Effect of microbial phytase on ileal digestibility of minerals, plasma and urine metabolites, and bone mineral concentrations in growing-finishing pigs

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Supplementary materials

Table S1. Correlations between content of minerals in the chyme and their content in the blood, femur, faeces and urine.

Treatment [1]		NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]	NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]
		Grower						Finisher					
Chyme /blood	P	-0.467	0.612	-0.578	**-0.789**	**0.919**	**-0.987**	-0.515	**-0.934**	**0.982**	-0.688	0.571	**-1.000**
	Ca	0.099	**0.858**	0.126	0.538	**0.995**	-0.342	-0.668	**0.996**	-0.194	-0.051	-0.485	0.198
	Mg	-0.761	-0.237	**-0.990**	-0.020	-0.557	**-0.857**	-0.277	-0.069	-0.371	**0.945**	**-0.971**	0.511
	Cu	**0.918**	0.409	0.266	0.305	-0.713	**-0.903**	-0.742	-0.263	**-0.890**	0.092	-0.577	0.411
	Zn	0.256	0.507	**0.999**	**-0.986**	0.404	**0.983**	0.302	**-0.967**	-0.791	0.106	-0.170	0.062
	Fe	0.088	**0.855**	-0.445	**0.820**	-0.733	-0.579	-0.603	0.364	**0.959**	**0.984**	**0.978**	0.638
Chyme /	P	**-0.965**	0.265	0.488	-0.486	0.256	0.777	**0.961**	**0.946**	-0.416	0.695	-0.047	**0.968**

femur	Ca	-0.178	**0.965**	-0.236	**0.930**	0.001	0.230	0.170	**0.959**	-0.394	**0.878**	**-0.862**	**-0.897**
	Mg	-0.118	-0.888	-0.235	0.747	**-1.000**	0.407	0.771	0.808	0.090	**0.913**	**-0.983**	0.776
	Cu	**0.903**	**-1.000**	-0.657	**0.908**	-0.223	-0.794	0.589	**-0.892**	**0.982**	-0.033	-0.158	**-0.993**
	Zn	-0.191	0.560	0.274	**0.729**	**-0.963**	-0.420	**-0.876**	-0.604	0.699	-0.999	**-0.882**	**0.998**
	Fe	-0.668	0.320	-0.425	0.388	-0.507	-0.707	**1.000**	**-0.877**	-0.717	**0.993**	-0.272	**-0.891**
	P	0.386	0.247	-0.321	-0.109	0.587	0.175	0.056	**-0.918**	-0.288	**0.825**	**1.000**	-0.690
	Ca	-0.488	-0.059	0.663	-0.637	**0.956**	-0.394	**-0.848**	**0.762**	-0.587	**0.814**	**0.983**	**-0.843**
Chyme /	Mg	-0.352	-0.159	-0.677	0.680	0.174	-0.305	0.431	**0.995**	**0.955**	-0.420	-0.769	-0.087
faeces	Cu	0.760	**0.851**	0.026	0.325	0.266	0.057	**0.934**	0.149	-0.058	-0.139	**-0.942**	0.576
	Zn	0.038	0.606	**0.992**	**0.999**	-0.575	**0.814**	**-0.922**	**0.952**	-0.674	-0.373	**0.966**	-0.562
	Fe	0.441	**-0.847**	0.433	0.352	-0.615	**0.997**	-0.384	0.408	**0.957**	-0.174	-0.486	-0.232
	P	0.771	**0.995**	-0.078	-0.123	**0.951**	0.276	0.134	-0.153	0.384	0.439	**0.971**	**1.000**
	Ca	**0.962**	0.175	**-0.967**	**-0.801**	-0.777	**0.819**	-0.039	**1.000**	0.247	**-0.835**	**0.851**	**0.978**
Chyme / urine	Mg	0.732	0.282	**0.909**	0.387	0.637	**0.946**	0.863	**0.998**	-0.372	**0.999**	-0.729	**-0.999**
	Cu	**0.878**	-0.556	0.748	-0.479	-0.006	-0.444	-0.124	0.632	-0.366	-0.129	**-0.908**	-0.667

Zn	-0.503	**-0.999**	0.196	**0.862**	**0.998**	**0.940**	-0.529	-0.213	**0.990**	-0.139	-0.671	0.468
Fe	-0.246	**0.991**	**-1.000**	-0.069	0.315	**-0.876**	0.533	-0.266	**0.964**	**0.750**	0.367	0.055

Color-coded correlation matrix. Bold values indicate significant correlations ($P < 0.05$); [1] Diets 1–5 were P-deficient diets with 0 (NC), 250, 500, 1000, or 1500 phytase units FTU/kg, respectively. A sixth diet (positive control; PC) was formulated with increased dicalcium phosphate to meet the nutrient requirements of the pigs; [2] NC – negative control; [3] Phytase level added to NC; [4] PC – positive control.

Table S2. Correlations between content of minerals in the blood and their content in the femur, faeces and urine.

