Supplementary Table S1 Ingredient and analysed chemical composition of the experimental diets (DM basis)

|  |  |
| --- | --- |
|  | Diet |
|  | ALG−RS− | ALG+RS− | ALG−RS+ | ALG+RS+ |
| Ingredient composition (%) |  |  |  |  |
| Pregelatinized potato starch1 | 40.00 | 34.95 | 5.10 | − |
| Retrograded tapioca starch2 | − | − | 33.65 | 33.60 |
| Sodium alginate3 | − | 5.14 | − | 5.24 |
| Soybean meal | 35.00 | 34.95 | 35.73 | 35.67 |
| Wheat | 7.95 | 7.94 | 8.11 | 8.10 |
| Wheat middlings | 5.30 | 5.29 | 5.41 | 5.40 |
| Animal fat | 7.00 | 6.99 | 7.15 | 7.13 |
| Vitamin-mineral premix4 | 1.00 | 1.00 | 1.02 | 1.02 |
| Calcium carbonate | 1.25 | 1.25 | 1.28 | 1.27 |
| Monocalcium phosphate | 1.30 | 1.30 | 1.33 | 1.32 |
| Salt | 0.35 | 0.35 | 0.36 | 0.36 |
| L-Lysine·HCl | 0.15 | 0.15 | 0.15 | 0.15 |
| DL-Methionine | 0.20 | 0.20 | 0.20 | 0.20 |
| L-Threonine | 0.10 | 0.10 | 0.10 | 0.10 |
| Titanium dioxide | 0.25 | 0.25 | 0.26 | 0.25 |
| Flavour5 | 0.15 | 0.15 | 0.15 | 0.15 |
| Chemical composition (%) |  |  |  |  |
| DM (% as is) | 90.04 | 89.60 | 90.84 | 90.28 |
| Starch | 40.63 | 36.29 | 37.39 | 32.99 |
| Sugar | 4.29 | 4.17 | 5.53 | 5.56 |
| CP (N × 6.25) | 18.75 | 18.48 | 19.14 | 19.31 |
| Crude fat | 8.01 | 8.05 | 7.74 | 7.95 |
| Ash | 5.25 | 6.05 | 5.42 | 6.20 |
| ADF | 3.13 | 5.34 | 3.11 | 4.80 |
| ADL | 0.49 | 0.55 | 0.49 | 0.52 |
| DF6 | 13.12 | 16.56 | 15.62 | 18.27 |
| Titanium | 0.199 | 0.195 | 0.203 | 0.191 |
| Energy content (MJ/kg) |  |  |  |  |
| GE | 17.5 | 17.1 | 17.6 | 17.2 |

DM = dry matter; ALG = alginate; RS = resistant starch; ALG−RS− = control diet in the absence of ALG and RS; ALG+RS− = ALG diet in the absence of RS; ALG−RS+ = RS diet in the absence of ALG; ALG+RS+ = ALG diet in the presence of RS; DF = dietary fibre; GE = gross energy; MJ = megajoules.

1 PaselliTM WA4, Avebe Food, Veendam, The Netherlands.

2 C\*Actistar 11700, Cargill, Amsterdam, The Netherlands.

3 Pectacon M-5761, Acatris, Bunschoten, The Netherlands.

4 Provided per kilogram of diet: retinol, 6,000 IU; cholecalciferol, 1200 IU; DL-α-tocopherol, 40 mg; menadione, 1.5 mg; thiamin, 1 mg; riboflavin, 3 mg; D-pantothenic acid, 10 mg; niacin, 20 mg; cyanocobalamin, 15 μg; folic acid, 0.2 mg; pyridoxine hydrochloride, 1 mg; choline chloride, 150 mg; Fe as ferrous sulphate, 80 mg; Cu as copper sulphate, 15 mg; Zn as zinc sulphate, 50 mg; Mn as manganese oxide, 30 mg; Co as cobalt sulphate, 0.2 mg; I as potassium iodide, 0.7 mg; Se as sodium selenite, 0.2 mg.

5 Luctarom Advance Cherry Honey, Lucta S.A., Barcelona, Spain.

6 Content of dietary fibre (DF) calculated as DM − ash − CP − crude fat − starch − sugar content.

**Supplementary Material S1**

Chemical analyses

A diet sample was taken at the start of every batch for chemical analyses. For the analyses of dry matter (DM), ash, starch, sugar, crude protein (CP), crude fat, acid detergent fibre (ADF), acid detergent lignin (ADL), gross energy (GE), and titanium, diets were ground to pass a 1 mm sieve. DM and ash contents were determined by drying to a constant weight at 103 °C (ISO, 1999b) and combustion at 550 °C (ISO, 2002), respectively. CP (N × 6.25) was determined by the Kjeldahl-method (ISO, 2005) and crude fat by petroleum-ether extraction after acid hydrolysis (ISO, 1999a). Starch content was analysed enzymatically and additionally extracted with 40% ethanol to determine reducing sugars ([Brunt, 1993](#_ENREF_1)). ADF and ADL were analysed according to the Van Soest-method ([Van Soest, 1973](#_ENREF_6)). GE was determined using a bomb-calorimeter (Model IKA Calorimeter C7000, IKA Werke GmbH, Staufen, Germany) and titanium according to a standard method ([Short *et al.*, 1996](#_ENREF_5), [Myers *et al.*, 2004](#_ENREF_3)). All analyses were carried out in duplicate.

