

## C-064

**Effect of dietary starch concentration and fish oil supplementation on fatty acid profile and microbial composition of rumen fluid in lactating dairy cows**

Sara Minieri<sup>1</sup>, Carlo Viti<sup>1</sup>, Stefania Colombini<sup>2</sup>, Arianna Buccioni<sup>1</sup>, Giuseppe Conte<sup>3</sup>, Luca Rapetti<sup>2</sup>, Luca Malagutti<sup>2</sup>, Stefano Rapaccini<sup>1</sup>, Marcello Mele<sup>3</sup>

<sup>1</sup>Dipartimento delle Produzioni Agro-alimentari e dell'Ambiente, Università degli Studi di Firenze, Italy

<sup>2</sup>Dipartimento di Scienze Agrarie ed Ambientali, Produzione, Territorio, Agroenergia, Università degli Studi di Milano, Italy

<sup>3</sup>Dipartimento di Scienze Agrarie, Alimentari e Agro-ambientali, Università degli Studi di Pisa, Italy

Corresponding author: sara.minieri@unifi.it

The aim of this study was to evaluate the effects of diets with different starch concentration and fish oil (FO) supplementation on fatty acid (FA) profile and changes in microbial population of rumen liquor in lactating dairy cows. The experiment was conducted as 4 X 4 Latin square design with a 2 x 2 factorial arrangement: i) 2 concentration of dietary starch (low vs. high: 23.7 and 27.7% on DM basis); ii) the presence or absence of FO (0.80% on a DM basis); and their interaction has been evaluated. Four Italian Friesian cows, in 4 consecutive 26-d period, were fed the following diets: i) low starch (LS); ii) low starch plus FO (LSFO); iii) high starch (HS); iv) high starch plus FO (HSFO). At the end of each experimental period the rumen liquor was sampled and analyzed for FA profile and microbial composition. The percentages of C16:1 cis9 (P=0,0483), C18:1 trans6-8 (P=0,0060), C18:1 trans11 (P=0,0219) and C22:6 n-3 (P=0,0183) were significantly increased in the rumen liquor by the FO supplementation while the total saturated FA percentage decreased. *Butyrivibrio fibrisolvens*, *Prevotella* spp. (involved in the biohydrogenation pathway (BH) of polyunsaturated FA), *Ruminococcus albus*, *Ruminobacter flavefaciens* and total protozoa content were not affected neither by starch level neither by FO inclusion in the diets. In contrast *Streptococcus bovis*, a pectin fermenting species, increased with LS diets (P=0,0491), according to a higher content of neutral detergent fiber and a lower starch content of the diets. At the dosage tested, FO did not induce perturbation in the rumen microbial community, but improved the concentration of several functional FA (C18:1 trans11 and C22:6 n-3) without promoting the shift of the BH toward the C18:1 trans10 production, as previously reported.

## C-065

**Effects of using an oregano aqueous extract on performance, gut microbiota and immune function in broiler chickens**

Maria Pia Franciosini<sup>1</sup>, Patrizia Casagrande-Proietti<sup>1</sup>, Claudio Forte<sup>1</sup>, Daniela Beghelli<sup>2</sup>, Gabriele Acuti<sup>1</sup>, David Ranucci<sup>1</sup>, Alessandro Dal Bosco<sup>3</sup>, Cesare Castellini<sup>3</sup>, Massimo Trabalza-Marinucci<sup>1</sup>

<sup>1</sup>Dipartimento di Medicina Veterinaria, Università degli Studi di Perugia, Italy

<sup>2</sup>Scuola di Scienze Ambientali, Università degli Studi di Camerino, Italy

<sup>3</sup>Dipartimento di Scienze Agrarie, Alimentari ed Ambientali, Università degli Studi di Perugia, Italy

Corresponding author: massimo.trabalza@unipg.it

A total of 150, 1-day-old female broilers (Ross 308) were divided into 2 groups of 75 birds each and fed a starter diet from 1 to 21 days and a grower-finisher diet from 22 to 56 days. The two experimental diets were based on a standard commercial feed used as control (C group) which was supplemented with 2 g/kg oregano aqueous extract (OAE) (O group). Individual body weight (BW) and feed conversion efficiency (FCE) were measured. Blood samples from 5 chickens/group were collected for IgG titration at 22 (T1) and 57 days (T2). At the same time intervals, 8 samples were collected for intestinal microflora examination. Physico-chemical parameters were determined on 10 breast meat samples of both groups. The OAE supplementation affected the BW of birds (P<0.01) up to 22 d of age, while no effects were observed at 36 d and at the end of the experiment. A numerically lower FCE was observed at 36 and 57 d in birds fed the OAE diet. Although the dietary treatment did not appear to affect mean serum IgG values in terms of absolute numbers, their increases (expressed in percentages) from T1 to T2 revealed a significant (P<0.05) dietary effect with the highest value in the O group. Regarding gut microbiota data, coliforms were lower (P<0.001) in the cecum of the O group. The *Enterococcus* spp. resulted higher in the OAE group (P<0.001), particularly in the caecum tract, and its value increased at T2, supporting the hypothesis of a time-dependent effect. Birds in the C group showed the highest values for *Lactobacilli* in the ileum and cecum tracts at T1. Values increased (P<0.001) in the O group at T2, showing a potential time-dependent effect. No differences in the physico-chemical parameters of meat were recorded between groups, except for the drip loss value (1.46% in the C group vs. 1.17% in the O group, P=0.03). The OAE supplementation reduced meat oxidation as confirmed by TBARs values (0.150 vs. 0.246 for O and C groups, respectively; P=0.001). Considering the obtained results, OAE could be able to improve chicken performance and immune response, and balance gut microbiota. Although these results are in agreement with others (Garrido *et al.*, 2004; Cross *et al.*, 2007), further studies are needed to ensure the actual effectiveness of aqueous extracts on the performance and welfare of broiler chickens.