**T234 Effects of different dietary sources of n-3 PUFA on reproductive performance of laying hens.** M. Pilevar[1], J. Arshami[1], A. Heravi Moussavi[1], A. Golian*[1], M. R. Basami[1], and A. R. Rezaee[2], [1]*Ferdowsi University of Mashhad*, *Khorasan Razavi, Iran*, [2]*Mashhad University of Medical Sciences*, *Khorasan Razavi, Iran*.

This study was conducted to evaluate the effects of n-3 polyunsaturated fatty acids (PUFAs) on reproductive performance in hy-Line W-36 pullet chicks at the onset of laying period. Two hundred eighty-eight 1-day-old pullet chicks with initial BW of 40.73 g were used in a CRD design to a 2 × 2 factorial arrangement. The main effects were 2 sources of n-3 (flaxseed or fish oil) and 2 levels of n-3 (1.5% and 0.5%) in the diet. The concentration of n-6 PUFA was kept constantly (3% of diet) by soybean oil in all experimental phases. During the 5 experimental phases (starter, grower, developer, pre-developer and pre-peak), feed and water were provided ad libitum. Each dietary treatment (fish1.5, fish0.5, flax1.5 and flax0.5) was assigned to 6 replicate cages with 12 newly hatched pullet chicks per cage. The chicks were raised in cages under optimum environmental conditions until 22 wk as recommended by the Hy-line commercial management guide (2007). On wk 15 of experiment, pullets were transferred to the laying house and individually placed in standard laying cages to determine the day of sexual maturity (first oviposition). All birds were photostimulated at 18 wk of ages. The weight of first egg at sexual maturity and 22 wk egg production were numerically decreased in birds fed diet fish1.5 ($P > 0.05$). However, egg production was affected by the sources ($P = 0.005$) and levels of n-3 ($P = 0.003$) of the diet at 21 wk. At the end of wk 18, no significant differences were observed in the BW and FI between sources and levels of n-3 PUFA ($P > 0.05$). In this study, time of sexual maturity was negatively affected by the sources ($P = 0.029$) and interaction between main effects ($P = 0.03$). Laying hens fed fish oil came into oviposition later, after photostimulation according to this: fish1.5; 20d, fish0.05; 14d, flax1.5; 11d and flax0.5; 14d. Our results show that high levels of fish oil delay the time of first oviposition compared with flaxseed.

**Key Words:** n-3 PUFA, first oviposition, laying hen

**T235 Docosahexaenoic acid does not increase insulin sensitivity in gilts.** J. H. Eisemann*, S. Whisnant, and J. Odle, *North Carolina State University*, *Raleigh*.

Dietary fish oil increased insulin sensitivity in several species including miniature pigs. Fish oil is rich in eicosapentaenoic acid (EPA, 20:5, n-3) and docosahexaenoic acid (DHA, 22:6, n-3). The objective was to measure insulin sensitivity in gilts consuming diets containing added DHA. Gilts were fed diets formulated to contain 0% DHA (Control, Cont; n = 5) or 0.54% added DHA provided by DHAgold (Martek Biosciences Corp., Columbia, MD; n = 7). Inclusion of DHAgold also provided 0.23% added docosapentaenoic acid (DPA, 22:5, n-6). Diets were fed for 6 wks before measurement of insulin sensitivity. Body weight at the time of sampling was 110.0 kg (SEM 7.3 kg) for gilts fed Cont and 111.4 kg (SEM = 6.0 kg) for gilts fed DHA. An i.v. glucose tolerance test (IVGTT; 1.25 g glucose/kg BW $^{0.75}$) and an i.v. insulin tolerance test (IVITT; 0.30 IU insulin/kg BW $^{0.75}$) were conducted on successive days. Blood samples were taken from indwelling jugular catheters at 30, 15, and 5 min before and 2.5, 5, 10, 15, 20, 30, 40, 50, 60, 75, and 90 min after infusion to measure concentrations of Gluc and Ins (IVGTT) or Gluc only (IVITT). Basal concentrations of Gluc and Ins did not differ between diets and were 5.06 and 4.82 mM Gluc; and 12.6 and 9.2 uIU/mL Ins for Cont gilts and DHA gilts, respectively. The area under the response curve (AUC) for Gluc response to the Gluc infusion (mM Gluc x 30 min) tended to be greater ($P < 0.07$) in gilts fed DHA (113.9) compared with Cont gilts (94.0). There was a tendency ($P = 0.10$) for greater Gluc half-life (min) in gilts fed DHA (9.96) than gilts fed Cont (8.52). The AUC for Ins response to the Gluc infusion and the AUC for Gluc response to the Ins infusion did not differ for the 2 groups and were 1002 and 1266 (uIU insulin/mL x 30 min) for Cont and DHA gilts, respectively, and 182 and 170 (mM Gluc x 90 min) for Cont and DHA gilts, respectively. Lack of response suggests that fish oil may not increase Ins sensitivity in these pigs, the response observed due to feeding fish oil is due to EPA rather than DHA, or the presence of DPA diminished the response.