Treatment [1]		NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]	NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]
		grower						finisher					
	P	0.684	-0.601	0.430	-0.154	-0.145	-0.868	-0.733	**-0.999**	-0.236	**-1.000**	**-0.847**	**-0.971**
	Ca	**0.962**	**0.963**	**0.930**	0.811	0.106	**-0.993**	0.619	**0.928**	**0.978**	0.434	**0.862**	-0.611
Blood /	Mg	0.233	-0.742	**0.929**	0.649	0.564	0.025	**-0.825**	0.781	**0.891**	0.729	**0.998**	**0.939**
femur	Cu	0.658	-0.402	-0.236	-0.122	0.843	-0.891	**-0.979**	-0.201	**-0.789**	**-0.998**	**0.898**	-0.300
	Zn	**0.900**	-0.430	0.627	-0.833	-0.637	-0.496	-0.725	0.381	-0.115	-0.055	-0.316	0.126
	Fe	0.683	0.765	**0.984**	0.845	-0.215	**0.970**	-0.602	-0.767	**-0.885**	**0.956**	-0.468	**-0.918**
	P	0.741	0.147	-0.588	-0.525	**0.859**	-0.016	-0.885	0.715	-0.101	**-0.978**	0.596	0.700
	Ca	**0.987**	-0.500	**0.826**	**-0.992**	**0.920**	**0.998**	0.173	0.698	**0.908**	0.539	-0.313	-0.695
Blood /	Mg	0.220	**0.999**	**0.774**	0.719	**-0.914**	0.752	0.747	-0.167	-0.080	-0.694	**0.900**	**-0.901**
faeces	Cu	**0.990**	**0.999**	**0.971**	**-0.802**	**-0.866**	0.378	-0.454	**0.915**	-0.404	**-0.999**	**0.817**	**0.982**
	Zn	-0.614	0.711	**0.997**	**-0.976**	**-0.981**	**0.906**	0.091	**-0.999**	**0.985**	**-0.962**	0.091	0.790
	Fe	0.455	0.757	0.615	-0.247	**0.987**	-0.645	-0.504	-0.701	**0.835**	0.006	-0.292	**-0.897**

	P	**-0.923**	0.533	0.859	0.707	**0.996**	-0.119	**-0.918**	-0.210	0.551	**-0.954**	0.360	**-1.000**
	Ca	-0.178	0.656	-0.376	0.075	-0.707	0.258	0.769	**0.995**	**0.903**	-0.506	**-0.872**	0.397
Blood /	Mg	0.648	-0.800	-0.841	**-0.930**	0.284	-0.643	0.245	-0.010	**1.000**	**0.947**	**0.872**	-0.509
urine	Cu	0.617	**-0.986**	**0.839**	**-0.978**	0.706	0.786	-0.573	**-0.914**	0.750	**0.975**	**0.866**	**0.405**
	Zn	**-0.964**	-0.484	0.246	**-0.934**	0.347	**0.986**	0.649	0.455	-0.698	**0.970**	-0.617	**-0.853**
	Fe	**-0.987**	**0.917**	0.426	0.627	0.415	0.115	0.353	**-0.995**	**0.850**	**0.857**	0.554	0.804

Note: See in table S1.

Table S3. Correlations between content of minerals in the femur and their content in the faeces and urine.

Treatment [1]		NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]	NC [2]	250 [3]	500 [3]	1000 [3]	1500 [3]	PC [4]
		Grower						Finisher					
Femur /faeces	P	0.017	0.702	**-0.983**	**0.922**	-0.632	-0.483	0.332	-0.739	**0.990**	**0.979**	-0.078	**-0.850**
	Ca	**0.993**	-0.248	-0.844	-0.876	-0.293	**-0.985**	-0.667	**0.915**	**0.975**	**0.993**	-0.752	**0.994**
	Mg	**-0.897**	-0.720	-0.845	**0.995**	-0.181	**0.935**	-0.242	0.485	0.381	-0.013	**0.873**	-0.695
	Cu	0.543	-0.367	**0.925**	0.691	**-0.999**	**-0.999**	0.261	-0.580	-0.243	**0.994**	0.479	-0.475
	Zn	**-0.897**	0.329	**-0.999**	0.692	0.775	-0.344	0.620	-0.332	0.058	0.325	**-0.974**	-0.508
	Fe	0.961	0.158	-0.721	-0.726	-0.368	0.889	-0.386	0.080	0.132	-0.288	-0.709	0.648
Femur / urine	P	**-0.912**	0.356	0.832	-0.807	-0.054	-0.390	0.404	0.176	0.680	**0.951**	0.192	**0.975**
	Ca	-0.441	0.428	**0.987**	-0.523	0.629	-0.370	**0.978**	**0.961**	0.794	**-0.997**	**-0.999**	**-0.969**
	Mg	-0.590	0.191	**0.987**	-0.324	-0.632	0.638	0.344	0.616	**0.890**	**0.910**	**0.842**	-0.774
	Cu	**0.999**	0.550	-0.700	-0.088	**0.976**	**-0.953**	0.729	-0.214	-0.186	**-0.987**	0.557	0.751
	Zn	-0.752	-0.582	**0.937**	**0.975**	**-0.944**	0.806	0.053	-0.650	0.791	0.190	**0.942**	0.411
	Fe	-0.557	0.443	**0.936**	**0.946**	**-0.978**	-0.439	0.534	0.696	**-0.998**	0.667	**-0.995**	-0.503

Note: See in table S1.