

305 Effects of dietary fiber on the optimum threonine:lysine ratio for 25- to 50-kg gilts. John K. Mathai*¹, John K. Htoo², John Thomson³, Kevin J. Touchette⁴, and Hans H. Stein¹, ¹*University of Illinois, Urbana, IL*, ²*Evonik Industries AG, Hanau-Wolfgang, Hesse, Germany*, ³*Evonik Degussa Corporation, Kennesaw, GA*, ⁴*Ajinomoto Heartland Inc., Chicago, IL*.

Two experiments were conducted to determine the effect of dietary fiber on the ideal Thr:Lys ratio for 25 to 50 kg gilts. In Exp. 1, 192 gilts (26.3 ± 4.64 kg) were used with 2 pigs/pen and 8 pens/trt. A 2×6 factorial arrangement was used to determine the effect of dietary fiber (low and high) and standardized ileal digestible (SID) Thr:Lys ratios 45, 54, 63, 72, 81, and 90:100. At both fiber levels, ADG and G:F increased quadratically ($P < 0.05$), as the concentration of Thr increased in the diets. For pigs fed low-fiber diets, broken-line analyses estimated the optimum SID Thr:Lys ratio for ADG and G:F, respectively, as 0.60 and 0.59, quadratic analyses as 0.76 and 0.73, and combined linear-quadratic analyses as 0.66 and 0.63. For pigs fed high fiber diets, broken-line analyses estimated the optimum SID Thr:Lys ratio for ADG and G:F, respectively, as 0.66 and 0.55, quadratic analyses as 0.80 and 0.75, and combined linear-quadratic analyses as 0.71 and 0.63. In Exp. 2, pigs were fed either low-fiber or high-fiber diets that were very deficient (0.45 SID Thr:Lys) or marginally deficient (0.60 SID Thr:Lys) in Thr. Thirty-six gilts (29.0 ± 0.74 kg) were housed in metabolism crates with 9 replicate pigs per diet. Output of N in feces was greater ($P < 0.05$) from pigs fed high-fiber diets, whereas output of N in urine was greater ($P < 0.05$) from pigs fed low-fiber diets. The ATTD of N and retention of N were greater ($P < 0.05$) in pigs fed low-fiber diets. There was a lower ($P < 0.05$) N output in urine and a greater ($P < 0.05$) N retention in pigs fed high-Thr diets with 0.60 SID Thr:Lys compared with pigs fed low-Thr diets containing 0.45 SID Thr:Lys. There was also an interaction ($P < 0.05$) between fiber level and Thr for output of N in feces with N output increasing ($P < 0.05$) as Thr in the high-fiber diet increased. Results of these experiments indicate that increased fiber levels in diets fed to growing gilts increase the requirement for Thr, and diets with higher fiber levels should, therefore, include a greater concentration of Thr.

Key Words: pig, fiber, threonine