



TECH FACTS

PHILEO LESAFFRE ANIMAL CARE RESEARCH BRIEF

■ A Combination of Yeast Products Supplemented to Feedlot Heifers Reduced Some of the Negative Effects Associated With Heat Stress¹

Heat stress in feedlot cattle can be detrimental to performance, health and profitability; however, utilization of feed additives has the potential to mitigate some of these negative effects. Therefore, this study was designed to determine if supplementation of a combination of proprietary yeast products (4g/hd/day; manufactured by Phileo Lesaffre Animal Care, Milwaukee, WI) in feed could mitigate the negative impacts associated with heat stress. Crossbred, phenotypically similar beef heifers (n=32; BW=849±94.8 lb) were divided into 2 pens in which one pen was fed a standard finishing ration (CON), and the other was fed the same ration plus supplemented via top dress with the 4g/hd/day proprietary yeast products. After 50 d of supplementation, cattle were transported to an environmentally controlled facility and placed in individual stanchions where indwelling jugular catheters and vaginal temperature loggers were inserted. Heifers were kept in thermoneutral conditions for 48 h (THI~67) then were subjected to heat stress for 4 d (THI~80). From d 2 to 6, hourly blood samples were collected for serum isolation from 1400-1800 h and again from 2200-0200 h which represented the targeted peak and valley of THIs over the 5 d period. A whole blood sample was collected twice daily at 1400 and 2200 h for complete blood cell counts (CBC). Data collected included body weight, water intake, respiration rate (RR; measured at 1600 and 2400 h daily) and serum cortisol, glucose and NEFAs. There was no change in body weight (P=0.14) or ADG (P=0.53) between the treatments during the heat stress. Yeast supplemented heifers exhibited decreased vaginal temperature during heat stress (P<0.01). There was no difference in water intake during the thermoneutral phase (P=0.25); however, YEAST heifers consumed more water/h (P<0.01) and visited the waterer more frequently (P<0.01) during heat stress. Respiration rates were similar (P=0.21) during thermoneutral, but YEAST heifers tended (P=0.09) to have decreased RR during heat stress. There were no major differences between treatments when evaluating hematology. There was a tendency (P=0.08) for increased cortisol in the CON heifers. There was no treatment effect on glucose (P=0.38) or NEFAs (P=0.70).



Summary

The YEAST treatment cattle showed the following positive results:

- ↓ Reduced body temperature
- ↑ Increased water intake (~1.5 gallons/hd/day)
- ↓ Tended to have decreased respiration rate
- ↓ Tended to have less serum cortisol (indicator of less stress)

Reference ¹P.R. Broadway¹, J.A. Carroll¹, N.C. Burdick Sanchez¹, and J.R. Corley²

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■ Performance of Newly Received Sale-Barn Calves Supplemented With or Without a Combination of Yeast Products¹

Commingled sale-barn calves are often at high-risk of experiencing respiratory disease after transport and during the first month of the growing phase on pasture or in pens. A recent 56-day study (to be published) was conducted on 120 steers and 120 heifers; (n=240; BW=403 ± 29 lbs.) purchased via an order buyer in Waynesboro, TN and shipped approximately 400 miles to the Mississippi Agricultural and Forestry Experiment Station, White Sand Branch Beef Unit in Poplarville, MS. Upon arrival the cattle were vaccinated against IBR-PI3, BRSV, BVD, clostridial agents, and treated with an anthelmintic. Mass metaphylaxis was not practiced in this study. The cattle were individually identified and weighed and 15 ml of blood was obtained via jugular venipuncture (day 0 and 56) for future analysis of serum urea nitrogen, non-esterified fatty acids and IGG (this analysis has not been completed yet). The cattle were stratified by sex and within each group were randomly assigned to a commercial receiving supplement (targeting 1% of BW consumption) containing either no additives (CON) or 10g/head/day of proprietary yeast products (YP; Phileo Lesaffre Animal Care, Milwaukee, WI) and placed on one of sixteen 3 acre pastures (15 head per pasture, 8 pastures per treatment) containing a mix of Bahia grass, Bermuda grass, and crabgrass. Prior to the study, pastures were clipped to a uniform height, and a biomass value was determined



for each pasture using an infrared forage biomass reader calibrated with individual hand clipped samples. All cattle had access to free-choice mineral while on pasture. All cattle were supplemented daily at 0700 and the amount fed was recorded and adjusted based on the previous day's consumption. Cattle were monitored daily for symptoms of bovine respiratory disease (BRD) based upon clinical illness scores (CIS; 1=normal, 2= mild illness, 3=moderate illness, 4=severely ill, or 5=moribund, near death). Cattle with a CIS of 2 or greater with a rectal temperature (RT) of 104 °F were considered morbid and treated with tulathromycin (1.1 mL/100 lbs. BW). After a 7 d post treatment interval (PTI) if the animal was still displaying symptoms of BRD and had an elevated RT it was treated with 2.0 mL of tilmicosin phosphate/100 lbs. of BW and was considered a treatment failure. If the animal continued to display symptoms of BRD and continued to have an elevated RT, it was treated with 4.5 mL/100 lbs. of BW of oxytetracycline. After the third treatment if the animal continued to express morbidity, it was removed from the study as a "chronic". All data were analyzed using PROC GLIMMIX of SAS.

