**Supplementary Material**

**Amino acid utilization and body composition of growing pigs fed processed soybean meal or 00-rapeseed meal with or without amino acid supplementation**

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| **Supplementary Table S1** *Composition of the organ and carcass fraction of pigs (n = 5) slaughtered at BW of 17.0 ± 1.2 kg to determine initial body composition* | | | | |
| Item | Organ fraction | SEM | Carcass fraction | SEM | |
| Proximate components, g/kg as-is basis |  |  |  |  | |
| Water | 796.8 | 3.1 | 659.8 | 3.5 | |
| Ash | 11.2 | 0.2 | 37.2 | 0.6 | |
| Ether extract | 26.4 | 1.8 | 117.7 | 3.4 | |
| N | 23.0 | 0.4 | 28.1 | 0.4 | |
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| Amino acids, g/100 g CP |  |  |  |  | |
| Arginine | 4.81 | 0.07 | 6.45 | 0.08 | |
| Histidine | 2.96 | 0.04 | 2.42 | 0.11 | |
| Isoleucine | 3.10 | 0.03 | 3.71 | 0.14 | |
| Leucine | 8.72 | 0.03 | 6.76 | 0.20 | |
| Lysine | 6.33 | 0.16 | 6.84 | 0.27 | |
| Methionine | 1.46 | 0.03 | 1.98 | 0.05 | |
| Phenylalanine | 4.63 | 0.03 | 3.77 | 0.10 | |
| Threonine | 3.78 | 0.02 | 3.78 | 0.12 | |
| Tryptophan | 1.19 | 0.01 | 0.92 | 0.04 | |
| Valine | 5.92 | 0.04 | 4.50 | 0.14 | |
| Alanine | 6.34 | 0.07 | 6.22 | 0.08 | |
| Aspartic acid | 8.73 | 0.20 | 8.10 | 0.20 | |
| Cysteine | 1.08 | 0.01 | 0.95 | 0.02 | |
| Glutamic acid | 11.11 | 0.29 | 13.49 | 0.34 | |
| Glycine | 6.21 | 0.06 | 8.53 | 0.36 | |
| Proline | 4.60 | 0.04 | 5.83 | 0.17 | |
| Serine | 4.03 | 0.09 | 3.79 | 0.08 | |
| Tyrosine | 2.93 | 0.06 | 2.85 | 0.10 | |

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| **Supplementary Table S2** *Effect of protein source, diet type, and their interaction on nutrient retention (g/d) in the organ fraction of growing pigs fed 1 of 6 experimental diets: SBM, pSBM, pSBM+AA, RSM, pRSM, or pRSM+AA1,2* | | | | | | | | | | |
| Item | Diet | | | | | |  | *P*-value | | |
| SBM | pSBM | pSBM + AA | RSM | pRSM | pRSM + AA | SEM | Protein source | Diet type | Protein source × diet type |
| Water | 63.7ab | 41.2d | 68.1a | 55.9bc | 39.6d | 52.3c | 2.3 | <0.001 | <0.001 | 0.013 |
| Ash | 1.0a | 0.5cd | 0.8ab | 0.7bc | 0.5d | 0.6cd | 0.0 | <0.001 | <0.001 | 0.026 |
| Ether extract | 4.9ab | 5.9a | 4.1b | 5.1ab | 5.9a | 5.4a | 0.3 | 0.050 | <0.001 | 0.055 |
| N | 2.0a | 1.2c | 2.0a | 1.6b | 1.2c | 1.6b | 0.1 | <0.001 | <0.001 | <0.001 |
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| Amino acid |  |  |  |  |  |  |  |  |  |  |
| Arginine | 0.57a | 0.38c | 0.57a | 0.50ab | 0.36c | 0.47b | 0.02 | 0.001 | <0.001 | 0.157 |
| Histidine | 0.42a | 0.26c | 0.41a | 0.34b | 0.25c | 0.32b | 0.01 | <0.001 | <0.001 | 0.009 |
