Reduced growth performance of pigs fed methionine deficient diet may be associated with their reduced muscle cell differentiation. Shengfa F. Liao, Zhongyue Yang, M. Shamimul Hasan, Rebecca Humphrey, Jean Feugang, Derris Burnett, John K. Hto, 1 Mississippi State University, 2 Mississippi State University, 3 Evonik Nutrition & Care GmbH

Metionine (Met) is the second or third limiting AA in typical swine diets and plays important roles in promoting the growth, especially, the muscle growth of pigs. This research studied the effects of dietary Met restriction on growth performance and myogenic gene expression in growing pigs. Eight genes in two families, including myogenic regulatory factor family comprising myogenic differentiation 1 (MyoD1), myogenic factor 5 (Myf5), myogenin (MyoG) and myogenic factor 6 (Myf6), and myocyte enhancer factor 2 (Mef2) family comprising Mef2A, Mef2B, Mef2C and Mef2D, were selected for analysis. Individually penned barrows (crossbred, 23.6±2.4 kg) were randomly assigned to two dietary treatments. A basal diet (Diet 1; Met-deficient) was formulated to contain 0.22% standardized ileal digestible (SID) Met and 0.52% SID Met+Cys but to meet the NRC (2012) recommendations for other nutrients. Crystalline DL-Met was added to the basal diet to generate Diet 2 adequate in Met (0.37% SID Met, 0.67% SID Met+Cys). During the four-week ad libitum feeding trial, ADG, ADFI and G:F were measured. Immediately before and after the trial, muscle samples were collected from the longissimus dorsi using a standard biopsy protocol. Total RNA was extracted from the muscle samples (TRIZol Reagent; Invitrogen) and subjected to cDNA reverse-transcription (QuantiTect Reverse Transcription Kit; Qiagen). Transcribed cDNA were used for qPCR analysis (Rotor-Gene Q System; Qiagen). Comparative ΔΔCT method was used for quantitation. Data were analyzed with Student’s T-test. Pigs fed Diet 1 (vs. Diet 2) had a lower ADG and G:F (P<0.01). Before the feeding trial, all the tested genes had comparable mRNA levels between the two treatments (P >0.17). After the trial, Diet 1 pigs showed tendency for lower levels of Myf6 and Mef2D mRNA (P<0.09). These results suggest that the reduced ADG and G:F is associated with the possibly-reduced muscle cell differentiation in pigs fed Met-deficient diet.

**Keywords:** methionine, myogenic gene, growing pig