Table S1. Effect of dietary phytase and sex on average daily total phosphorus, available and calcium intake in growing pigs during the fattening period*

Dietary treatment	Con		Phy			*P* – Value[b]		
Item	Gilts	Barrows	Gilts	Barrows	SEM	Phytase	Sex	Phytase × Sex
Average daily total phosphorus intake, g/d								
Day 1-49	12.9	14.9	12.0	13.5	0.21	<0.001	0.009	0.327
Day 1-8	11.1	11.8	10.4	11.4	0.32	0.106	0.008	0.643
Day 9-22	12.1	14.1	11.1	12.9	0.25	<0.001	<0.001	0.760
Day 23-35	12.9	15.2	12.3	13.8	0.28	0.001	<0.001	0.185
Day 36-49	14.6	17.0	13.2	14.8	0.41	<0.001	0.016	0.407
Average daily available phosphorus intake, g/d								
Day 1-49	6.7	7.8	7.9	8.9	0.12	<0.001	<0.001	0.842
Day 1-8	5.8	6.2	6.9	7.5	0.20	<0.001	0.015	0.621
Day 9-22	6.3	7.3	7.4	8.6	0.15	<0.001	<0.001	0.731
Day 23-35	6.7	7.9	8.2	9.2	0.16	<0.001	<0.001	0.527
Day 36-49	7.6	8.9	8.7	9.7	0.25	<0.001	<0.001	0.741
Average daily calcium intake, g/d								
Day 1-49	17.0	19.6	16.1	18.1	0.27	<0.001	<0.001	0.359
Day 1-8	14.6	15.5	13.9	15.4	0.43	0.330	0.009	0.641
Day 9-22	15.9	18.6	14.9	17.4	0.33	0.001	<0.001	0.798
Day 23-35	16.9	20.1	16.5	18.6	0.37	0.015	<0.001	0.203
Day 36-49	19.2	22.4	17.7	19.8	0.55	<0.001	<0.001	0.431

[a]Con, control diet; Phy, phytase diet. Values are presented as least square means with the standard error of the mean.

[b]Fixed effect of time was significant ($P < 0.001$) for all parameters.

Table S2. Effect of dietary phytase and sex on serum parameters in growing pigs during the fattening period*

Dietary treatment			Con		Phy			*P* – Value[b]		
Item[c]	Time	SEM	Gilts	Barrows	Gilts	Barrows	SEM	Phytase	Sex	Phytase × Sex
Serum P, mmol/L										
Day 2	2.83^{y}	0.028	2.60	2.76	3.00	3.08	0.042	<0.001	0.006	0.305
Day 23	2.99^{x}	0.020	2.88	2.97	3.04	3.11	0.040	<0.001	0.044	0.749
Day 52	2.88^{y}	0.020	2.92	2.90	2.83	2.79	0.034	0.004	0.409	0.760
Serum Ca, mmol/L										
Day 2	2.63^{x}	0.014	2.71	2.71	2.57	2.56	0.022	<0.001	0.863	0.783
Day 23	2.64^{x}	0.010	2.66	2.64	2.60	2.66	0.024	0.521	0.460	0.139
Day 52	2.59^{y}	0.003	2.57^{ab}	2.60^{a}	2.59^{ab}	2.56^{a}	0.014	0.384	0.757	0.029
Serum Ca:P										
Day 2	0.94^{x}	0.009	1.05	0.99	0.86	0.83	0.015	<0.001	0.006	0.308
Day 23	0.89^{z}	0.006	0.93	0.89	0.86	0.86	0.010	<0.001	0.069	0.124
Day 52	0.91^{y}	0.006	0.89	0.90	0.92	0.92	0.011	0.020	0.270	0.614
Serum FGF23, pg/ml										
Day 2	1127^{x}	34.8	1245	1232	1074	1182	84.6	0.212	0.591	0.494
Day 23	990^{y}	30.3	988	1014	1028	1096	50.8	0.236	0.357	0.678
Day 52	902^{z}	30.1	813	836	919	872	52.0	0.165	0.823	0.492
Serum VitD, pg/ml										
Day 2	18.0^{x}	0.37	18.5	17.0	18.9	18.6	0.74	0.155	0.200	0.420
Day 23	15.5^{y}	0.27	15.5	15.6	15.6	15.6	0.44	0.907	0.884	0.996
Day 52	15.4^{y}	0.26	15.6	16.4	14.9	16.4	0.51	0.507	0.019	0.472
Serum ALP, U/L										
Day 2	209^{x}	3.5	200	206	195	194	9.1	0.346	0.786	0.703
Day 23	179^{y}	2.8	179	169	192	182	5.7	0.028	0.105	0.981
Day 52	157^{z}	2.9	151	155	168	157	5.4	0.070	0.491	0.160

