PSIV-5 Can dietary oxidized protein induce oxidative stress in pigs? Carl A. Frame, Logan R. Kilburn, Erika M. Johnson, Mariana C. Rossoni Serao, *Iowa State University*

Endogenous protein oxidation as a result of oxidative stress is known to reduce the efficiency of livestock species (Boler et al., 2012; DeRouchey et al., 2004; Dibner, Atwell, Kitchell, Shermer, & Ivey, 1996). Additionally, rendered by-products are common feedstuffs in livestock diets. During processing, these sources have the potential to become oxidized. While most research on oxidative stress has focused on consumption of dietary oxidized lipids, little research has been done in the area of dietary oxidized proteins and the potential to induce oxidative stress. The objective of this study was to determine the effects of dietary oxidized protein on oxidative stress in pigs. For this study, 30 pigs 6 weeks old were divided into three dietary treatments of control, medium, and high dietary oxidized protein. Each treatment was fed the same diet, with the exception of the degree of oxidation in bovine plasma which was included in the diet at 10 percent. Pigs were fed for 19 days and then euthanized for tissues collected. Jejunum, liver, and colon were collected along with urine and plasma samples on day 0 and 18. Jejunum samples were also collected for histology. Markers of oxidative stress included protein carbonyls, thiobarbituric acid reactive substance (TBARS), 8-hydroxyguanine, and glutathione peroxidase activity. Pigs in the high oxidation treatment had an increase in crypt depth of 16 percent (p-value less than 0.05) when compared to control further resulting in an 11 percent decrease in villi height to crypt depth ratio (p-value less than 0.05). Additionally, lipid oxidation products, measured by TBARS, was 28 percent greater in the liver of pigs in the medium oxidation treatment (p-value less than 0.05) when compared to control. Even with the short duration of this study, dietary oxidized protein did impact the oxidative status of the animal. Using pigs as a model for companion animals, it could be hypothesized then that long-term exposure could have implications on longevity.

Key words: protein oxidation, oxidative stress, swine

PSIV-6 Effect of dietary fiber source on growth performance and carcass characteristics of finishing pigs. Kara M. Dunmire, Lori L. Thomas, Michaela B. Braun, Courtney N. Truelock, Mike D. Tokach, Joel M. DeRouchey, Robert D. Goodband, Jason C. Woodworth, Steve S. Dritz, Chad B. Paulk, *Kansas State University*

A total of 288 pigs (DNA 600 × 241; initially 50.7 kg) were used in an 86-d experiment to determine the effect of dietary fiber source on finishing pig performance. Thirty-six pens of 4 barrows and 4 gilts/pen (total 8 pigs/pen) were randomly assigned to 1 of 3 dietary treatments. Treatments consisted of a corn-soybean meal control (8.7% neutral detergent fiber, NDF), 20% dried distillers grains (DDGS; 13.6% NDF) or 14.5% sugar beet pulp (SBP; 13.6% NDF). Experimental diets were fed from d 0 to 86 in 3 phases. Diets were balanced to constant NE and SID lysine within phase. Net energy values for ingredients were 2,672 kcal/kg, 2,343 kcal/kg, and 1,734 kcal/kg for corn, DDGS, and SBP, respectively. Overall, there was no evidence for treatment difference in ADG or ADFI. Pigs fed DDGS had a tendency for poorer G:F compared to pigs fed the control or 14.5% SBP diets ($P < 0.10$). Caloric efficiency of net energy (NE) was poorer ($P < 0.10$) in pigs fed DDGS compared to those fed control and SBP. There was a tendency for decreased ($P < 0.07$) hot carcass weight and decreased ($P < 0.05$) carcass yield in pigs fed DDGS and SBP compared to those fed the control diet. Loin depth tended to decrease ($P < 0.10$) in pigs fed SBP compared to the control with pigs fed DDGS being intermediate. Therefore, pigs fed DDGS tended to have poorer feed efficiency compared to those fed the control diet or SBP. This can be explained by the overestimation of NE demonstrated by an increase in caloric efficiency. Increasing dietary NDF reduced carcass yield.

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Effect of dietary fiber source on finishing pig performance.

Item	Control	DDGS	SBP	SEM	Probability, $P<$
ADG, g	944	920	932	9.57	0.228
G:F, g/kg	339^{x}	332^{y}	340^{x}	2.87	0.096
HCW, kg	100.0^{x}	97.6^{y}	98.0^{y}	0.757	0.071
Yield, %	75.8^{a}	75.0^{b}	74.6^{b}	0.187	0.001
Caloric efficiency					
ME, kcal/kg	9,768	9,982	9912	84.3	0.203
NE, kcal/kg	$7,439^{x}$	$7,608^{y}$	$7,419^{x}$	63.9	0.086

Key words: dried distillers grains with solubles, neutral detergent fiber, sugar beet pulp