Discussion and Results

The authors speculate that if the proprietary treatment could have been fed for a few weeks prior to commingling at the sale barn, as is recommended by the manufacturer, more dramatic performance differences could have been detected between the CON and YP. However, this was not possible. Nonetheless, some positive differences and trends were noted in performance, as summarized below:

- YP calves had an 11% higher ADG than CON (1.30 vs. 1.17 lbs.; P=.10)
- YP calves had heavier final weights at the end of the study relative to CON (476 vs. 468; P=.09)
- The percentage of calves treated at least once did not differ between treatments (P=.61, 82-84%), however there was a tendency for a 44% reduction in second treatments in the YP calves vs. CON (9.90% vs. 17.82%, P=.13)
- 2nd treatment medicine costs per pen for YP calves were reduced by 53% vs. CON (\$18.15 vs. \$38.92; P=.05)
- Total medicine cost/head was numerically lower for YP calves (\$19.89 vs. \$21.17; P=.18)
- Based on the numerical data in this study, a calculated Return on investment (ROI) for the YP calves was \$7.12 per head

Reference ¹D. Rivera¹, M.D. Cravey², Unpublished research.

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PHILEO LESAFFRE ANIMAL CARE RESEARCH BRIEF

■ A Combination of Yeast Products Supplemented to Feedlot Heifers Reduced the Immune and Metabolic Response to a Combined Viral-Bacterial Respiratory Challenge¹

Two treatments were evaluated in finishing heifers to determine the effects of a yeast supplement on immune and metabolic response to a combined viral-bacterial respiratory disease challenge (Word et al., 2016¹). Thirty-two beef heifers (717 ± 10.80 lb.) were selected and randomly assigned to one of two treatments: Control (CON), receiving no yeast supplement in the ration, or yeast (YEAST), Control ration plus a combination of proprietary products (5g/hd/day + 3g carrier = 8g/hd/day) manufactured by Phileo Lesaffre Animal Care, Milwaukee, WI. Cattle were maintained on treatments for 31 days prior to the challenge. On day -3 all cattle were challenged intra-nasally with 1x10⁸ pfu BHV-1 and allowed to rest in outdoor pens for 3 days. On study d 0, all cattle were challenged intra-tracheally with an average dose of 3x10⁷ cfu Mannheimia haemolytica, were fitted with an indwelling jugular catheter and indwelling vaginal temperature recording device, and were moved into individual stanchions in an enclosed barn. Whole blood samples were collected at the time of BHV-1 challenge at 1-h (serum) or 2-h (complete blood cell counts) intervals from 0 to 8 h, and at 12, 24, 36, 48, 60, and 72 h relative to M. haemolytica challenge. Data were analyzed using the mixed procedure of SAS specific for repeated measures with fixed effects of treatment, time, and their interaction. Water intake per hour tended

(P = 0.06) to be greater in the YEAST group compared to CON. Nasal lesion scores tended (P = 0.07) to be decreased in the YEAST group compared to CON (2.50 ± 0.26 vs. 3.19 ± 0.26). There was no difference in cortisol concentrations or vaginal temperature between treatment groups (P ≥ 0.37). There was no treatment difference (P = 0.21) in total white blood cell counts following BHV-1 challenge. Serum haptoglobin (an acute phase protein secreted during inflammation) concentration tended (P = 0.13) to be reduced in the YEAST group compared to CON, and there was a tendency (P = 0.07) for cattle in the CON



group to have greater neutrophils than CON. Neutrophil phagocytosis was not different between treatment groups (P = 0.76); however, neutrophil oxidative burst intensity tended (P = 0.13) to be greater in the treated group. Serum urea nitrogen was higher for CON (P = 0.03), possibly indicating greater lean tissue catabolism.

Summary

The YEAST treatment cattle showed the following positive results:

- ↓ Reduced nasal lesion scores
- ↓ Reduced inflammatory response
- ↑ Increased water intake per hour
- ↑ Less severe immune response required (reduced neutrophil and haptoglobin production)
- ↓ A potential decrease in lean tissue catabolism

Reference ¹A.B. World¹, P.R. Broadway², N.C. Burdick Sanchez², Y.L. Liang³, K.P. Sharon⁴, S.L. Roberts⁵, J.T. Richeson⁵, P.J. Defoor⁶, M.D. Cravey⁶, J.R. Corley⁶, M.A. Ballou¹, and J.A. Carroll¹

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