake was recorded daily. Initial and final weights (28 d) were averaged from two consecutive weighings. After the 5-d step-up period, calves fed XPC had numerically higher DMI the remaining days on trial and DMI tended to be increased ($P < 0.19$) compared to C. Final BW and ADG were increased ($P < 0.01$) by the addition of XPC to the weaning diet. These data indicate that Diamond V XPC Yeast Culture may increase ADG of low-stress, ranch-weaned calves when fed in conjunction with chlortetracycline and sulfamethazine.

Key Words: Yeast culture, Beef calves, Performance

2007

INTRODUCTION

Diamond V Yeast Culture™ (**DVYC**) is an all-natural feed ingredient manufactured exclusively for animal nutrition. Research has shown that DVYC increases the population of rumen bacteria by up to 59% (Harrison et al, 1988; Weidmeier et al, 1987). This increase in microbial population in turn helps increase feedstuff digestibility (Yoon and Garrett, 1998). Research conducted in high-stress receiving beef cattle has shown that DVYC increases DMI during the starting period (Phillips and VonTungeln, 1985). Additional research by Zinn et al (1999) indicates that feeding DVYC significantly ($P < 0.05$) reduced pull rate in shipping-stressed receiving cattle. While the benefits of DVYC have been well demonstrated in receiving beef cattle under a high degree of stress, little research has been conducted on the effects of DVYC in starter cattle that are under a relatively low degree of stress. Therefore, the objective of this study was to determine the effect of DVYC on 28-d post-weaning performance when fed to ranch-weaned calves that had previously received creep feed for 111 d.

MATERIALS AND METHODS

Seventy-four Angus x Charolais calves (initial BW = 270 kg) were removed from their dams, weighed, vaccinated and held in a dry lot overnight with access to hay and water. The next morning, calves were reweighed and assigned to one of five weight blocks. Within weight blocks, calves were equally distributed to one of two treatment pens based on sex and age of dam. No implants were used during either the creep or weaning phases. Treatments consisted of: control (**C**) or 0.25% Diamond V XPC Yeast Culture (**XPC;** Diamond V Mills, Cedar Rapids, IA, USA), with five pens per treatment. The inclusion rate of XPC was formulated to deliver the recommended daily dosage of 14 g/h/d to cattle consuming 5.6 kg DM/d. The basal

[1]This study is a summary of a study presented as a poster presentation at ADSA/ASAS meetings (Belknap et al. 2007) that was created by Dr. K. Dorton and approved by the authors.

diet consisted of a coarse textured complete feed (88% DM) containing cracked corn, cottonseed hulls and supplemental pellet. Both treatments contained chlortetracycline and sulfamethazine (Aureo S-700®, Alpharma Animal Health, UK) at 77 g/ton and 0.0084%, respectively. Yeast culture was provided in the supplemental pellet for the XPC treatment. Calves were fed twice daily (except for d 1), and stepped up onto feed over the initial 5 d. On d 1, calves were offered 1.5% of BW of starter feed (as fed basis) and 2.3 kg of brome hay. Hay offered was then decreased to 1.4 kg on d 2 and 0.5 kg on d 3. No hay was offered on d 4 or anytime thereafter. Calves were brought up to appetite by increasing the amount of feed offered no more than a 0.5% BW per day, until calves achieved a DMI of 3% BW. Once DMI attained 3% of BW, feed was increased by increments of 0.25% BW until calves were consuming ad libitum. Feed refusals were removed, weighed and destroyed each morning. Actual DMI (DM offered minus DM refusal) was recorded daily by pen. Individual animal initial and final weights (28 d) were averaged from two consecutive weights (a.m. and p.m.). Data were analyzed using the GLM procedure of SAS (SAS Inst. Inc., Cary, NC) using a randomized complete block design. Calf weight was used as the blocking factor. Intake and growth parameters were analyzed using pen as the experimental unit.

RESULTS

After the 5-d step-up period, calves fed XPC had numerically higher DMI each of the remaining days on trial (Figure 1). Moreover, DMI tended to be increased ($P < 0.19$) compared to C (Table 1). Final BW and ADG were increased ($P < 0.01$) by the addition of XPC to the weaning diet. Moreover, ADG response by each of the five groups of calves appeared to be very consistent (Figure 2). With a tendency for higher DMI and a significant increase in ADG by the XPC cattle, F/G was not significantly different. However, there was a numerical advantage in F/G for the cattle fed XPC.

CONCLUSIONS

While Zinn et al (1999) demonstrated the effectiveness of DVYC in reducing morbidity in shipping stressed calves, the current study suggests that receiving cattle do not need to be under a high degree of stress in order to benefit from DVYC. According to the current trial, low stress receiving cattle, such as those that are ranch-weaned and creep fed, may still show increased ADG by including DVYC in the diet. Moreover, this study also suggests that DVYC seems to increase ADG in cattle when chlortetracycline and sulfamethazine are also present in the diet.

LITERATURE CITED

Belknap, C.R., R.R. Scott, and J.C. Forcherio. 2007. Effect of yeast culture on 28-day performance of newly weaned, low-stress beef calves. J. Dairy Sci. 90 (Suppl. 1): 551.