Serum OCN, ng/ml										
Day 2	31.2^{y}	0.70	32.8	31.5	31.4	30.1	1.10	0.196	0.220	0.976
Day 23	33.0^{x}	0.47	32.5	32.0	34.6	33.1	0.88	0.070	0.265	0.562
Day 52	28.5^{z}	0.47	26.7	27.5	28.5	29.2	0.94	0.063	0.415	0.886
Serum urea, mg/dL										
Day 2	14.3^{z}	0.49	12.3	14.4	14.0	14.5	0.54	0.087	0.017	0.151
Day 23	18.7^{y}	0.35	16.3^{b}	21.9^{a}	17.2^{b}	20.3^{a}	0.63	0.596	<0.001	0.045
Day 52	22.8^{x}	0.36	18.3	24.8	21.0	25.6	0.81	0.033	<0.001	0.234
Serum cholesterol, mg/dL										
Day 2	85.5^{z}	1.09	87.9	91.7	84.8	85.4	2.11	0.025	0.291	0.437
Day 23	89.7^{y}	0.80	88.4	90.7	86.6	91.3	1.43	0.692	0.016	0.408
Day 52	97.6^{x}	0.82	96.8	100.0	98.0	99.7	1.66	0.805	0.142	0.645
Serum triglycerides, mg/dL										
Day 2	28.2^{x}	0.84	28.1	31.0	26.0	27.2	1.47	0.047	0.175	0.568
Day 23	25.3^{y}	0.59	25.6	24.3	24.3	25.8	1.09	0.950	0.935	0.195
Day 52	29.2^{x}	0.61	27.3	29.7	31.7	31.1	1.12	0.010	0.410	0.179
Serum NEFA, µmol/L										
Day 2	19.9^{y}	22.3	38.3	39.1	41.8	44.1	4.62	0.357	0.742	0.869
Day 23	30.4^{y}	17.93	43.6	42.1	52.7	44.0	8.24	0.472	0.509	0.636
Day 52	236.1^{x}	18.04	185.2	186.2	314.6	322.8	37.2	<0.001	0.895	0.916

[a]Con, control diet; Phy, phytase diet; Values are presented as least square means with the standard error of the mean.

[b]Fixed effect of time was significant ($P < 0.001$) for all parameters.

[c]P, phosphorus; Ca, calcium; Ca:P ratio, calcium:phosphorus ratio; FGF23, fibroblast growth factor 23; VitD, Vitamin D; ALP, alkaline phosphatase; OCN, osteocalcin; NEFA, non-esterified fatty acids

[a,b]Different superscript letters indicate significant differences for the interaction of phytase × sex ($P < 0.05$).

[x,y,z]Different superscript letters indicate significant differences between experimental days ($P < 0.05$).

Table S3. Pearson's correlation between calcium (Ca), total phosphorus (tP) and available phosphorus (aP) and serum parameters urea, cholesterol, triglyceride and non-esterified fatty acids in gilts and barrows*

		Gilts					Barrows				
Item	Week[b]	P intake, g/d	aP intake, g/d	Ca intake, g/d	Daily Ca:tP ratio	Daily Ca:aP ratio	P intake, g/d	aP intake, g/d	Ca intake, g/d	Daily Ca:tP ratio	Daily Ca:aP ratio
Serum urea, mg/dL	1	0.45*	0.55*	0.46*	0.31	-0.31	0.16	0.14	0.16	-0.02	0.02
	4	0.33	0.34	0.34	0.16	-0.16	0.31	0.16	0.31	-0.13	0.13
	8	0.37*	0.50*	0.38*	0.28	-0.28	0.59*	0.63*	0.60*	0.05	-0.05
Serum cholesterol,	1	0.27	0.17	0.27	-0.09	0.09	-0.07	-0.27	-0.09	-0.30	0.30
mg/dL	4	-0.09	-0.11	-0.09	-0.07	0.07	0.15	0.13	0.15	0.02	-0.02
	8	-0.58*	-0.47*	-0.58*	0.09	-0.09	-0.45*	-0.44*	-0.45*	0.04	-0.04
Serum triglyceride,	1	-0.16	-0.20	-0.16	-0.20	0.20	0.07	-0.11	0.05	-0.25	0.25
mg/dL	4	0.01	-0.04	0.00	-0.07	0.07	0.13	0.20	0.14	0.12	-0.12
	8	-0.40*	-0.19	-0.39*	0.27	-0.27	-0.36	-0.30	-0.36*	0.11	-0.11
Serum NEFA,	1	0.20	0.21	0.21	0.09	-0.09	-0.23*	-0.15	-0.23	0.10	-0.10
µmol/L	4	-0.11	0.00	-0.10	0.11	-0.11	-0.10	-0.08	-0.11	0.03	-0.03
	8	-0.65*	-0.45*	-0.64*	0.32	-0.32	-0.68*	-0.59*	-0.68*	0.34	-0.34

