Barrows and gilts (PIC 29 × 380, n = 147) were blocked by initial BW (6.42 ± 1.21 kg) at weaning (21 ± 3 d) and allotted to pens (7 pigs/pen) within each of 7 blocks to evaluate the effects of aggressive feed-grade AA supplementation with reduced CP diets formulated on either a ME or NE basis on growth performance of nursery pigs. Pens within blocks were randomly assigned to 1 of 3 treatments: 1) corn-SBM-corn DDGS-based diets formulated to meet the Trp requirement without addition of feed-grade Trp (feed-grade Trp was added in phase 3 to increase the Trp:Lys ratio from 17 to 19; Ctrl); 2) RCP diets formulated to meet the His:Lys ratio requirement (His:Lys = 32) without added feed-grade His and formulated on a ME basis (RCP-ME); or 3) RCP diets to meet the His:Lys requirement without feed-grade His and formulated on a NE basis (RCP-NE). Feed-grade AA were added to diets to meet all SID AA:Lys ratio requirements (M+C:Lys, 58; Thr:Lys, 60; Trp:Lys, 17 in phase 1 and 2 and 19 in phase 3; Ile:Lys, 55; Val:Lys, 65 in phase 1 and 2 and 70 in phase 3; His:Lys, 32) during each phase. During phases 1 and 2, feed-grade AA in RCP diets completely replaced poultry byproduct and partially replaced SBM in Ctrl diets. In phase 3, feed-grade AAs were included at the expense of SBM. Poultry fat was reduced in NE compared to ME-based diets. Neither ADG, ADFI, G:F, nor BW at the end of phases 1 and 2, as well as the end of the study, were affected (P ≥ 0.40) by high inclusion levels of feed-grade AA in either ME- or NE-formulated diets. These results indicate that similar performance can be achieved with either ME- or NE-based nursery diets formulated to meet the His:Lys ratio without adding feed-grade His when supplemented with high levels of essential feed-grade amino acids to meet the AA:Lys ratios.

Key Words: Reduced crude protein, Feed-grade amino acids, Nursery pigs
doi: 10.2527/msasas2016-198

Table 198.

<table>
<thead>
<tr>
<th>Item</th>
<th>Treatments</th>
<th>Ctrl</th>
<th>RCP-ME</th>
<th>RCP-NE</th>
<th>SEM</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall ADG, kg</td>
<td></td>
<td>0.46</td>
<td>0.44</td>
<td>0.47</td>
<td>0.02</td>
<td>0.403</td>
</tr>
<tr>
<td>Overall ADFI, kg</td>
<td></td>
<td>0.73</td>
<td>0.70</td>
<td>0.72</td>
<td>0.03</td>
<td>0.651</td>
</tr>
<tr>
<td>Overall Gain:Feed</td>
<td></td>
<td>0.64</td>
<td>0.64</td>
<td>0.65</td>
<td>0.02</td>
<td>0.765</td>
</tr>
<tr>
<td>Final BW, kg</td>
<td></td>
<td>24.4</td>
<td>23.8</td>
<td>24.7</td>
<td>1.0</td>
<td>0.404</td>
</tr>
</tbody>
</table>

Table 199.

<table>
<thead>
<tr>
<th>Item</th>
<th>CTRL</th>
<th>3%</th>
<th>6%</th>
<th>3%</th>
<th>6%</th>
<th>3%</th>
<th>6%</th>
<th>Lin.</th>
<th>Quad.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADG, g</td>
<td>249</td>
<td>266</td>
<td>288</td>
<td>279</td>
<td>239</td>
<td>268</td>
<td>264</td>
<td>0.003</td>
<td>0.059</td>
</tr>
<tr>
<td>ADFI, g</td>
<td>329</td>
<td>344</td>
<td>354</td>
<td>353</td>
<td>330</td>
<td>332</td>
<td>335</td>
<td>0.247</td>
<td>0.323</td>
</tr>
<tr>
<td>G:F</td>
<td>0.76</td>
<td>0.78</td>
<td>0.81</td>
<td>0.79</td>
<td>0.73</td>
<td>0.81</td>
<td>0.79</td>
<td>0.005</td>
<td>0.130</td>
</tr>
<tr>
<td>Final BW, kg</td>
<td>9.98</td>
<td>10.23</td>
<td>10.52</td>
<td>10.40</td>
<td>9.87</td>
<td>10.26</td>
<td>10.19</td>
<td>0.034</td>
<td>0.192</td>
</tr>
</tbody>
</table>