

***In vitro* digestibility techniques to predict digestible energy content of common ingredients and feed samples in grower pigs**

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Energy is the most expensive component of swine diets. Thus, prediction of the digestible energy (DE) content of ingredients and mixed feed is important to properly balance feed formulations or predict growth performance. An *in vitro* digestibility technique using pepsin for 2 h, pancreatin for 6 h, and Viscozyme for 18 h, a fiber-digesting enzyme, to mimic *in vivo* digestion might be an accurate and repeatable method to predict the DE content in swine. A study was designed to test the ability of this *in vitro* technique to predict the variation in DE content across mixed feeds and ingredients with a wide range in quality such as corn, wheat, barley, field pea, soybean meal, corn DDGS, canola meal, and wheat millrun and to develop equations to predict DE content of the ingredients in swine. The range of ADF, ether extract and CP content in the diet samples ranged from 3.54 to 10.51, 1.58 to 7.85, and 9.79 to 26.70% and in the ingredient samples ranged from 3.02 to 16.96, 1.43 to 12.36 and 9.61 to 52.09%, respectively. The DE content of the mixed diets and ingredients determined by total tract digestibility experiments using barrows ranged from 3.18 to 3.69 and 1.82 to 3.18 Mcal/kg, respectively. *In vitro* DE of the mixed diets and ingredients ranged from 3.05 to 3.70 and 2.71 to 4.08 Mcal/kg, respectively. *In vitro* DE was strongly related with *in vivo* DE across mixed diets ($R^2 = 0.81$, $Y = 0.65x + 1.22$) and ingredients ($R^2 = 0.86$, $Y = 1.02x - 0.13$). Hence, the *in vitro* digestibility technique can accurately predict the variation in DE contents across mixed diets and ingredients in swine.

Implication: The regression equation developed in the present study can be used to estimate the variation in DE content across ingredients and mixed diets in swine. The *in vitro* technique can also be useful to calibrate near infrared reflectance spectroscopy so that DE content can be predicted rapidly in field situations.