

effects of increasing oregano oil on growth performance of weanling pigs. Oregano oil is an extract derived from the Greek oregano herb, *Origanum vulgare*. The oregano oil (5%) is mixed with an inert carrier (95%) to make a premix that is added to the diet. There were seven pigs per pen and six pens per treatment. Pens consisted of four barrows and three gilts or three barrows and four gilts. Pigs were blocked by weight and randomly allotted to one of five dietary treatments. Dietary treatments were: a negative control diet (without an antibiotic or oregano oil); a positive control diet containing neomycin/oxytetracycline (NT; 154 ppm); and the negative control diet plus oregano oil premix at 0.05, 0.10, or 0.20% of the diet. Oregano oil concentration remained constant for the 28-d trial. From d 0 to 14, ADG, ADFI, and G:F improved ($P < 0.01$) for pigs fed NT compared with those fed oregano oil or the control diet. From d 0 to 28, ADG and ADFI increased ($P < 0.006$) in pigs fed NT whereas G:F was not improved ($P = 0.35$) compared with pigs fed the negative control diet (see table). Pigs fed oregano oil had similar ($P > 0.15$) ADG, ADFI, and G:F compared with pigs fed the negative control diet. Pigs fed NT had increased ($P < 0.04$) ADG, ADFI, and G:F compared with pigs fed any level of oregano oil. In conclusion, NT improved growth performance of weanling pigs; whereas, oregano oil did not influence pig performance.

Table 1. Effects of increasing oregano oil in nursery pig diets

| D 0 to 28 | Negative Control | Positive Control | Oregano oil, % | | | SE |
|-----------|--------------------|-------------------|--------------------|-------------------|-------------------|--------|
| | | | 0.05 | 0.10 | 0.20 | |
| ADG, g | 357 ^b | 418 ^a | 356 ^b | 354 ^b | 358 ^b | 17.289 |
| ADFI, g | 450 ^b | 520 ^a | 455 ^b | 459 ^b | 461 ^b | 23.138 |
| G:F | 0.79 ^{ab} | 0.81 ^a | 0.78 ^{ab} | 0.77 ^b | 0.78 ^b | 0.013 |

^{ab} Means in the same row without common superscript differ ($P < 0.05$).

Key Words: Antimicrobial, Nursery pigs, Oregano

71 Effect of whey protein concentrate source on growth performance of nursery pigs. R. O. Gottlob*, J. M. DeRouche, M. D. Tokach, R. D. Goodband, S. S. Dritz, J. L. Nelssen, C. R. Neill, and C. W. Hastad, *Kansas State University, Manhattan*.

A total of 228 weanling pigs (6.8 kg and 21 d of age) were used to evaluate the effects of whey protein concentrate (WPC) source on growth performance. Pigs were blocked by BW and sex and allotted to one of seven diets in an unbalanced complete block design. There were five or six pigs per pen (equalized within block) with five pens for each control and six pens for each WPC treatment. The seven treatments included a negative control with no WPC, a positive control with 5% spray-dried animal plasma (SDAP), or the negative control diet with WPC from one of five sources. Sources of WPC varied in CP from 57.6 to 80.2% and replaced SDAP on a lysine basis. Pigs were fed experimental diets from d 0 to 14 and a common diet from d 14 to 28. For d 0 to 14, ADG was 206, 242, 248, 225, 206, 237, and 235 g/d and G:F was 0.71, 0.79, 0.84, 0.80, 0.80, 0.83, and 0.84 for pigs fed the negative and positive control and WPC sources 1 to 5, respectively. Pigs fed WPC had improved ($P < 0.01$) G:F compared to pigs fed the control diet, but tended to have

decreased ($P < 0.09$) ADFI compared to pigs fed diets containing SDAP. Pigs fed diets containing Source 1 WPC had greater ADG ($P < 0.05$) than pigs fed the control diet or diets containing Source 3 WPC, while pigs fed other diets were intermediate. Pigs fed diets containing SDAP had greater ADFI ($P < 0.05$) than pigs fed diets containing Source 3 WPC, while pigs fed other diets were intermediate. Pigs fed diets containing Source 1, 4, or 5 WPC had improved G:F ($P < 0.05$) compared to pigs fed the control diet. From d 0 to 28, pigs fed diets containing Source 1 WPC had greater ADG ($P < 0.05$) than pigs fed diets containing Source 3 WPC. There were no differences in overall ADFI and G:F and no differences in overall performance between pigs fed WPC and SDAP. The difference in growth performance of pigs fed WPC confirms our previous results in that variation between WPC sources exists. Pigs fed diets containing high quality WPC can have similar performance to those fed SDAP.

Key Words: Nursery pigs, Plasma, Whey protein concentrate

72 Evaluation of regional differences in nutrient composition and physical characteristics among six U.S. soybean meal sources.

P. E. Urriola*¹, M. H. Whitney², N. S. Muley¹, and G. S. Shurson¹, ¹*University of Minnesota, St Paul*, ²*Extension Regional Center, Mankato, MN*.

A total of 86 soybean meal (SBM) samples were collected monthly from July 2003 to December 2004 from 6 soybean processing plants (SPP) located in two regions (R): North Carolina (n = 13), South Carolina (n = 13), and Alabama (n = 12) in the southern region (SR), and two Minnesota (n = 14, respectively) and one South Dakota SPP (n = 20) in the northern region (NR). Subsamples were sent to Iowa Testing Laboratory (Eagle Grove, IA) for proximate and mineral analysis, and to the University of Missouri for amino acid analysis. Additional subsamples were analyzed for bulk density and particle size. All nutrient values were expressed on a DM (%) basis. Crude protein (55.23 ± 0.14) and ash (7.02 ± 0.05) content were influenced ($P = 0.004$) by year, R, and SPP. However, crude fat (1.68 ± 0.05) was affected only by SPP ($P = 0.0001$), while crude fiber (3.77 ± 0.03) was affected only by year ($P = 0.01$). Samples from SR were higher ($P = 0.05$) in lys (3.45 ± 0.02), met (0.77 ± 0.01), thr (2.08 ± 0.01), and trp (0.76 ± 0.01) than NR (3.38 ± 0.01 , 0.74 ± 0.01 , 2.00 ± 0.01 , and 0.73 ± 0.01 , respectively). Crude protein of SBM was poorly correlated with essential amino acid content ($r^2 = 0.52$). Total amino acid content and total non-essential amino acids were higher ($P = 0.001$) for SR compared to NR. Concentrations of P, K and Mn were higher ($P = 0.001$) in samples from SR than NR. However, Ca, Mg, Na, S and Zn content was similar ($P = 0.035$) between R. Average particle size (μm) was higher ($P = 0.001$) in NR (851 ± 33) compared to SR (731 ± 31). Bulk density (kg/m^3) was similar ($P = 0.41$) between R (532 ± 3). Mean particle size and bulk density values were different ($P = 0.002$) between SPP. Although there were significant differences in nutrient content and physical characteristics of soybean meal samples among regions, year, and SPP, these differences were small and of minimal consequence when formulating practical animal diets.

Key Words: Soybean meal, Nutrient composition, Physical characteristics