
47 Effects of Various Heat Treatments on Concentrations of Digestible and Metabolizable Energy and on Amino Acid Digestibility in Soybean Meal Fed to Growing Pigs. J. K.

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Two experiments were conducted to determine DE and ME and standardized ileal digestibility (SID) of AA in heat-treated soybean meal (SBM) fed to growing pigs. The 9 treatments were prepared using a conventional SBM that was either not autoclaved or autoclaved following one of 8 treatments: 110°C for 15 or 30 min or 150°C for 3, 6, 9, 12, 15 or 18 min. In Exp. 1, 20 barrows (43.6 ± 2.2 kg) were assigned to a replicated 10 treatment \times 4 period Youden square design. A corn-based basal diet and 9 diets containing corn and one of each SBM treatment were formulated. Urine and feces were collected for 5 d. In Exp. 2, 10 ileal-cannulated barrows (36.8 ± 1.2 kg) were allotted to a 10 treatment \times 7 period Youden square design. A N-free diet and one diet for each of the 9 SBMs were used. Ileal

Table 1. Metabolizable energy and SID of AA in SBM

Item	Heating temperature								
	Control	110°C			150°C				
Duration (min):		15	30	3	6	9	12	15	18
ME, kcal/kg DM ^{1,2}	3,665	3,708	3,696	3,443	3,358	3,201	2,862	2,561	2,562
SID of AA, %									
Lys ^{1,2}	94.8	94.1	93.3	84.2	80.7	80.1	75.9	74.9	62.6
Met ^{1,2}	94.3	93.1	93.2	88.1	87.6	87.7	86.3	86.3	80.3
Thr ^{1,2}	89.8	89.2	89.9	83.3	82.2	82.8	81.2	81.8	74.8
Trp ^{1,2}	89.2	88.3	89.9	83.5	83.2	83.4	81.4	82.2	76.8

¹110°C vs. 150°C: $P < 0.001$.

²Linear effect of heating time at 150°C: $P < 0.001$.

digesta were collected on d 6 and 7 of each 7-d period. Orthogonal contrasts were used to compare effects among treatment temperatures and to determine linear effects of heating duration. There were no effects of autoclaving at 110°C on ME in SBM or on SID of AA in SBM, but both ME and SID of AA in SBM were less ($P < 0.01$) if SBM was autoclaved at 150°C compared with 110°C (Table 1). At 150°C, there were linear decreases ($P < 0.01$) in both ME and SID of AA in SBM as heating time increased. In conclusion, autoclaving at 110°C did not affect ME or SID of AA in SBM, but autoclaving at 150°C had negative effects on ME and SID of AA in SBM as heating time increased.

Key Words: pigs, heat treatment, soybean meal