**Key Words:** DHA, fatty acid, insulin sensitivity

**T236 Conjugated linoleic acid (CLA) modifies carcass traits and fatty acid composition in finishing pigs fed with high linoleic acid diets.** G. Cordero[1,2], B. Isabel[2], J. G. Vicente[2], J. Morales[1], C. Piñeiro*[1], and C. J. López-Bote[2], [1]*PigCHAMP Pro Europa*, *Segovia, Spain*, [2]*Universidad Complutense de Madrid*, *Spain*.

Conjugated linoleic acid (CLA) in swine nutrition has the potential to improve feed efficiency and decrease carcass fat. Moreover, it may also alter fatty acid synthesis and metabolism, thus leading to more saturated fat. Therefore, CLA supplementation in finishing pigs might ameliorate the deleterious effect that a high concentration of polyunsaturated fatty acids (PUFA), particularly linoleic acid (LA), produces on carcass and meat consistency. The objectives of this experiment were to study the effect of a commercial source of CLA (60% of CLA isomers, 30% c9,t11 and 30% t10,c12) supplied with 2 high levels of LA on performance, carcass traits and fatty acid composition of subcutaneous fat. Therefore, there were 4 treatments arranged factorially with 2 CLA dietary contents (0 vs 1%) and 2 LA dietary levels (1.45 vs. 1.17). For the experiment, 40 pigs Large White × (Large White × Landrace) with 129.4 (±4.83) kg live weight were used. Either supplementation with CLA or LA did not affect average daily gain (ADG), average daily feed intake (ADFI) and feed efficiency. Carcass, ham and foreleg weights were recorded, but were not affected by CLA supplementation. The highest level of LA tended ($P = 0.05$) to increase the foreleg weight. No effect of LA was observed on backfat thickness, but a trend ($P = 0.09$) to reduce backfat thickness was shown when pigs received a diet containing CLA. No difference in intramuscular fat content was observed among treatments. A marked effect of CLA administration was observed in most fatty acids, with an increase in the concentration of saturated fatty acids and a decrease in the concentration of total monounsaturated fatty acids, but not effect on PUFA concentration was observed. The highest level of LA increased the concentration of C18:2 n-6, C18:3 n-3, C20:3 n-9 and total PUFA ($P < 0.01$). We conclude that 1% of CLA supplementation enhance fatty acid saturation, which may help to overcome problems of oil and low consistency meat.

**Key Words:** conjugated linoleic acid, linoleic acid, finishing pigs

**T237 Effects of high oil poultry by-product meal in laying hen performance, egg quality, egg components and blood parameters.** G. O. Majid*, J. Hossein, T. Akbar, and R. Abass, *University of Tabriz*, *Tabriz, Iran*.

Poultry by-product meal (PBPM) is usually composed of the wastage from poultry meat processing. To examine the effects of high oil PBPM

from Iran on laying hen performance, egg quality, egg components and blood parameters, 160 HyLine W-36 hens at the age of 42 wk housed in laying cages with 4 hens per cage. The trial was conducted using the completely randomized design with 5 experimental diets as treatments and 4 replications for each treatment. Five experimental diets were prepared with inclusion of 0%, 2%, 4%, 6% and 8% PBPM and all diets were isocaloric and isonitrogenous. Egg weight and egg production was recorded daily. Feed intake was recorded every 2 weeks. The egg mass and feed conversion ratio (FCR) was calculated according to the HyLine W-36 2003–2005 commercial management guide. Three eggs from each treatment replicate were randomly collected for measuring egg shape index, Haugh units, shell thickness and egg yolk, shell and albumen weight. Finally for determining blood parameters such as serum glucose, triglyceride, calcium, phosphorous, low-density lipoprotein (LDL) and high-density lipoprotein (HDL), 2 hens from each treatment replicate were randomly selected and were determined by using commercial kits. The results showed that egg weight, egg production, egg mass and feed intake was significantly decreased and FCR was significantly increased by increasing level of PBPM in diets ($P < 0.05$). Egg shape index, shell thickness, albumen weight and all blood parameters were unaffected by different levels of PBPM in diets ($P < 0.05$). Increasing level of PBPM in diets significantly decreased Yolk weight and shell thickness ($P < 0.05$). Results indicated that up to 2% PBPM can be used in laying diets with no negative effects in laying performance and egg quality.

**Key Words:** laying hen, egg quality, high oil poultry by-product meal