



ASPA 24th Congress Book of Abstract

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ASPA 24th Congress

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Table of Contents

<hr/> MAIN LECTURES		<hr/> POSTERS	103
Management strategies to improve animal health, welfare and resilience	1	<hr/> INDEX OF AUTHORS	196
Nutritional profile of food	1		
<hr/> ORAL COMMUNICATIONS			
Alternative feeds and waste recycling	16		
Nutritional profile of food	18		

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TMR composition, while IVNDFD was positively related to milk fat (R^2 0.75, $p < .001$). Saturated FA averaged 70.3 ± 3.8 , mono-unsaturated FA 26.1 ± 1.3 , and polyunsaturated FA 3.6 ± 0.5 , data in line with previous reports. Weak relationships were found between TMR composition, TMR particle size and FA composition of milk fat. Overall, the survey highlighted that TMR particles larger than 19 mm were dramatically higher than the recommended values for lactating cows. Nevertheless, the low incidence of metabolic disorders and the satisfactory milk yield suggests the need of establishing particle size ranges of TMR specific for buffaloes.

Acknowledgements

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P042

Sea bream fillet quality as affected by alternative protein sources in diet

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Gilthead seabream (*Sparus aurata*) has been the object of intensive farming as early as the seventies. Nowadays it represents the most popular marine finfish in Italy and its farming is an important activity both for the productive volumes and economical value. As part of the aquaculture sector, seabream farm is suffering for feedstuff shortage, being fishmeal and oil highly unsustainable. Thus, the present study aimed to evaluate different protein sources in seabream diet: (i) a fish meal-based (54%) control diet (CF), (ii) a plant protein meal-based control diet (CV); the other four diets were based on the CV diet, with: (iii) 10% substitution with a mixture of microalgae (*Tisochrysis lutea* and *Tetraselmis suecica*) meal (M10), (iv) 10% substitution with the meal obtained by processing the invasive alien Louisiana red swamp crayfish (*Procambarus clarkii*) (R10), (v) 20% substitution with poultry by-product meal (PBM) (P20), (vi) 40% substitution with insect meal (*Hermetia illucens*) (H40). Ten fish per group were sampled at the end of the growing trial and the physico-chemical characterization of fish fillets was assessed. The results revealed that M10 diet slightly but significantly decreased fish total body weight (around 303 g against 335 g, as average of the other groups). Despite this, M10 fish had analogous fillet yield than the other groups (53%). Diets differently affected skin and fillet color values. Specifically, the results of skin color indexes (lightness, L*; redness, a*; yellowness, b*) displayed differences in the skin of the fish fed with M10, which was significantly lighter than the P20 group skin (L*: 76.41 and 69.69,

respectively). Fish fed H40 showed a b* index (1.28) significantly higher than the b* value of CF group (−3.85). Contrariwise, fillet color values were not modified by the dietary treatments. Looking at the nutritional values, the incidence of polyunsaturated fatty acid (FA) of the n-3 series was higher in CF fillets (23.86 g/100 g total FA) than in the other groups (19.51 g/100 g total FA, as average), while M10 and CV fillets had interesting amount of C18:3n-3 (8.37 and 8.46 g/100 g total FA, respectively). To sum up, microalgae seemed to induce the major changes in fish characteristics, while all the other ingredients could be considered to replace conventional protein sources in aquafeed for gilthead seabream.

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P043

Does honey bee pollen as dietary supplement effectively preserve sea bream fillets during frozen storage?

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Recently, the possibility to increase fish health, welfare, and fish storage stability through feed supplementation with natural additives or bioactive molecules has gained importance. Honey bee pollen (HBP) contains several interesting compounds such as polyphenols, which a new extractive technique called supercritical fluids extraction (SFE) seems to preserve. Indeed, SFE extract showed good antioxidant properties, high polyphenol content, radical scavenging activity, and reducing power. If these properties might act as antioxidants to preserve fish fillet quality during storage deserves to be investigated. Thus, our aim was to evaluate the effectiveness of honeybee extracts added to gilthead sea bream (*Sparus aurata*) feed formulation on the preservation of frozen fillet characteristics.

Two levels of HBP (5% or 10%, P5 or P10 treatments, respectively) and its supercritical fluid extract (0.5% or 1%, E0.5 or E1, respectively) were included in the sea bream diet. After 15 days of adaptation, fish were fed for 30 days, then 9 fish per experimental group were sacrificed and filleted. Fillets were stored at -10°C for 110 days and their fatty acids (FAs) were detected at slaughtering (day 0) and at the end of the storage (110 days). Analogously, lipid oxidation was assessed by conjugated dienes

(CD, mmol hydroperoxides/100g meat) and thiobarbituric acid reactive substances (TBARS, mg MDA-eq/kg meat) quantification. The PROC GLM of SAS was used to analyse the obtained data with dietary treatment and storage time as fixed effects.

