



ASPA 25th Congress Book of Abstract

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ASPA 25th Congress

Monopoli (BARI - ITALY), June 13-16, 2023

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ASPA 25th Congress Book of Abstract

The 25th congress of the Animal Science and Production Association

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**Monopoli (BARI - ITALY),
June 13-16, 2023**

Venue

Torre Cintola Natural Sea Emotions

Località Capitolo - Monopoli (BARI - ITALY)

the GGP Equine70k SNP chip. Genomic inbreeding coefficients were derived by means of Runs of Homozygosity (ROH) assessment. The ROH segments were detected using the DetectRUNS package in R and defined as follows: at least 15 SNPs in a run, a minimum length of a run equal to 500 Kb, a lower density limit of 1 SNP per 100 kb and allowing for a maximum of one missing and one heterozygous SNP in a run. The genomic inbreeding coefficients (FROH) were calculated as the proportion of individual genome size covered by ROH. Based on the hypothesis that ROH length reflects the chronological time points at which inbreeding occurred, the FROH was expressed separately for five length ROH categories (0.5–1 Mbp, 1–2 Mbp, 2–4 Mbp, 4–8 Mbp, >8 Mbp). Finally, ROH island discovery defined as ROH shared in over 80% of the horses within breed were retrieved as possible signatures of selection. The overall FROH mean was 0.18 (SD =0.05) with a maximum of 0.24 (SD =0.03) in the Lipizzaner and a minimum of 0.11 (SD =0.05) in the Monterufolino breed. In all breeds the majority of the ROH were relatively short (86.3% were less than 2 Mbp long), highlighting the occurrence of older inbreeding, rather than a more recent one. However, all breeds except the Cavallo Pentro showed individuals with ROH longer than 8 Mbp which might be interpreted as a more recent reduction of genetic variability. A total of 16 breeds showed ROH islands with an average of 5.1 ROH island per breed (SD =4.47), highlighting the potential presence of selection in those regions.

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O405

Digestibility of raw materials candidate for sustainable feed formulation in Mediterranean yellowtail (*Seriola dumerili*)

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With the aim of increasing the efficiency and sustainability of recirculating aquaculture systems (RAS), this study compared the digestibility of cutting-edge ingredients and aquafeed, the physical characteristics of feed pellets and faeces and the rate of ammonia excretion in Mediterranean yellowtail (*Seriola dumerili*). The fish were fed 5 experimental diets which were

prepared by mixing a fishmeal-based control diet (crude protein: 51.8% DM; crude lipid 13.6% DM) with one of the alternative ingredients in a ratio of 7:3, i.e. porcine haemoglobin (diet PH), soy protein concentrate (diet SPC), hydrolysed wheat protein (diet HWP), potato protein (diet PP), and beet pulp (diet BP). A total of 20 fish (271 g ± 9.5 g) were randomly distributed into 5 RAS tanks (4 fish per tank) equipped with a Guelph system and fed for 12 weeks the diets. A Latin square experimental design was used based on 5 diets ×5 tanks (2 weeks per diet per tank). Regarding digestibility of raw materials, soy protein concentrate and porcine haemoglobin showed the highest protein digestibility compared with other ingredients (85.5% vs. 68.1%; $p < 0.05$); beet pulp and porcine haemoglobin showed the highest lipid digestibility compared with potato protein (96.0% vs. 90.3%; $p < 0.05$). As for diets, apparent protein digestibility was higher in diet BP than in diets PP and HWP (94.1% vs. 86.4%; $p < 0.05$) whereas other diets performed in between. Apparent lipid digestibility was lower in diet PP compared with other diets (96.8% vs. 98.0%; $p < 0.05$). With regard to physical properties of feed pellets, no differences in oil leakage (%) were found between the experimental diets ($p > 0.05$), while the lowest water turbidity at 15 min after feed administration was recorded for diets PH and HWP (3.7 vs. 4.4 mg L⁻¹; $p < 0.05$). Considering faeces characteristics, no differences according to diets were found in fine (≤0.5 mm), middle (0.6–1.2 mm) and large (>1.2 mm) faeces particles and furthermore, either the volume (%) of the three classes of faecal particles did not differ. Regarding ammonia excretion, a maximum (N-NH₄⁺ mg kg⁻¹ fish⁻¹ × h) was reached between 4 and 6 h after feed ingestion without differences among diets ($p > 0.05$). Overall, the tested ingredients are worth of further investigation in order to make sustainable choices of alternative ingredients that satisfy the dietary requirements of Mediterranean yellowtail and provide best performance in RAS.

