Developing a protocol for testing low phytic acid soy meal based feed on Pacific white shrimp - DTU Orbit (22/12/2018)

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Soy meal is an attractive alternative to more traditional protein sources for shrimp feeds due to its relatively low cost. However, 75% of the P in soybean grains is in the form of phytic acid (PA) which is not digestible by mono- and a-gastric animals such as shrimp. This leads to environmental detriment caused by the excess P in the waste of the animals. For this reason, soy meal is not commonly used in aquacultural animal feeds. Low PA (LPA) soybean varieties have been developed using genetic mutations which have up to 75% lower PA content than conventional varieties. In this study, a low error protocol was developed for studying the effect of LPA soy meal based feeds on the growth and environmental quality of Pacific white shrimp (Litopenaeus vannamei). Three different methods, differing in tank and population size and chemical analysis protocols, were compared to divine a low error testing method. It showed that using five shrimp over six weeks and a higher capacity ortho-P testing protocol had lower error and should be favored for studying the difference in water quality levels. However, none of the tested methods were particularly favorable for studying the effect of LPA soy meal based feeds on shrimp growth. It was suggested, that the meal effect on shrimp growth can be studied by either vastly increasing the population size (>100 shrimp/aquarium) or decreased (1 shrimp/aquarium) to account for shrimp death and variation in size between individuals.

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