

diet. During the starter phase (12-28 days of trial) and over the whole experimental period, all treatments that were offered access to a diet with saccharin (T-2 to T-6) showed numerically lower values for total feed intake and growth than the double control treatment (T-1). It is concluded that the addition of saccharin at doses up to 2000 ppm did not improve feed preference or weanling pig performance.

**Key Words:** piglet, feed intake, saccharin

**206 Interaction between the palatabilities of cereal and protein source in diets for pigs.** D Solà-Oriol<sup>1</sup>, E Roura<sup>\*2</sup>, and D Torrallardona<sup>1</sup>, <sup>1</sup>IRTA, Mas de Bover, Constantí, Spain, <sup>2</sup>Lluçà SA, Barcelona, Spain.

Differences in feed palatability due to individual ingredients have been reported for pigs. However, little is known about the interactions between ingredients. To study the interaction between cereal (C) and protein source (P) on feed preference, a series of double choice preference trials were conducted with a common reference diet (REF). A total of 24 diets was tested: 4 cereals (barley or oats at 30 or 60%), 4 proteins (lupine or rapeseed at 10 or 20%) and 16 diets consisting of all possible cereal-protein combinations. A double control (REF vs. REF) was used. Preference was calculated as the percentage contribution of the tested diet to total feed intake. Additionally, hardness, fragility, chewing effort and stickiness of the diets were also measured with a texture analyzer. For each of the 16 combinations, the interaction between C and P was studied, using the values of the four corresponding diets (REF, cereal, protein and cereal-protein). A 2x2 factorial arrangement of treatments was used, taking C and P as main factors. Pearson's correlation coefficients between the preference of each diet and its texture parameters were obtained. The GLM and CORR procedures of the statistical package SAS were used. C and P affected (P<0.05) preference for most combinations. Interactions were observed (P<0.05) between cereals and protein sources, indicating that lupine, combined with either barley or oats, reduces palatability to a larger extent than when tested by itself (11.8, 5.0 vs. 58.4% preference; SEM=3.06) and that the independent effects of oats and rapeseed (6.9, 13.1 %; SEM=1.61) are not additive when presented in combination (5.2%; SEM= 3.06). Similarly significant (P<0.05) effects of C, P and C×P were observed on the texture parameters for most combinations. Significant (P<0.05) Pearson's correlation coefficients between preference and hardness, fragility and chewing effort were observed (r = -0.51, -0.52 and -0.62, respectively). In conclusion, the effects of cereal and protein source on the palatability and texture of a diet for pigs are not independent. The texture characteristics of the diets partially explain their palatability.

**Key Words:** piglet, palatability, texture

**207 The effects of frequent out-of-feed events on growth performance of nursery, grower, and finisher pigs.** S. K. Linneen\*, S. S. Dritz, R. D. Goodband, M. D. Tokach, J. M. DeRouchey, and J. L. Nelssen, *Kansas State University, Manhattan.*

Two experiments were conducted to determine the effects of out-of-feed events on nursery and finishing pig performance. In Exp. 1, 190

pigs (initially 6.35 kg) were used in a 35-d trial (8 replications with 6 pigs/pen). Treatments included a 20-h (12:00 noon to 8:00 am) feed withdrawal for 1, 2, or 3 randomly selected days or a control treatment in which feeders were never withdrawn. Feeders were withdrawn on d 11, d 8 and 23, or d 9, 14, and 20 for pigs with 1, 2, or 3 out-of-feed events, respectively. During each week in which pigs experienced an out-of-feed event, ADG decreased (P < 0.06) compared to control pigs. From d 7 to 14 and d 14 to 21, ADFI decreased (P < 0.07) for pigs with out-of feed events, compared with control pigs. If the out-of-feed event occurred early in the week, pig growth performance was usually intermediate to that of control pigs and the pigs with an out-of-feed event later in the week. In the following week, however, pigs that had an out-of-feed event in the previous week had improved ADG and G/F compared with pigs that did not have an out of feed event. Overall, there were no differences in ADG (492, 487, 495, 488 g/d; P < 0.94) or G:F (0.733, 0.727, 0.736, 0.735; P < 0.86) among pigs with none, 1, 2, or 3 out-of-feed events. In Exp. 2, 479 pigs (initially 41.6 kg) were used in an 85-d trial in a commercial finishing barn (8 replications with 19 or 20 pigs/pen). Treatments included a control treatment in which pigs had access to feed for the entire trial, feed withdrawal (20 h; 12:00 noon to 8:00 am) one day per week for the entire trial, or one day per week from d 45 to 85 (market wt). Feed withdrawal occurred on a randomly selected day, with the exception of Saturday, Sunday, or a day before weighing. There were no differences (P > 0.12) in growth performance throughout the trial. In conclusion, results suggest that out-of-feed events (20 h or less per week) will have no long term effects on growth performance in nursery or growing-finishing pigs.

**Key Words:** pigs, feed management, feed availability

**208 The effect of two versus six meals per day on performance of developing pigs being restricted in feed intake.** J. D. Schneider\*, M. D. Tokach, S. S. Dritz, R. D. Goodband, J. L. Nelssen, and J. M. DeRouchey, *Kansas State University, Manhattan.*

Three trials (Exp 1 and 2 = 42 d; Exp 3 = 28 d) were conducted to evaluate the effects of feeding frequency on the performance of restrict-fed growing pigs (initially 67 kg in Exp. 1, and 71 kg in Exp. 2 and 3). In all experiments, pigs were housed in 1.8 × 3.1 m pens with half-solid cement and half-slatted flooring that contained one nipple waterer. Pigs were fed a corn-soybean meal based diet formulated to 1.15% TID lysine and 3,294 kcal of ME/kg. Energy and lysine were supplied to pigs to target an average growth rate of 794 g/day based on NRC (1998) values. Pigs were fed by dropping similar daily amounts of feed, either 2 (07:00 or 14:00) or 6 times (3 meals within 2 h at AM and PM feedings) per day, by an Accu-Drop Feed Dispenser® (AP Systems, Assumption, IL) on the solid cement flooring. Data from all experiments were analyzed as a complete randomized design using the MIXED procedure of SAS. In Exp. 1, there was an increase (p < 0.01) in ADG (683 vs. 606 g/d) and G/F (0.41 vs. 0.36) for pigs fed similar amounts of feed 6 times per day compared with pigs fed 2 times per day. In Exp. 2, increasing the feeding frequency of pigs fed a restricted diet from 2 to 6 times per day improved (P < 0.02) ADG (623 vs. 504 g/d) and G/F (0.36 vs. 0.29). In Exp. 3, the additional treatment was designed to minimize feed wastage by dropping feed closer to the floor in pigs fed 2 times per day. The goal was to determine whether the improvements in performance were due to improved efficiency or decreased feed wastage. Pigs fed 6 times per day had improved (P < 0.05) ADG (608, 518, 509 g/d for 6 times, 2 times, and 2 times modified, respectively) and G/F (0.37, 0.31, and 0.31) compared to