

Predictability of Body Weight Changes in Sows during Gestation

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The pork industry's focus on economic efficiency and environmental sustainability underscores the need for greater precision in defining nutrient requirements. The objective of this study was to validate a factorial approach to defining daily digestible energy (DE) requirements for gestating sows.

Feed allowance in gestation was determined factorially for 419 multiparous sows based on estimated daily DE requirements for maintenance (110 kcal DE/kg BW.75), growth of conceptus and related tissue (411 kcal DE/d) and maternal BW gain (partitioned into protein and lipid deposition). Target maternal BW gains, including gain of the conceptus and reproductive tissues, were 55, 50, 40, 30 and 20 kg for parities 1, 2, 3, 4 and 5 or higher (5+), respectively. Sows gained an average of 10.6 kg above the target total gestation BW gain. To further evaluate the factorial estimation of DE requirements, the daily DE intake for each sow was entered into the new NRC (1998) gestation model to compare actual vs. predicted changes in sow BW during gestation. The deviation between the predicted and actual gains (NRC prediction – actual BW gain) were $-6.8 \pm .8$, $-6.2 \pm .8$, -1.4 ± 1.6 , $.1 \pm 1.4$, 4.5 ± 1.7 , 1.1 ± 2.0 , 7.8 ± 3.2 and 9.0 ± 3.9 kg for parities 1 through 8, respectively. A positive correlation was found between actual BW gain in gestation and the number of piglets born ($r = .37, .34, .50, .29$ and $.15$ for parity 1, 2, 3, 4 and 5+, respectively; $P < .05$).

Implications

Using a factorial approach to determining nutrient requirements of the sow in gestation allows for a greater understanding of the relationship among BW changes, productivity and nutrient intake. This will improve the precision of gestation diet formation and hence, overall production efficiency and sustainability.