| Isoleucine | 0.35a | 0.23c | 0.37a | 0.28b | 0.21c | 0.28b | 0.01 | <0.001 | <0.001 | 0.017 |
| Leucine | 1.19a | 0.73c | 1.20a | 0.95b | 0.70c | 0.92b | 0.03 | <0.001 | <0.001 | 0.002 |
| Lysine | 0.84a | 0.43c | 0.84a | 0.65b | 0.42c | 0.66b | 0.03 | <0.001 | <0.001 | 0.005 |
| Methionine | 0.17a | 0.11c | 0.17a | 0.14b | 0.10c | 0.14b | 0.01 | 0.001 | <0.001 | 0.112 |
| Phenylalanine | 0.62a | 0.38c | 0.62a | 0.50b | 0.36c | 0.48b | 0.02 | <0.001 | <0.001 | 0.003 |
| Threonine | 0.47a | 0.29c | 0.48a | 0.39b | 0.28c | 0.37b | 0.01 | <0.001 | <0.001 | 0.012 |
| Tryptophan | 0.15a | 0.10c | 0.14a | 0.12b | 0.09c | 0.11b | 0.00 | <0.001 | <0.001 | 0.007 |
| Valine | 0.78a | 0.51c | 0.80a | 0.63b | 0.47c | 0.62b | 0.02 | <0.001 | <0.001 | 0.008 |
| Alanine | 0.82a | 0.53c | 0.84a | 0.65b | 0.50c | 0.65b | 0.03 | <0.001 | <0.001 | 0.008 |
| Aspartic acid | 1.20a | 0.74c | 1.20a | 0.95b | 0.68c | 0.91b | 0.03 | <0.001 | <0.001 | 0.005 |
| Cysteine | 0.15a | 0.09c | 0.15a | 0.12b | 0.09c | 0.12b | 0.00 | <0.001 | <0.001 | 0.001 |
| Glutamic acid | 1.43a | 0.87c | 1.43a | 1.15b | 0.81c | 1.14b | 0.04 | <0.001 | <0.001 | 0.020 |
| Glycine | 0.77a | 0.51bc | 0.77a | 0.62b | 0.47c | 0.62b | 0.03 | <0.001 | <0.001 | 0.095 |
| Proline | 0.58a | 0.39bc | 0.62a | 0.48b | 0.36c | 0.47b | 0.02 | <0.001 | <0.001 | 0.025 |
| Serine | 0.54a | 0.33c | 0.54a | 0.44b | 0.31c | 0.43b | 0.02 | <0.001 | <0.001 | 0.019 |
| Tyrosine | 0.32ab | 0.21cd | 0.34a | 0.27bc | 0.19d | 0.25c | 0.01 | <0.001 | <0.001 | 0.049 |
| a,b,c,d Least squares means within a row with different superscripts differ significantly at *P*<0.05.  1 SBM = soybean meal and RSM = rapeseed meal. Diet type included the factor processing (pSBM and pRSM) and processing plus supplementing with crystalline amino acids to standardized ileal digestible amino acid levels in the SBM (pSBM+AA) and RSM (pRSM+AA) diets.  2 Least squares means for 9 pigs for water, ash, ether extract, and N and 6 pigs for individual amino acids. | | | | | | | | | | |

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| **Supplementary Table S3** *Effect of protein source, diet type, and their interaction on nutrient retention (g/d) in the carcass of growing pigs fed 1 of 6 experimental diets: SBM, pSBM, pSBM+AA, RSM, pRSM, or pRSM+AA1,2* | | | | | | | | | | |
|  | Diet | | | | | |  | *P*-value | | |
| Item | SBM | pSBM | pSBM + AA | RSM | pRSM | pRSM + AA | SEM | Protein source | Diet type | Protein source × diet type |
| Water | 326.8a | 182.0c | 306.4b | 243.2b | 189.6c | 258.1b | 5.2 | <0.001 | <0.001 | <0.001 |
