

**187 Chemical composition and physicochemical characteristics of feed ingredients and effects on in vitro ileal and total tract digestibility of dry matter.**

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It is necessary to have a complete account of all measurable components of a feed ingredient or diet to accurately predict a pig's response to high fiber diets. Therefore, an experiment was conducted to quantify and characterize fiber fractions of feed ingredients that vary in concentrations of soluble and insoluble dietary fiber (IDF) and to determine in vitro DM digestibility. The ingredients used were corn, wheat, soybean meal, canola meal, corn distillers dried grains with solubles (DDGS), corn germ meal, copra expellers, and sugar beet pulp. Cellulose (SF) and pectin were also included to represent purified synthetic sources of insoluble and soluble fiber, respectively. The in vitro apparent total tract digestibility (IVATTD) was determined using a 3-step procedure modified from Boisen and Fernández (1997). For in vitro apparent ileal digestibility (IVAID), the same procedure was used, but the process was discontinued after the second step. Analyses were performed in triplicates with the exception of viscosity which was performed in quadruplicates. Correlation coefficients between the physicochemical characteristics of the feed ingredients and the IVAID and IVATTD of DM were determined to identify relationships between measurable components of feed ingredients and DM digestibility. Results indicated that the analyzed nutrient composition of all ingredients added to 100% or greater, except for SF, which added to only 96.09%. However, the difference between the calculated GE of the analyzed components and the analyzed GE of the ingredients ranged from -0.97 MJ/kg in DDGS to 1.74 MJ/kg in pectin. Bulk density was negatively correlated ( $P < 0.05$ ) with NDF ( $r = -0.78$ ) and ADF ( $r = -0.69$ ). Soluble dietary fiber was positively correlated ( $P < 0.05$ ) with viscosity ( $r = 1.00$ ) and swelling ( $r = 0.64$ ). Swelling was also positively correlated ( $P < 0.01$ ) with water binding capacity ( $r = 0.89$ ). Concentration of total dietary fiber (TDF) was negatively correlated ( $P < 0.05$ ) with IVAID ( $r = -0.65$ ) and IVATTD ( $r = -0.76$ ) of DM. Concentration of IDF was also negatively correlated ( $P < 0.01$ ) with IVAID ( $r = -0.87$ ) and IVATTD ( $r = -0.92$ ) of DM. The stronger correlation between IDF and TDF with in vitro DM digestibility indicates that these methods of measuring fiber are more appropriate in evaluating digestibility compared with NDF and ADF. Physical characteristics of the feed ingredients were not correlated with in vitro DM digestibility, which indicates that these parameters do not influence

digestibility of feed ingredients in vitro.

**Key Words:** dietary fiber, in vitro digestibility,  
physicochemical characteristics  
doi: 10.2527/asasmw.2017.12.187