Novel feed formulation for Aquaculture

TRansition paths to sUstainable legume-based systems in Europe
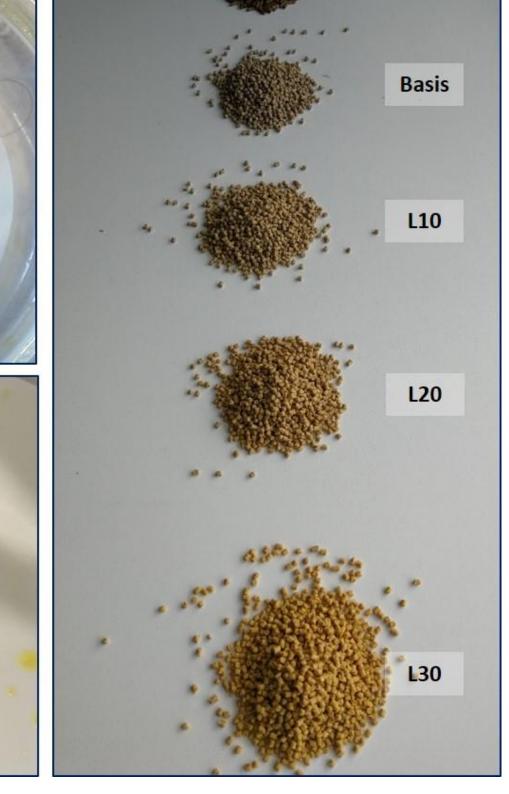
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Blue Lupin for White Shrimp? A step towards sustainable aquafeed

Most of the world's rising demand for fish and shellfish is met by aquaculture. High protein fish feeds are generally produced with substantial amounts of fish meal – which is expensive and unsustainable. Legumes are being tested as sustainable, local replacements for fishmeal in feeds for important European aquaculture species like White Leg Shrimp, Atlantic Salmon and European Sea Bass. In the present study we formulate aquafeeds with lupin kernel meal (*L. angustifolius*) for the White Leg Shrimp *Litopenaeus vannamei*, one of the world's most important aquaculture species.
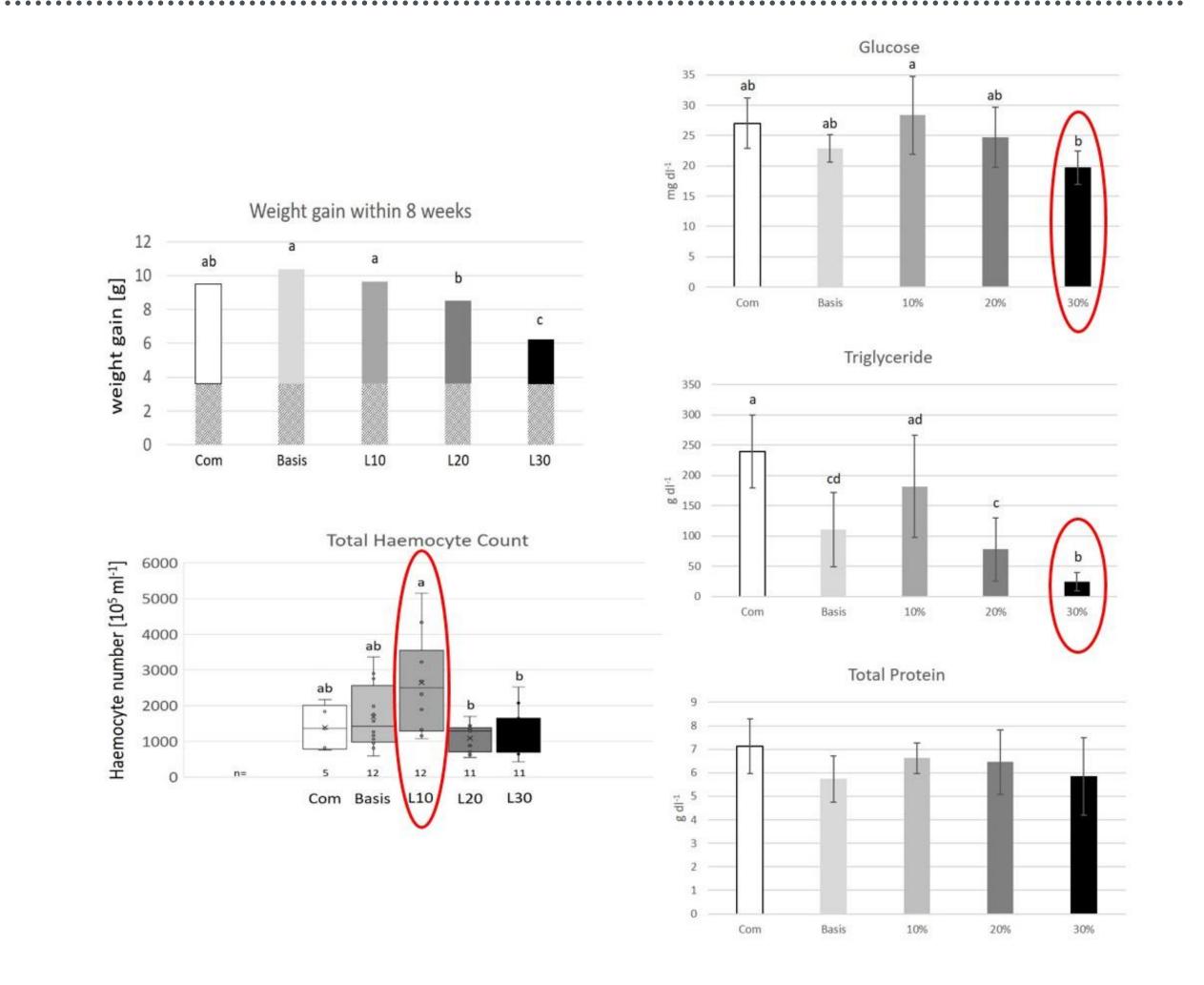

Material and Methods

An experimental diet (Basis) with 30% fish meal was formulated. *Lupinus angustifolius* kernel meal was added as 10, 20 and 30 % of the diet, incrementally replacing fishmeal. All diets were balanced to meet the requirements of *L. vannamei* at grow out, i.e. equal energy content, protein and amino acid profile, lipid and fatty acid composition, vitamins and minerals. A commercial control was also maintained. Feeding experiments were conducted over 8 weeks in a RAS device, with 18 separate 50 l tanks each stocked with 25 shrimp. Experimental diets were fed in 4 replicates, the commercial diet in duplicate.

Results and Discussion

- Survival rate 65% no significant differences
- Growth of animals fed L30 significantly lower
- Metabolic analyses (glucose and triglycerides) show malnutrition of animals fed the L30 diet
- Good protein provision with all experimental feeds
- Total Haemocyte count significantly higher in L10: elevated immune capacity?
- Colouring of the animals varies depending on the feed: favorable red/brown in lupine fed animals

Untreated lupine meal can be used as an alternative protein source up to 10% (-20%) of the feed.

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