| Ash | 16.8a | 12.1b | 16.2a | 13.0b | 12.3b | 13.3b | 0.6 | <0.001 | <0.001 | 0.002 |
| Ether extract | 91.5c | 112.0ab | 85.1c | 105.1ab | 118.2a | 104.9b | 3.1 | <0.001 | <0.001 | 0.107 |
| N | 14.7a | 7.1d | 13.6b | 10.3c | 8.1d | 10.8c | 0.2 | <0.001 | <0.001 | <0.001 |
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| Amino acid |  |  |  |  |  |  |  |  |  |  |
| Arginine | 5.96a | 2.82c | 5.32a | 4.01b | 3.19c | 4.14b | 0.15 | <0.001 | <0.001 | <0.001 |
| Histidine | 2.91a | 1.36c | 2.57a | 1.63bc | 1.55bc | 1.88b | 0.10 | <0.001 | <0.001 | <0.001 |
| Isoleucine | 3.58a | 1.61e | 3.12ab | 2.31cd | 1.89de | 2.59bc | 0.14 | <0.001 | <0.001 | <0.001 |
| Leucine | 6.45a | 2.88d | 5.63a | 4.14bc | 3.63cd | 4.62b | 0.22 | <0.001 | <0.001 | <0.001 |
| Lysine | 6.64a | 2.88d | 5.98a | 4.28bc | 3.49cd | 4.85b | 0.23 | <0.001 | <0.001 | <0.001 |
| Methionine | 1.98a | 0.91e | 1.76ab | 1.28cd | 1.03de | 1.46bc | 0.07 | <0.001 | <0.001 | <0.001 |
| Phenylalanine | 3.63a | 1.63d | 3.22a | 2.28bc | 1.93cd | 2.53b | 0.12 | <0.001 | <0.001 | <0.001 |
| Threonine | 3.55a | 1.60d | 3.21a | 2.31bc | 1.90cd | 2.60b | 0.12 | <0.001 | <0.001 | <0.001 |
| Tryptophan | 0.86a | 0.37d | 0.84a | 0.55bc | 0.45cd | 0.59b | 0.03 | <0.001 | <0.001 | <0.001 |
| Valine | 4.21a | 1.88d | 3.76a | 2.76bc | 2.21cd | 3.01b | 0.15 | <0.001 | <0.001 | <0.001 |
| Alanine | 5.73a | 2.69c | 5.18a | 3.84b | 3.10c | 3.92b | 0.14 | <0.001 | <0.001 | <0.001 |
| Aspartic acid | 7.62a | 3.44d | 6.88a | 4.98bc | 4.04cd | 5.57b | 0.23 | <0.001 | <0.001 | <0.001 |
| Cysteine | 0.93a | 0.43d | 0.79ab | 0.64bc | 0.48cd | 0.68b | 0.04 | 0.004 | <0.001 | 0.003 |
| Glutamic acid | 12.53a | 5.75d | 11.27a | 8.37bc | 6.73cd | 9.03b | 0.39 | <0.001 | <0.001 | <0.001 |
| Glycine | 7.53a | 3.79c | 6.87a | 5.40b | 4.06c | 4.66bc | 0.29 | <0.001 | <0.001 | <0.001 |
| Proline | 5.34a | 2.73d | 5.12a | 3.78b | 2.99cd | 3.54bc | 0.17 | <0.001 | <0.001 | <0.001 |
| Serine | 3.50a | 1.62c | 3.22a | 2.32b | 1.87c | 2.52b | 0.10 | <0.001 | <0.001 | <0.001 |
| Tyrosine | 2.70a | 1.21e | 2.37ab | 1.73cd | 1.43de | 1.96bc | 0.10 | <0.001 | <0.001 | <0.001 |
| a,b,c,d,e Least squares means within a row with different superscripts differ significantly at *P*<0.05.  1 SBM = soybean meal and RSM = rapeseed meal. Diet type included the factor processing (pSBM and pRSM) and processing plus supplementing with crystalline amino acids to standardized ileal digestible amino acid levels in the SBM (pSBM+AA) and RSM (pRSM+AA) diets.  2 Least squares means for 9 pigs for water, ash, ether extract, and N and 6 pigs for individual amino acids. | | | | | | | | | | |