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NEUROENDOCRINE AND IMMUNE RESPONSES UNDERTAKE DIFFERENT FATES FOLLOWING TRYPTOPHAN OR METHIONINE DIETARY TREATMENT: TALES FROM A TELEOST MODEL

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Given their involvement in immune response mechanisms, it was decided to study the immunomodulatory effect of methionine and tryptophan on the inflammatory and neuroendocrine responses of the European seabass, *Dicentrarchus labrax*. Fish were fed methionine and tryptophan-supplemented diets (MET and TRP, respectively) or a control diet meeting the AA requirement levels (CTRL) for fourteen days. Fish were sampled for the assessment of the immune status whereas the remaining fish were sampled either 4 or 24 h post bacterial challenge. Respiratory burst (RB) activity, brain monoamines, plasma cortisol and immune-related gene expression clearly showed distinct and sometimes opposite patterns regarding the effects of dietary AA. RB was lower in TRP-fed fish but both supplemented induced plasma cortisol after the inflammatory insult whereas gene expression of glucocorticoid receptors was down-regulated. Though some pro-inflammatory genes were up-regulated by methionine, others were inhibited and further conclusions should be carefully taken. In contrast, tryptophan effects on pro-inflammatory transcripts and RB revealed a general inhibitory pattern which, together with high production of brain monoamine and cortisol, seems to point out tryptophan as key mediator of the neuroendocrine and immune systems cooperation. Overall, more studies are needed to ascertain the role of these AA in modulating fish immune and neuroendocrine responses.