Table 1. Diet composition for Grower-Finisher experiment 3 (As-fed basis).

	Treatment1																			
	Grower 1				Grower 2				Finisher 1				Finisher 2				Finisher 3			
Item	PC	EAA	NEAA	dEB	PC	EAA	NEAA	dEB	PC	EAA	NEAA	dEB	PC	EAA	NEAA	dEB	PC	EAA	NEAA	dEB
Corn	46.24	63.35	56.20	55.25	45.05	62.08	55.01	54.03	55.58	72.46	65.46	64.52	65.61	80.27	74.14	73.28	59.94	74.13	68.24	67.42
Soybean meal, 48% CP	28.00	11.15	11.15	11.15	19.75	3.00	3.00	3.00	16.60	0.00	0.00	0.00	14.60	0.10	0.10	0.10	25.05	11.05	11.05	11.05
Corn DDGS	20.00	20.00	20.00	20.00	30.00	30.00	30.00	30.00	22.50	22.50	22.50	22.50	14.85	14.90	14.90	14.90	10.00	10.00	10.00	10.00
Yellow grease	3.25	1.00	0.55	0.88	2.75	0.53	0.05	0.40	3.15	0.93	0.48	0.80	2.85	0.93	0.53	0.85	2.80	0.95	0.55	0.85
Monocalcium P	0.10	0.28	0.30	0.31		0.11	0.12	0.12		0.14	0.17	0.17	0.04	0.21	0.23	0.23		0.16	0.18	0.18
Limestone	1.24	1.30	1.29	1.29	1.25	1.35	1.35	1.35	1.20	1.28	1.27	1.27	1.10	1.15	1.15	1.15	1.04	1.09	1.08	1.08
NaCl	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Copper Sulfate	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10												
L-Lysine	0.205	0.728	0.744	0.746	0.222	0.743	0.759	0.761	0.189	0.705	0.721	0.723	0.163	0.613	0.626	0.628	0.182	0.616	0.629	0.631
DL-Methionine	0.043	0.195	0.213	0.216		0.152	0.171	0.173		0.150	0.169	0.171		0.131	0.147	0.149	0.050	0.177	0.192	0.194
L-Threonine	0.022	0.260	0.275	0.277		0.238	0.252	0.254		0.235	0.249	0.251		0.205	0.217	0.219	0.057	0.255	0.267	0.269
L-Tryptophan		0.093	0.096	0.097		0.093	0.096	0.096		0.091	0.095	0.095		0.080	0.083	0.083		0.077	0.080	0.080
L-Valine		0.289	0.310	0.313		0.288	0.308	0.311		0.285	0.306	0.308		0.248	0.265	0.268		0.240	0.257	0.259
L-Isoleucine		0.300	0.315	0.317		0.299	0.313	0.315		0.296	0.310	0.312		0.257	0.270	0.272		0.249	0.262	0.263
L-Histidine		0.156	0.168	0.170		0.155	0.167	0.168		0.153	0.165	0.167		0.133	0.144	0.145		0.129	0.139	0.140
Sodium bicarbonate				0.613				0.610				0.600				0.525				0.507
Glycine			2.495	2.495			2.480	2.480			2.445	2.445			2.140	2.140			2.065	2.065
L-Glutamic acid			4.990	4.990			4.960	4.960			4.890	4.890			4.280	4.280			4.130	4.130
Other2	0.31	0.31	0.31	0.31	0.38	0.38	0.38	0.38	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.39	0.39	0.39	0.39
Chemical composition																				
ME, kcal/kg	3451	3372	3096	3091	3435	3358	3083	3079	3465	3387	3117	3113	3454	3386	3149	3147	3443	3378	3149	3146
NE, kcal/kg	2535	2535	2535	2535	2529	2529	2529	2529	2595	2595	2595	2595	2619	2619	2619	2619	2573	2573	2573	2573
CP, %	22.66	17.24	22.66	22.59	21.40	16.01	21.40	21.33	18.54	13.20	18.51	18.45	16.17	11.51	16.15	16.10	19.48	14.97	19.46	19.40
SID Lysine, %	1.082	1.082	1.082	1.082	0.930	0.930	0.930	0.930	0.800	0.800	0.800	0.800	0.703	0.703	0.703	0.703	0.957	0.957	0.957	0.957
Total P, %	0.461	0.424	0.410	0.409	0.437	0.385	0.369	0.368	0.397	0.353	0.341	0.338	0.372	0.343	0.332	0.330	0.394	0.365	0.355	0.353
Avail. P, %	0.199	0.196	0.194	0.195	0.193	0.177	0.174	0.174	0.165	0.154	0.155	0.154	0.145	0.145	0.144	0.144	0.146	0.144	0.145	0.144
Avail. P with phytase, %	0.304	0.301	0.300	0.300	0.299	0.283	0.280	0.280	0.270	0.260	0.260	0.260	0.251	0.250	0.250	0.250	0.251	0.250	0.250	0.250
Ca, %	0.606	0.605	0.605	0.605	0.580	0.582	0.582	0.583	0.541	0.541	0.541	0.541	0.501	0.502	0.504	0.505	0.501	0.501	0.501	0.501
Na, %	0.290	0.280	0.279	0.444	0.313	0.303	0.302	0.466	0.290	0.281	0.279	0.441	0.268	0.259	0.258	0.400	0.260	0.252	0.251	0.388
dEB, mEq/kg	230	164	159	230	220	155	149	220	191	126	121	191	166	110	105	166	197	142	137	196
SID M+C:Lys	60	60	60	60	64	64	64	64	65	65	65	65	65	65	65	65	60	60	60	60
SID Thr:Lys	66	66	66	66	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68	68
SID Trp:Lys	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
SID Ile:Lys	75	75	75	75	78	78	78	78	78	78	78	78	77	77	77	77	73	73	73	73
SID Val:Lys	81	81	81	81	87	87	87	87	88	88	88	88	87	87	87	87	79	79	79	79
SID Leu:Lys	162	124	119	119	188	144	139	138	191	140	134	133	190	140	133	132	156	121	116	116
SID His:Lys	46	46	46	46	50	50	50	50	51	51	51	51	51	51	51	51	45	45	45	45
SID Arg:Lys	117	71	69	69	118	64	62	62	119	57	54	54	119	57	55	54	116	73	71	71
SID Phe:Lys	88	59	57	57	95	61	59	59	96	57	54	54	94	56	53	53	86	58	56	56
SID Phe+Tyr:Lys	152	104	101	100	167	111	108	107	164	110	106	105	163	100	96	95	145	100	97	97

