# Effects of rapeseed meal fiber content on phosphorus and calcium digestibility in growing pigs fed diets without or with microbial phytase

# M. Bournazel, M. Lessire, M.J. Duclos, M. Magnin, N. Même, C. Peyronnet, E. Recoules, A. Quinsac, E. Labussière and A. Narcy

**Supplemental data**

**Table S1**. *Analyzed composition of rapeseed, rapeseed meal, dehulled rapeseed meal and hulls (as-fed basis)*

|  |  |
| --- | --- |
|  | Feedstuff |
|  | Rapeseed | Rapeseed meal | Dehulled rapeseed meal | Hulls |
| Components, % |  |  |  |  |
| DM | 92.2 | 85.1 | 85.8 | 85.5 |
| CP | 19.3 | 32.9 | 39.6 | 16.8 |
| Fat | 45.4 | 2.3 | 1.9 | 1.7 |
| CF | 7.0 | 13.0 | 6.5 | 21.5 |
| NDF | 18.2 | 27.7 | 14.6 | 59.0 |
| ADF | 10.9 | 17.7 | 8.2 | 47.9 |
| ADL | 5.4 | 8.5 | 2.0 | 26.7 |
| Total P | 0.60 | 0.92 | 1.24 | 0.20 |
| Ca | 0.35 | 0.58 | 0.40 | 1.05 |
| Phytate P | 0.41 | 0.50 | 0.78 | 0.11 |
| Glucosinolates\*, µmol/g | 13.1 | 11.3 | 21.0 | 1.9 |

\**Glucosinolates were determined by HPLC (ISO 9167–1:1992)*

**Table S2.** *Total and soluble phosphorus and calcium in the stomach and cecum of pigs fed experimental diets1 (dry matter basis)*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  | *P*-value2 |
| Description | wRSM | dRSM | dRSMh1 | dRSMh2 |  | Effect of microbial phytase | Effect of dRSM | Effect of hulls content |
| MP suppl.3 | - | + | - | + | - | + | - | + |  | 1,3,5,7 vs. 2,4,6,8 | 1 vs. 3 | 2 vs. 4 | 3 vs. 5 vs. 7 | 4 vs. 6 vs. 8 |
| Diets | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | SEM | Lin | Lin | Lin | Lin | Qua | Lin | Qua |
| Stomach |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Total, mg/g | 2.89 | 2.92 | 2.69 | 2.78 | 3.06 | 2.96 | 2.94 | 3.14 | 0.08 | 0.71 | 0.49 | 0.64 | 0.40 | 0.81 | 0.23 | 0.29 |
|  Soluble, mg/g | 0.29 | 0.52 | 0.23 | 0.52 | 0.28 | 0.59 | 0.28 | 0.57 | 0.03 | <0.001 | 0.46 | 1.00 | 0.50 | 0.69 | 0.57 | 0.86 |
|  Ca |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Total, mg/g | 2.74 | 3.87 | 2.19 | 3.20 | 2.61 | 3.89 | 2.74 | 4.02 | 0.15 | <0.001 | 0.23 | 0.15 | 0.24 | 0.40 | 0.079 | 0.23 |
|  Soluble, mg/g | 0.28 | 0.29 | 0.15 | 0.30 | 0.20 | 0.30 | 0.25 | 0.21 | 0.02 | 0.067 | 0.030 | 0.89 | 0.091 | 0.13 | 0.15 | 0.11 |
| Cecum |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  P |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Total, mg/g | 16.45 | 10.17 | 18.68 | 13.76 | 15.64 | 12.22 | 14.64 | 10.17 | 0.53 | <0.001 | 0.14 | 0.014 | 0.006 | 0.044 | 0.015 | 0.026 |
|  Soluble, mg/g | 0.42 | 0.17 | 0.37 | 0.26 | 0.40 | 0.24 | 0.49 | 0.27 | 0.02 | <0.001 | 0.38 | 0.075 | 0.025 | 0.024 | 0.88 | 0.67 |
|  Ca |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  Total, mg/g | 13.34 | 14.33 | 13.76 | 17.74 | 12.57 | 16.89 | 11.66 | 14.14 | 0.50 | 0.002 | 0.82 | 0.058 | 0.24 | 0.33 | 0.046 | 0.042 |
|  Soluble, mg/g | 0.16 | 0.17 | 0.13 | 0.23 | 0.13 | 0.17 | 0.15 | 0.16 | 0.01 | 0.006 | 0.25 | 0.038 | 0.46 | 0.48 | 0.013 | 0.071 |

*Lin= linear; Qua= quadratic.*

*1n = 6 pigs per diet*

*2Contrast analysis: linear effect of microbial phytase; linear effect of dehulled rapeseed seed without and with microbial phytase; linear and quadratic effects of the inclusion of hulls without and with microbial phytase.*

*3Microbial phytase supplementation: - = without microbial phytase and + = with 500 FTU/kg.*

**Figure S1:** Relation between stomach solubility of *i*P and bone density corresponding to area greater than 250 HU. y = 8.26 + 0.26 (δ – x) if x ≤ δ (δ = 16.68 % total P, asymptotic plateau of y = 8.26 cm², root mean square error (RMSE) = 0.98, R² = 0.39, *P* < 0.001, Akaike information criterion (AIC) = 135.9), n = 47.