Frozen storage caused a loss of polyunsaturated fatty acids (PUFA) of the n-3 series, while a higher content of saturated fatty acid (SFA) was found at day 110th ($p < .05$). Consistently, TBARS raised from 0.627 to 1.123 mg MDA-eq/kg fillet during storage ($p < .05$). E1 group was the most effective in oxidative damage mitigation, by exerting a specific protection on C18:3n-3, C18:4n-3, C20:1n-9, and C22:1n-11 FAs. Noticeably, eicosapentaenoic (EPA) and docosahexaenoic (DHA) acid content did not decrease along storage.

In conclusion, administered HBP supercritical fluid extract at 1% seemed to slightly protect sea bream fillets from oxidative damages during long term frozen storage. Nevertheless, its action was limited to specific PUFA n-3 and few monounsaturated FAs. Due to the importance of finding natural bioactive products to improve fish metabolism, stress response, and fillet quality, further comprehensive studies are encouraged.

P044

Fatty acid profile of Sarda suckling lamb meat with different fat content

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Suckling lamb meat is one of the most relevant products in the traditional dairy sheep farming in many Mediterranean countries. The lambs are usually raised with their dams and fed almost exclusively maternal milk; they are slaughtered at 25–30 days of age and 9–11 kg of body weight. Body composition, carcass and meat characteristics are very heterogeneous among individuals, since they depend on farming management, breed, milk composition, etc. Meat from suckling lamb is one of the main sources of health-promoting natural fatty acids (FA), as the conjugated linoleic acid (CLA), the polyunsaturated fatty acids of n-3 series (PUFA n-3) and the long-chain fatty acids. Therefore, lamb meat with high concentration of PUFA n-3 and CLA could be of great nutritional interest. We conducted a study to investigate the variation of FA composition of meat from Sarda suckling lambs with different content of intramuscular fat. Sarda lambs, reared in Central of Italy, were slaughtered in autumn and spring season, and Longissimus thoracis muscle was taken at 24 h after

slaughter to perform the analysis. Samples were analyzed for ash, crude protein, total fat content and fatty acids profile. The samples were classified according to the total fat content and the samples from 24 animals equally divided into 3 groups as follows: low-fattening $2.3 \pm 0.2\%$, medium-fattening $4.5 \pm 1.5\%$, and high-fattening $6.3 \pm 1.8\%$. The relative amounts of saturated (SFA), monounsaturated (MUFA), polyunsaturated (PUFA) fatty acids, hypocholesterolemic/hypercholesterolemic index (h/H), atherogenic index (AI) and thrombogenic index (TI) were estimated. The results showed a significantly lower PUFA content in animals with high fat (21.41% vs. 25.32% as averages for medium and low-fat content respectively, $p = .008$), but highest levels of MUFA ($p = .049$) and SFA ($p < .001$); this trend was probably due to a major intermuscular fat content. The low-fattening group showed the best values as far as all nutritional fat indexes such as the n-6/n-3 ratio ($p = .038$), h/H index ($p = .004$), in particular a high level of n3-PUFA (7.00% in low fat meat vs. 5.51% in high fat meat fatty acid, $p = .007$). Percentage of total CLA did not differ significantly between groups ($p = .208$). These results highlight the importance of fat accumulation in body lambs that makes substantial changes in fatty acids profile of meat. In fact, lean meat showed nutritionally higher values in particular as regards the n3 essential fatty acids.

P045

The incidence of fresh forage in sheep diet on Pecorino di Filiano DOP cheese quality

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Pecorino di Filiano DOP (PFC) is a ripened hard cheese made with ewe's raw milk of Gentile di Puglia breed, in the NW area of Basilicata, Southern Italy. The feeding system is based on pasture, with possible use of fresh forage, hay and grain exclusively produced in the cheese production area. The growing consumer interest in healthy quality cheeses demands tools for expressing it in a synthetic way. Our aim was to evaluate the effect of the fresh forage content in the diet on the PFC quality in terms of DAP (Antioxidant Protection Degree), HPI (Health Promotion Index) and GHIC (General Health Index of Cheese) indexes. The experiment was carried out on the CREA farm in spring. Four groups of twenty sheep each, homogeneous by BCS and DIM,