Harrison, G.A., R.W. Hemken, K.A. Dawson and R.J. Harmon. 1988. Influence of additional yeast culture supplement to diets of lactating cows on ruminal fermentation and microbial populations. J. Dairy Sci. 71:2967-2975.

Phillips, W.A. and D.L. VonTungeln. 1985. The effect of yeast culture on the poststress performance of feeder calves. Nutr. Rep. Intl. 32:287-294.

Weidmeier, R.D., M.J. Arambel and J.D. Walters. 1987. Effect of yeast culture and *Aspergillus oryzae* fermentation extract on ruminal characteristics and nutrient digestibility. J. Dairy Sci. 70:2063-2068.

Yoon, I. and J.E. Garrett. 1998. Yeast culture and processing effects on 24-hour in situ ruminal degradation of corn silage. Proc. World Anim. Prod. Conf., Seoul, Korea. 1:322-323.

Zinn, R.A., E.G. Alvarez, S. Rodríguez and J. Salina. 1999. Influence of yeast culture on health, performance and digestive Function of feedlot steers. Western Sec. Am. Soc. Anim. Sci. 50:335-38.

Table 1. Effect of Diamond V XPC Yeast Culture on 28-d post-weaning performance.

	Control	XPC	P <
Initial BW, kg	270.0	270.0	NS
Final BW, kg	319.0	323.0	0.01
DMI, kg/d	6.70	7.07	0.19
ADG, kg/d	1.67	1.81	0.01
F/G, kg/kg	4.00	3.91	NS

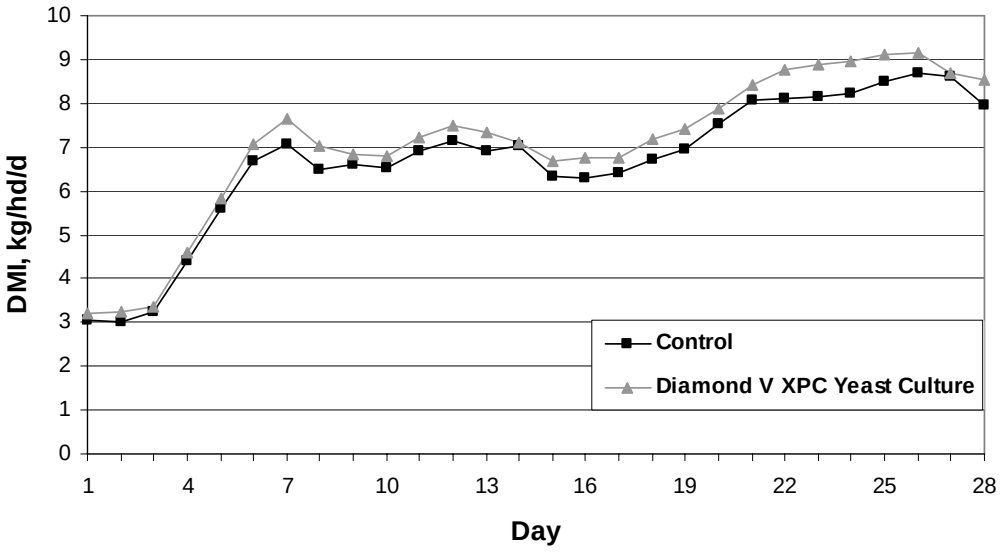

Figure 1. Effect of Diamond V XPC Yeast Culture on daily DMI of low stress starter beef calves.

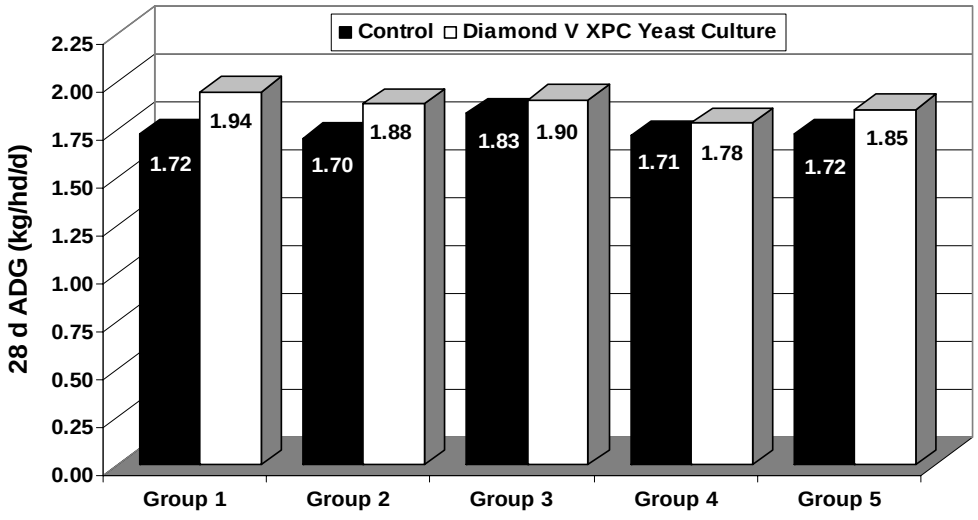

Figure 2. Effect of Diamond Yeast Culture on ADG of low stress starter beef calves by group.