Abstract: The effects of a nutritional packet containing a direct-fed microbial combined with vitamins/electrolytes offered to beef steers in a calf-fed system on growth performance and carcass characteristics were evaluated. Angus crossbred steer-calves (n = 60; BW = 234 ± 4 kg) were assigned to a randomized complete block design (block = body weight; steer = experimental unit) and stratified into two treatments: a) control (no packet, finely-ground corn carrier only); and b) 30 g of DM/animal-daily of a nutritional packet [live-yeast (Saccharomyces cerevisiae; 8.7 Log CFU/g), Vitamin C (5.4 g/kg of Ascorbic acid), Vitamin B1 (13.33 g/kg of Thiamine hydrochloride), and electrolytes of sodium chloride (80 g/kg) and potassium chloride (80 g/kg)]. Animals were individually offered [electronic feed-bunks (Smart-Feed/C-Lock Inc.) a steam-flaked corn-based finishing diet ad libitum, once daily for 233 d. Treatments were offered during the first (phase-1) and last (phase-2) 60 d on feed. Body weight measurements were taken every 30 d before feeding. Data were analyzed using the GLIMMIX procedure of SAS. No treatment × time interactions (P ≥ 0.20) were observed. Steers offered mixture-A experienced 300 min/d less (P = 0.04) time under the ruminal pH 5.6, while showing a greater (P = 0.04) ruminal pH average (5.67 vs. 5.50), and tended (P = 0.06) for a lesser ruminal temperature (39.2 vs. 39.4°C) compared to control. The ruminal concentration of NH$_3$-N was greater (P = 0.02) for mixture-A compared with control (10.78 vs. 4.35 mg/dL), while animals offered mixture-B tended (P = 0.07) to be greater (9.11 mg/dL) than control. Steers offered DFM mixture-A increased (P = 0.04) ADF digestibility compared with control (39.8 vs. 54.0%), while not affecting DM intake (P = 0.61). The DFM mixture-A induced a safer ruminal pH environment and encouraging fiber degradation and NH$_3$-N release, while not affecting animal intake.

Keywords: ammonia, bacterial mixture, digestibility