in previous research, we showed that roller mill (RM) ground corn flows better than hammermill (HM) ground corn with a hammer mill (HM), and decreasing particle size and increasing fat decreases flow ability. Therefore, the objective of these experiments was to determine if the flow differences between HM and RM ground corn were due to the particle size standard deviation (PSSD). In both Exp., RM and HM corn samples were sifted through 13 screens and material from each screen was collected. Samples were dried 12 h to equalize moisture content. Soy oil was then added at 0, 4, and 8 % to samples. Flow ability was then determined by measuring angle of repose (the maximum angle measured in degrees at which a pile of grain retains its slope). A large angle of repose represents a steeper slope and poorer flow ability. In Exp. 1, we created 5 RM samples with mean particle size ranging from 1415 to 343 microns and 5 HM samples from 1382 to 333 microns. All samples were created to have similar PSS3 values ranging from 1.1 to 1.3. There was an interaction (P<0.05) between particle size, added fat, and mill type. Increasing fat increased angle of repose; however, the difference was less in fine ground HM samples than in the RM samples. In RM samples, decreasing particle size had less of an impact on flow ability than in HM ground corn. In Exp. 2, we used 4 RM and 4 HM samples that were constructed from the previously collected grain. All samples were similar in mean particle size (641 to 679 microns) with varying PSSD (1.62 to 2.27). There was no interaction (P>0.10) of fat x PPSD x mill type interaction observed. Increasing fat (P<0.04) and PSSD (P<0.001) decreased flow ability. These data suggest that the greater flow ability of RM ground corn appears to be a result of less particle size variation. However, with fine particle sizes (<700 microns) other factors, such as particle shape, may also contribute to flow ability.

Key Words: Particle size, Hammer mill, Roller mill


Three experiments were conducted to compare the effects of increasing solvent extracted soybean meal (SBM) and extruded-expelled soybean meal (EESOY) in diets for early-weaned pigs. All pigs (PIC; 5 pigs/pen) were separated into 5 animal groups to assess the addition of EESOY decreased ADG, ADFI, and G:F (linear, P<0.01). Increasing fat x PPSD x mill type interaction observed. Increasing fat (P<0.04) and PSSD (P<0.001) decreased flow ability. These data suggest that the greater flow ability of RM ground corn appears to be a result of less particle size variation. However, with fine particle sizes (<700 microns) other factors, such as particle shape, may also contribute to flow ability.

Key Words: Soybean meal, Pork, Performance


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