[1]PC = positive Control, EAA = RCP + essential amino acids, NEAA = EAA + nonessential amino acids, and dEB = NEAA + Na_2CO_3.

[2]Others included Trace mineral premix, Vitamin premix, Phytase, Antioxidant, Antibiotic, and/or Ractopamine.

Table 2. Growth performance and carcass characteristics of Growing-Finishing pigs fed RCP diets supplemented with essential feed grade amino acids, non-essential amino acids and sodium bicarbonate.

Item	Treatment[1]				SEM	*P*-value
	PC	EAA	NEAA	dEB		
ADG, kg/d						
Phase 1	0.743	0.748	0.741	0.800	0.028	0.2245
Phase 2	0.929	0.948	0.930	0.874	0.028	0.2857
Phase 3	1.015	0.998	0.898	0.948	0.039	0.1699
Phase 4	0.845	0.811	0.864	0.866	0.045	0.7955
Phase 5	0.908	0.929	0.963	0.910	0.065	0.9064
Overall	0.888	0.884	0.879	0.877	0.016	0.9618
ADFI, kg/d						
Phase 1	1.292	1.301	1.363	1.397	0.056	0.1037
Phase 2	2.172	2.190	2.219	2.209	0.068	0.8158
Phase 3	2.647	2.725	2.661	2.637	0.051	0.5030
Phase 4	2.626	2.698	2.746	2.788	0.049	0.1463
Phase 5	2.689	2.712	2.712	2.626	0.102	0.9077
Overall	2.321	2.361	2.377	2.369	0.041	0.6622
G:F						
Phase 1	0.416	0.419	0.404	0.432	0.024	0.8512
Phase 2	0.323	0.328	0.327	0.313	0.017	0.8849
Phase 3	0.290	0.280	0.262	0.284	0.018	0.7131
Phase 4	0.240	0.225	0.244	0.243	0.016	0.8311
Phase 5	0.336	0.330	0.350	0.333	0.017	0.7079
Overall	0.306	0.299	0.302	0.305	0.014	0.9797
BW, kg						
Initial	20.91	21.06	20.91	20.99	1.38	0.3100
End of Phase 1	36.51	36.78	36.48	37.79	1.82	0.1788
End of Phase 2	61.60	62.39	61.59	61.40	2.28	0.8686
End of Phase 3	83.93^{x}	84.34^{x}	81.36^{y}	82.22^{xy}	2.31	0.0705
End of Phase 4	108.40	107.46	106.41	107.44	2.53	0.8392
End of Phase 5	131.86	131.60	130.76	130.57	2.32	0.9697
Carcass composition						
HCW, kg	96.89	95.76	95.92	94.68	1.74	0.8417
Dressing, %	73.32	72.89	72.94	72.79	0.35	0.6918
Fat free lean, %	54.58	54.32	55.04	54.93	0.32	0.3989
LD, mm^2	67.47	66.70	68.92	68.63	1.23	0.3886
BF, mm^2	17.31	18.26	16.99	18.04	0.75	0.6004

[1]PC = positive Control, EAA = RCP + essential amino acids, NEAA = EAA + non-essential amino acids, and dEB = NEAA + Na_2CO_3.

[2]FOM was equipped to measure loin depth and 10th rib fat depth, which together with HCW, was used to calculate fat free lean.

[xy]Means with superscript different significant differ ($P < 0.10$)