

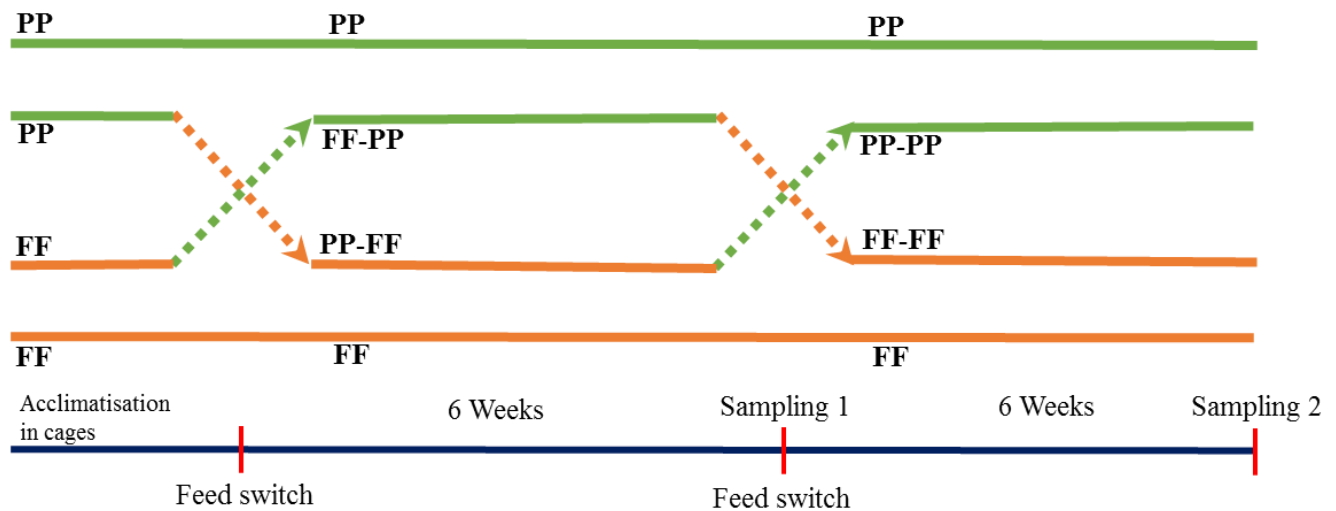
## Early nutritional programming to enhance the utilization of plant based diets in fish (largemouth bass, *Micropterus salmoides*)

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Aquaculture has been the fastest growing animal food-producing sector for over half a century. Sustainable aquaculture should include replacement of fish-based feed sources by plant-based ingredients. However, this approach is often impeded by poor growth in carnivorous fish such as largemouth bass (LMB, *Micropterus salmoides*) fed high levels of plant-based protein. Therefore, our overall goal of the present work was to develop alternative methods of utilizing the plant-based diets (PBD) for sustainable LMB production. When fish is exposed to PBD early in their life, they may accept them more efficiently at later stages (so called Nutritional Programming, NP). Therefore, we conducted a 3-phase (6 weeks each, 18 weeks total) feeding trial to evaluate the NP of a PBD in LMB (Figure-1).



**Figure 1: Experimental design (PP – Plant protein-based diet, FF- Fish meal based diet)**

**On phase I**, fish-larvae stocked into tanks 1 and 2 were fed a fishmeal-based diet (FM) or a soybean-meal-based diet (SBM), respectively. **On phase II** fish from each tank were divided into 2 tanks (tanks 3 and 4, respectively). Fish in tanks 1 and 2 continued to be fed the FM and SBM diets, while fish in tanks 3 and 4 were fed SBM and FM diets, respectively. **On phase III**, tanks 1 and 2 remained unchanged, while fish in tanks 3 and 4 were fed the FM and SBM diets, respectively. At the end of the study, no statistically significant differences were found for growth performance and whole-body proximate composition of fish. However, blood analyses revealed that LMB in tank 1 (fed FM throughout the study) had higher alanine aminotransferase and lower blood phosphorus than other groups. The liver, muscle and intestine samples were collected for further physiological study and will be presented. Overall, this study developed an alternative method of utilizing the PBD at early stage of life, which can reduce the cost of largemouth bass production.