

21 Effects of added dietary protein and fat on subcutaneous adipose tissue when fed differing levels of dried distiller's grains with solubles. M. L. Van Emon*¹, A. F. Musselman¹, P. J. Gunn¹, E. J. Scholljegerdes², M. K. Neary¹, R. P. Lemenager¹, and S. L. Lake¹, ¹Purdue University, West Lafayette, IN, ²USDA-ARS Northern Great Plains Research Laboratory, Mandan, ND.

The objectives of this study were to determine the effects of added dietary protein and fat in dried distiller's grains with solubles (DDGS) on s.c. adipose fatty acid (FA) profiles in finishing lambs. Sixty crossbred lambs (33.17 ± 4.67 kg; 30 ewes; 30 wethers) were allotted into pairs (ewe and wether) and fed one of five isocaloric dietary treatments: 1) a corn based diet with DDGS included to meet CP requirements (25% of DM; CON), 2) CON with DDGS included at twice the amount of CON (50% of DM; 50DDGS), 3) CON with added protein to equal the CP in the 50DDGS diet (CON+CP), 4) CON with added vegetable oil to equal the crude fat of the 50DDGS diet (CON+VO), and 5) CON with protein and crude fat added to equal that of the CP and fat in the 50DDGS diet (CON+CPVO). All data are expressed as concentrations (mg FA/g tissue) of fatty acids. Total fatty acid concentrations of s.c. adipose did not differ ($P = 0.77$) between treatments. Lambs fed 50DDGS, CON+VO, and CON+CPVO had greater ($P = 0.03$) concentrations of 18:1*trans*-11 in s.c. adipose than lambs fed CON+CP. The CON+CP treatment had greater ($P = 0.05$) concentrations of 18:1*cis*-9 in s.c. adipose than lambs fed 50DDGS, CON+VO, and CON+CPVO diets. The lambs fed the CON+CPVO diet had greater concentrations of 18:2*trans*-9, *trans*-12 ($P = 0.04$) and 18:2*cis*-9, *trans*-11 ($P = 0.04$) in s.c. adipose than CON, 50DDGS, and CON+CP, and CON, CON+CP, and CON+VO treatments, respectively. Concentrations of 18:2*cis*-9, *cis*-12 in s.c. adipose were greater ($P = 0.04$) in the CON+CP and 50DDGS diets compared with the CON+CPVO, and the CON+VO and CON+CPVO diets, respectively. Lambs fed the 50DDGS diet had greater concentrations of 18:2*trans*-10, *cis*-12 ($P = 0.02$) compared with all other diets. Generally, the data would suggest that diets with elevated dietary fat appeared to have increased levels of linoleic acid biohydrogenation intermediates deposited in fat depots of finishing lambs.

Key Words: DDGS, Fatty Acids, Lambs