

THE INVESTIGATION OF DIFFERENT LEVELS OF VITAMIN A AND ITS EFFECTS ON CARCASS TRAITS, AND THE CONVERSION RATE OF EXTERNAL FAT COLOR IN CULL COWS

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I. OBJECTIVES

The study objective was to evaluate different feeding strategies and their effects on fat color, carcass yield, and quality traits in cull cows.

II. MATERIALS AND METHODS

Angus crossbreed cull cows ($n=98$) were used with a feeding time of 56 d under clean bunk management. Cows were blocked by location and year and then divided into 2 feed treatments (8 pens with 7 to 22 cows per pen). Each treatment had 4 replications, and pens were used as the experimental unit. Treatments included low vitamin A (LVA) and high vitamin A (HVA) diets. The LVA diet was formulated using corn, soybean hulls, soybean meal, and a mineral-vitamin supplement. The HVA diet was formulated using corn, fescue hay, distillers dried grains with solubles, and a mineral-vitamin supplement. A subcutaneous fat biopsy was taken in the rump area on 0 d. Fat biopsy consisted of 1 × 1 cm size sample removed after area was shaved and scrubbed, followed by 5 mL of lidocaine used locally. Upon 3 min, a cut with a sterile scalpel was made to remove the subcutaneous fat tissue, bagged, then placed in dry ice and transported back to Ohio State University. Visual evaluation of fat color was conducted by using a 1 to 5 number scale published by the American Meat Science Association ranging as follows: 1, white; 2, creamy white; 3, slightly yellow; 4, moderately yellow; and 5, yellow. Upon day 56, cows were harvested; carcass data were collected 48 h postmortem. Yield and quality grade was evaluated at the 12th/13th rib interface using USDA grading standards. Additionally, subjective visual color score of carcasses was conducted using the same American Meat Science Association 1–5 fat color scale as on 0 d. Statistical analysis was conducted using a proc mixed procedure. The color of the fat from the 0-d biopsy was used as covariable for 56-d fat color. Differences between treatments showing significance was determined at $P \leq 0.05$.

III. RESULTS

Carcass external fat, ribeye size, internal fat percent, and hot carcass weight did not differ ($P > 0.10$) among treatment groups. Similarly, quality traits including skeletal maturity, lean maturity, marbling, and overall quality grade were not significantly affected ($P > 0.10$) by treatment group. Subcutaneous adipose color scores did differ significantly ($P < 0.01$) by treatment. Cows on the LVA treatment exhibited lower color scores compared to HVA (2.19 vs. 2.59) ($P = 0.0039$).

IV. CONCLUSION

Results indicate that feeding strategies with feed ingredients differing in concentration of vitamin A had no effect on carcass yield or quality traits in cull cows; however, the reduction of subjective subcutaneous fat color scores seen in the LVA treatment group lends merit to

the feeding of an LVA diet to cull cows prior to slaughter in order to target a “white-cow” premium.

Keywords: beef, quality traits, subcutaneous fat color, yield