

Lambs were bled (to measure plasma concentration of glucose, and NEFA) and weighed on d 15 and d 60. Data was analyzed using a mixed model of SAS, using a linear and quadratic polynomial contrast for mean separation. There was a quadratic linear effect ($P=0.01$) for BW. Ewes supplemented with 1% PUFA were heavier than ewes supplemented with 0 or 2% (94.8 vs 91.0 and 89.8 ± 1.06 , respectively). There were no difference in BCS, milk production, fat or protein concentration, but there was a trend for increased (linear $P=0.06$) lactose concentration. There was no difference in lamb BW, or plasma glucose and NEFA concentrations ($P>0.1$). However, there was a time by treatment interaction on ADG ($P < 0.05$). Lambs of ewes supplemented with PUFA at 1% showed a higher ADG (0.36 kg/d) than the 0% (0.31 kg/d) or 2% (0.33 kg/d) supplementation from birth to d 15. The ADG from d 15 to d 60 was similar for the three treatments. This suggests that the supplementation of EPA and DHA during gestation affects ewe and lamb growth, and these effects may be dose dependent. The fact that the 1% EPA and DHA supplement showed a heavier BW for the ewes and the highest ADG for the lambs without affecting in the same manner MY or composition arises more questions to be answered on the biological effects of PUFA.

Key Words: n-3 PUFA, fetal programming, Energy

482 Determination of the Minimum Inhibitory Concentration of Various Medium Chain Fatty Acid-Based Products in *E. coli*, Enterotoxigenic *E. coli*, and *Campylobacter coli*.

A. J. Swanson^{*1}, R. A. Cochrane¹, R. G. Amachawadi¹, S. Remfry¹, A. B. Lerner¹, T. G. Nagaraja¹, J. R. Pluske², M. C. Niederwerder³, C. R. Stark¹, C. B. Paulk¹, J. C. Woodworth¹, S. S. Dritz¹, M. D. Tokach¹, J. M. DeRouchey¹, R. D. Goodband¹, C. K. Jones¹, ¹Kansas State University, Manhattan, KS, ²Murdoch University, Western Australia, Australia, ³Department of Diagnostic Medicine/Pathobiology, Kansas State University, Manhattan, KS

Research has demonstrated medium chain fatty acids (MCFA) are bactericidal and potential antibiotic alternatives. However, it is unknown how the type or level of MCFA impact bacteria growth. This can be tested through a minimum inhibitory concentration (MIC) benchtop assay, which identifies the lowest concentration of a chemical that prevents visible growth of a bacterium. Our objective was to determine the MIC of pure MCFA (Experiment 1) and products containing

Experiment 1. Mean Minimum Inhibitory Concentration of Synthetic MCFA, %

Item	<i>E. coli</i>	ETEC	Campy	Pooled SEM	<i>P</i> =
C6:0	0.70 ^c	0.53 ^{ef}	0.50 ^{fg}	0.0316	<.0001
C8:0	0.85 ^b	0.67 ^{cd}	0.47 ^{fg}		
C10:0	1.00 ^a	1.00 ^a	0.90 ^b		
C6:C8:C10 Blend	0.60 ^{de}	1.00 ^a	0.43 ^g		

Experiment 2. Mean Minimum Inhibitory Concentration of Developmental MCFA Products, %

Item	<i>E. coli</i>	ETEC	Campy	Pooled SEM	<i>P</i> =
Product 1	0.37	0.33	1.20	0.4730	0.486
Product 2	1.20	1.30	0.33		
Product 3	3.33	3.83	2.75		
Product 4	4.17	4.33	3.33		
Coconut oil	>5.00	>5.00	>5.00		

MCFA (Experiment 2) against generic *E. coli*, enterotoxigenic *E. coli* (ETEC), or *Campylobacter coli* (campy). Experiment 1 used a 4 × 3 factorial with four types of pure MCFA (C6:0, C8:0, C10:0, or 1:1:1 blend of C6:C8:C10) against the three bacteria and was repeated 3 times. All interactions and main effects were significant ($P<0.05$). The most effective ($P<0.05$) pure MCFA tested against generic *E. coli* was the 1:1:1 blend of C6:C8:C10, and against ETEC was C6:0. All tested pure MCFA had similar ($P>0.05$) MIC against campy. This demonstrated that MCFA efficacy varies with MCFA type and bacteria. Pure MCFA are expensive and not easily available to producers. Thus, 24 commercially-available and developmental products were analyzed for MCFA concentration, with 5 selected based on their C6:0, C8:0, and C10:0 concentrations. In Experiment 2, these products were used in a 5 × 3 factorial to determine their MIC using the same procedures in Experiment 1. There were 5 MCFA products (4 developmental products + coconut oil) tested against three bacteria (*E. coli*, ETEC, and campy). Only the main effect of treatment was significant, resulting in products 1 and 2 having a lower ($P<0.05$) MIC than products 3, 4, and coconut oil. In summary, pure MCFA were bactericidal to *E. coli*, ETEC, and campy. However, their efficacy varied between bacteria. The efficacy of potential commercial products can be predicted based on their MCFA concentration, with the shorter chain MCFA having greater efficacy in the tested bacteria.

Key Words: Medium Chain Fatty Acids, *E. coli*, Swine

483 Effects of Standardized Ileal Digestible Lysine on 7-15 Kg Nursery Pigs Growth Performance.

G. E. Nichols^{*}, C. M. Vier, A. B. Lerner, M. B. Menegat, H. S. Cemin, C. K. Jones, J. M.