[a]P, phosphorus; aP, available phosphorus; Ca, calcium; daily Ca:tP ratio, daily calcium:total phosphorus ratio, daily Ca:aP ratio, daily calcium:available phosphorus ratio; NEFA, non-esterified fatty acids

[b]Week 1: Correlation between Ca, total P (tP) and available P (aP) intake from days 1-7 and serum parameters from days 2 and3 (in week 1). Week 4: Correlation between Ca, total P (tP) and available P (aP) intake from days 22-28 and serum parameters from 23 and 24 (in week 4). Week 8: Correlation between Ca, total P (tP) and available P (aP) intake from days 50-56 and serum parameters days from 52 and 53 (in week 8).

*$|r| > 0.35$ and $P < 0.05$.

Figure S1. Body weight gain (BWG, kg/d), feed intake (FI, kg/d) and gain:feed ratio of pigs grouped by sex (A) or by treatment group (B). [x,y]Different superscript letters indicate significant differences ($P < 0.05$) between sex (A) or dietary treatments.

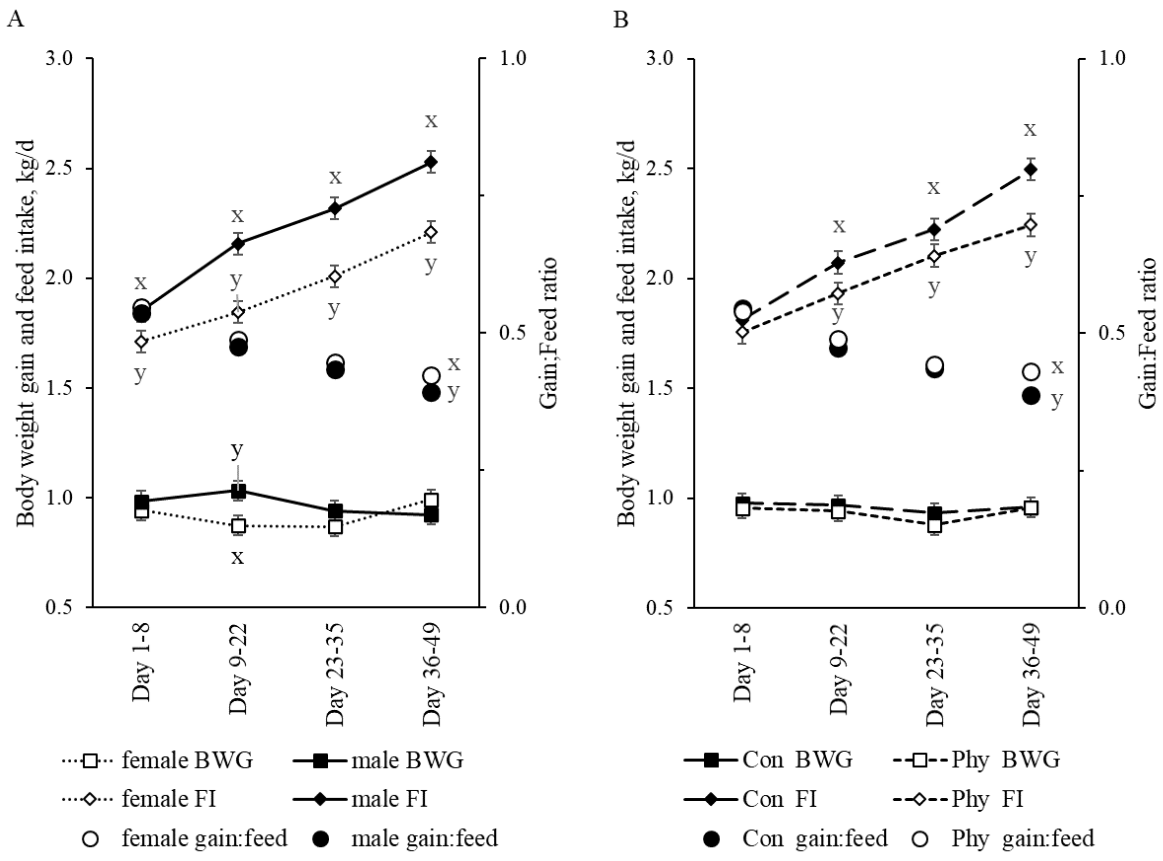
A
B
Body weight gain and feed intake, kg/d
Gain:Feed ratio
3.0
2.5
2.0
1.5
1.0
0.5
1.0
0.5
0.0
Day 1-8
Day 9-22
Day 23-35
Day 36-49
female BWG
male BWG
female FI
male FI
female gain:feed
male gain:feed
Con BWG
Phy BWG
Con FI
Phy FI
Con gain:feed
Phy gain:feed

Figure S1.