Blood plasma was analysed for glucose, insulin, and leptin. Plasma glucose concentrations were determined using an enzymatic method (Gluco-quant Glucose/HK, Roche/Hitachi Modular P800 Autoanalyzer, Roche Diagnostics GmbH, Mannheim, Germany) based on hexokinase activity ([Peterson and Young, 1968](#_ENREF_4)). For the glucose assay, the sensitivity was 0.11 mmol/L, and the intra- and interassay CV were 1.0 (*n* = 63) and 1.7% (*n* = 63), respectively. Plasma insulin concentrations were determined using a Porcine Insulin RIA kit (PI-12K, Millipore, St. Charles, MO). For the insulin assay, the sensitivity was 1.61 μU/mL, and intra- and interassay CV were 4.4 (*n* = 199) and 13.1% (*n* = 51), respectively. Plasma leptin concentrations were determined using a Multispecies Leptin RIA kit (KL-85K, Millipore, St. Charles, MO). For the leptin assay, the sensitivity was 0.80 ng/mL, and intra- and interassay CV were 3.2 (*n* = 16) and 7.8% (*n* = 4), respectively.

**Supplementary Material S2**

Feeding patterns

The electronic feeding station consisted of a feed dispenser, a feed trough connected to a load cell to measure the weight of the feed consumed, and a receiving device to identify radio signals from a transponder carried by the pigs. Each pig was fitted with an ear tag transponder with an unique electronic identification number, by which each visit to the feeding station, its duration, and the feed consumption per visit were recorded in the receiving equipment ([Hoy *et al.*, 2012](#_ENREF_2)). Access to the feeding station was restricted to 1 pig at a time, and a maximum of 1,800 g of feed was available for consumption per visit. After each feeding, the feeding station was closed and the feed trough was lifted to enable automatic weighing (with ± 3 g accuracy) of the amount of feed consumed. When less than 1,000 g of feed was left in the feed trough, it was automatically refilled to 1,800 g. After 30 s, which included the weighing and refilling, the next pig could access the feeding station. Pigs had 24-h access to the feeding station. All data was continuously stored in a data file with the pen number, the pig’s identification number, the date, the time of entry and exit per visit, and amount of feed consumed per visit. Data on feed intake characteristics for individual pigs were accumulated over the 12-week period of each batch, and were used to estimate mean values for feeding pattern variables per pig per day. All scales of the electronic feeding stations were calibrated at the start of each batch and thereafter only in case of malfunction, using a 2-kg test weight.

References

Brunt K 1993. Enzymatic determination of starch content in feed and feedstuffs. Memo 93-302 (in Dutch). In Stichting Nederlands Instituut voor Koolhydraat Onderzoek, Groningen, The Netherlands.

Hoy S, Schamun S and Weirich C 2012. Investigations on feed intake and social behaviour of fattening pigs fed at an electronic feeding station. Applied Animal Behaviour Science 139, 58-64.

ISO. 1999a. Animal feeding stuffs - Determination of fat content (ISO 6492). International Organization for Standardization, Geneva, Switzerland.

ISO. 1999b. Animal feeding stuffs - Determination of moisture and other volatile matter content (ISO 6496). International Organization for Standardization, Geneva, Switzerland.

ISO. 2002. Animal feeding stuffs - Determination of crude ash (ISO 5984). International Organization for Standardization, Geneva, Switzerland.

ISO. 2005. Animal feeding stuffs - Determination of nitrogen content and calculation of crude protein content - Part 1: Kjeldahl method (ISO 5983-1). International Organization for Standardization, Geneva, Switzerland.

Myers WD, Ludden PA, Nayigihugu V and Hess BW 2004. Technical note: a procedure for the preparation and quantitative analysis of samples for titanium dioxide. Journal of Animal Science 82, 179-183.

Peterson JI and Young DS 1968. Evaluation of the hexokinase/glucose-6-phosphate dehydrogenase method of determination of glucose in urine. Analytical Biochemistry 23, 301-316.

Short FJ, Gorton P, Wiseman J and Boorman KN 1996. Determination of titanium dioxide added as an inert marker in chicken digestibility studies. Animal Feed Science and Technology 59, 215-221.

Van Soest P 1973. Collaborative study of acid-detergent fibre and lignin. Journal of AOAC International 56: 781–784.