deacetylase inhibitor that play a predominant role in the epigenetic regulation of gene expression and cell function.
We investigated in European sea bass (*Dicentrarchus labrax*) the effects of butyrate used as a feed additive on fish epigenetics as well as its regulatory role in mucosal protection and immune homeostasis through impact on gene expression. Seven target genes related to inflammatory response and reinforcement of the epithelial defense barrier (*TNFα*, *IL1B*, *IL6*, *IL8*, *IL10*, and *MUC2*) and five target genes related to epigenetic modifications (*DICER1*, *EHMT2*, *PCGF2*, *HDAC11*, and *JARID2A*) were analysed in intestine and liver. We also investigated the effect of dietary butyrate supplementation on histone acetylation, by performing an immunoblotting analysis on liver core histone extracts.
Results of the eight-week-long feeding trial showed no significant differences in weight gain or specific growth rate of sea bass that received 0.2% Na-butyrate supplementation in the diet in comparison to control fish. Dietary butyrate led to a twofold increase in the acetylation level of histone H4 at lysine 8, but showed no effect on the histone H3 at Lys9. The expression of four (*IL1B*, *IL8*, *IRF1*, and *TNFα*) out of seven analyzed genes related to mucosal protection and inflammatory response was significantly different between the two analyzed tissues but only *IL10* showed differences in expression due to the interaction between tissue and butyrate treatment. In addition, butyrate caused significant changes in vivo in the expression of genes related to epigenetic regulatory mechanisms such as *HDAC11*, *EHMT2*, and *DICER1*. Statistical analysis by two-way ANOVA for these genes showed not only significant differences due to the butyrate treatment, but also due to the interaction between tissue and treatment.
In conclusion, data reported here could be essentials for the identification of functional additives for fish diets in the efforts to improve the sustainability of aquaculture.

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Effects of different feeds on performance of rainbow trout (*Oncorhynchus mykiss*) broodstocks

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In aquaculture, the feeding of broodstocks plays a key-role because it affects the quality of the gametes, their fecundity, hatching rate, fry survival and incidence of larval deformation, regardless of genetic selection and the strain employed. In recent years, the research of feedstuffs alternative to fish meal, in order to increase the sustainability of the productive cycle, has also been focalized on the feeding of rainbow trout (*Oncorhynchus mykiss*) broodstocks. Efforts are being concentrated on new diets able to guarantee health benefits, satisfying the essential requirements of females and males, as well as a good quality of gametes, larvae and fingerlings. Based on these assumptions, a trial was carried out employing 4-year-old broodstocks of rainbow trout in order to evaluate the effects of two feeds, containing feedstuffs of different protein and lipid source, on reproductive performance in terms of the quality of eggs, hatching rate and fingerling survival rate. Four months prior to the spawning season, broodstocks were selected and divided into two experimental Groups, with two replicates each (GF1-GF2, GV1-GV2). Groups GF were fed a diet containing fish meal and fish oil as control feed. Groups GV received a diet including legume protein feedstuffs and oil of vegetable origin (50% linseed oil instead of 50% fish oil). Proximate composition and fatty acid profile of the two feeds were analysed according to international methods. On viable eggs, incubated at 10 °C water temperature, the hatching rate and fingerling survival rate at 60 days were recorded in the different Groups. Data were submitted to one-way ANOVA and the differences between the means were evaluated by means of the Student-Newman-Keuls test (SAS, 1989) and considered significant at $p<.01$. Gamete and fingerling data were different among the batches, showing a significantly higher performance with regard to the quality of viable eggs in Groups GF compared to Groups GV. The hatching rate of GF was 92 ± 2% *versus* 71 ± 3% of GV. The survival rate of fingerlings at 60 days also showed notable differences being 74 ± 4% *vs* 49 ± 3% in GF and GV groups, respectively. Based on the results of this trial, it is possible to assume that feedstuffs containing vegetable protein and fat administered to broodstocks affected the quality of gametes and the progeny of rainbow trout negatively.

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