

Effects of co-products from the ethanol industry on pork quality and palatability

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An experiment was conducted to investigate pork quality and palatability of pigs fed distillers dried grain with solubles (DDGS), high-protein distillers dried grains (HP DDG), and corn germ diets. Eighty-four pigs (initial BW: 22 kg \pm 1.7 kg) were allotted to 1 of 7 dietary treatments with 6 replicates per treatment and 2 pigs per pen. Diets were fed for 114 d in a 3-phase sequence. The control diet sequence was based on corn and soybean meal. Two sequences were formulated using 10 or 20% DDGS in each phase. Two additional sequences contained HP DDG in amounts sufficient to substitute either 50 or 100% of the soybean meal used in the control sequence. The last 2 sequences contained 5 or 10% corn germ, which was calculated to provide the same amount of fat as in the 10 and 20% DDGS diets, respectively. Results of the experiment showed that longissimus (LM) marbling, color score, L*, a*, pH, drip loss, and purge loss were not affected by DDGS or HP DDG. However, LM b* decreased (linear, $P < 0.05$) as DDGS and HP DDG were included in the diet. Muscle quality was not influenced by the inclusion of corn germ in the diets, with the exception of a decrease (quadratic, $P < 0.05$) in drip loss as corn germ was added to the diet. There was no effect of DDGS on fat L*, a*, or b*, belly thickness or iodine value but belly firmness decreased (linear, $P < 0.05$) as DDGS was added to the diet. Fat L*, a*, b*, belly thickness, and belly firmness were not influenced by the inclusion of HP DDG or corn germ in the diets, but iodine value increased (linear, $P < 0.05$) in HP DDG diets and decreased (linear, $P < 0.05$) in corn germ diets as inclusion levels increased. Cooking loss, shear force, and bacon distortion

scores were not affected by the inclusion of DDGS, HP DDG, or corn germ in the diet. Bacon crispiness, flavor intensity, and off flavors were not influenced by including DDGS in the diet. However, bacon tenderness decreased (linear and quadratic, $P < 0.05$) as DDGS was included in the diet. Bacon palatability was not affected by the inclusion of HP DDG or corn germ in the diets. There was a diet \times gender interaction ($P < 0.05$) for DDGS inclusion levels for pork chop tenderness and juiciness. Barrows had an increase in pork chop tenderness (quadratic, $P < 0.05$) and juiciness (linear, $P < 0.05$) as DDGS was added to the diet. However, gilts had a decrease in pork chop tenderness, juiciness, and flavor intensity (linear, $P < 0.05$) as inclusion of DDGS increased. A diet \times gender interaction ($P < 0.05$) for pork chop juiciness and flavor intensity was observed as HP DDG inclusion increased. There was an increase (linear, $P < 0.05$) in barrow pork chop juiciness and a decrease (quadratic, $P < 0.05$) in gilt pork chop flavor intensity as the concentration of HP DDG in the diet increased. There was also a diet \times gender ($P < 0.05$) interaction for pork chop juiciness in pigs fed corn germ diets. Off flavor intensity, piggy taste, other off flavors, and total off flavors was not influenced by including DDGS, HP DDG, or corn germ in the diets, but there was a decrease ($P < 0.05$) in metallic taste as DDGS concentration increased in the diet. In conclusion, DDGS and HP DDG do not affect muscle quality but high levels decrease bacon quality. Corn germ does not negatively affect muscle or fat quality and may decrease iodine values. Overall, the palatability of bacon and pork chops was not affected by feeding pigs DDGS, HP DDG, or corn germ.

Key words: High-protein DDG, corn germ, DDGS, pork quality, palatability, pigs