

Development of Effective Microparticulate Diets for Marine Fish Larvae

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Capture fisheries cannot meet the current worldwide demand for seafood. Aquaculture makes up the deficit and will play a greater role as the world's population doubles over the next 30 years. Cultured Puget Sound marine fish species, such as Pacific halibut, sablefish, rockfish, lingcod and Pacific cod, could provide fish to supply future demand. Lack of nutritional information and a reliance on expensive and nutritionally variable live feeds impedes development of these new species for aquaculture. Nutritionally effective microparticulate diets could reduce dependency on live feeds and improve culture success. Altricial marine fish larvae are small and equipped with incomplete digestive systems making diet development challenging. Marine fish larvae may require low-molecular weight water soluble (LMWS) nutrients, such as amino acids, peptides and vitamins for growth. Currently we are evaluating the ability of several carrier particles to deliver LMWS to larvae. Effective microparticulate diets are readily acceptable, digestible and retain LMWS with minimal leaching prior to consumption. A method for quantifying leaching of LMWS from promising carrier particles is nearly complete. Complex particles (carrier particle + LMWS) will be evaluated using a sensitive quantitative method to determine apparent protein digestibility (AD). Completion of this sensitive AD method will result in a process for rapid dietary ingredient assessment. New inert markers, necessary for AD trials, that can be used easily with both live and microparticulate diets are also being evaluated. Long term grow-out using promising microparticulate diets is underway to look at growth response compared to traditional live feeds.