O404

Growth and quality of fish reared in haloponics

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The study evaluated the effects of three water salinity levels (0.5‰, 3.0‰, and 6.0‰) on fish growth and fillet colour, pH, lipid peroxidation (TBARS), proximate composition and fatty acid profile of black bullhead catfish (*Ameiurus melas*) and rainbow trout (*Oncorhynchus mykiss*) reared in a brackish-water aquaponic (haloponic) system during a 9-month production cycle. A

total of 261 black bullhead catfish (initial weight 147 ± 22 g) were randomly distributed among the three experimental treatments (three units per treatment; initial stocking density 8.53 kg m^{-3}) and reared for 268 days (September-June). In December, 150 rainbow trout (initial weight 153 ± 22 g) were added to the system (initial stocking density 5.10 kg m^{-3}) and reared for 103 days in polyculture with catfish (December-March). During the trial, two cultivation cycles of Swiss chard of 'Nostrana' (1st cycle) and 'Pugliese' (2nd cycle) varieties were carried out (12 plants m^{-2} , 24 plants per unit). As for rainbow trout, water salinity did not affect fish final weight (348 g, on average), survival (89.7%) and fillet yield (52.0%), as well as colour, TBARS (0.30 mg kg^{-1} of malondialdehyde), proximate composition, and fatty acid profile (total saturated fatty acids, SFA, 15.6%; total monounsaturated, MUFA, 49.8%; total polyunsaturated, PUFA, 34.6%). On the other hand, fillet pH was higher (6.38 vs. 6.31 ; $p < 0.05$) in trout reared at 6.0‰ than at 0.5‰ salinity. As for catfish, water salinity did not affect fish final weight (193 g) and survival (75.8%). Carcass yield was higher (+3%; $p < 0.05$) in fish reared at 0.5‰ than at 3.0‰ salinity, whereas fillet yield was higher (+6%; $p < 0.05$) in fish reared at 3.0‰ than at 6.0‰ salinity. No differences according to water salinity were found for fillet colour, pH (6.08), TBARS (0.44 mg kg^{-1} of malondialdehyde), and proximate composition. As for the fatty acid profile of catfish fillets, MUFA were higher (+7%; $p < 0.05$) in fish reared at 3.0‰ than at 0.5‰ salinity, whereas PUFA were higher (+7%; $p < 0.05$) in fish reared at 0.5‰ than at 3.0‰ salinity; intermediate values of MUFA and PUFA were found in fish reared at 6.0‰ salinity, while no changes were found for SFA. In conclusion, catfish and trout farming in haloponics is feasible until 6‰ salinity. The quality of trout fillets was not affected by water salinity, whereas changes were found in the fatty acid profile of catfish fillets, which warrant further investigations.

O493

Towards sustainable marine spatial planning of aquaculture in Apulia Region

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The existing conflicts between human uses in the coastal and offshore zone and the conservation of marine habitats are reconnected to the indications of the EU Marine Spatial Planning Directive. In this context, targeted and efficient measures of spatial planning may avoid potential conflicts as well as create positive synergies between activities and interests. In particular, the topic of marine and maritime sustainable development has been a focus of attention since 2012 and the EU Commission recognises aquaculture as a crucial sector with great innovation potential for a smart, sustainable and inclusive growth.

The identification of suitable areas for aquaculture requires the integration of multiple socio-economic and environmental factors that can be different for fish and shellfish farming and therefore the use of an approach based on the EU Marine Spatial Planning can guarantee the allocation of adequate maritime spaces for the sustainable development of both aquaculture systems.

The present study was carried out along the Apulia Region coastal zones with the aims to propose a conceptual model suitable for marine spatial planning of aquaculture; to collect and integrate indicators useful for the characterization of the study area in terms of socio-ecological-economic sensitivities and pressures; and to identify and map the suitable areas for the development of new fish and shellfish farming, taking into account the carrying capacity of natural resources and the effect of aquaculture farms on the quality of the marine ecosystem.

The maps that were produced from the zoning process show the marine-coastal areas classified as *potentially very suitable*, *potentially suitable* and *potentially unsuitable* areas for new aquaculture activities or for the expansion of existing ones. In the first two areas, there are no interferences with other users and the environmental conditions can guarantee the well-being of farmed organisms, the minimization of environmental impacts and the sustainability of the productions.