

Whomever it may concern,

My perspective is that of an aquaculture feed company and I hope it may be of value.

(1) Groundbreaking research on alternative dietary ingredients (feedstuffs) for aquaculture, including plant based proteins, is expanding the United States and worldwide. Where should the federal government focus its research efforts in the area of alternative feeds for aquaculture? Are there specific areas that the federal government should not address?

I am not making specific suggestions on any plant protein or novel ingredients as I am sure a great deal of ideas are already available or have been presented. Instead I would suggest that when considering these new options, the feasibility to commercialize them should be heavily weighed before further research is considered. Are these ingredients capable of being produced in very large quantities? Often the ideas I see presented for ingredient substitutes are sound in theory but they can not be scaled up to commercial demand as desired.

Also I recommend one consults with a feed company about how any new or proposed ingredients might impact production of a feed. There are many great ideas that seem to be pursued without proper consideration of how they may be affected by the extreme physical conditions (heat, pressure, etc) of extrusion processing utilized in feed manufacturing.

2) What are potential alternative sources of protein and oil for aquaculture feeds? For example, are there specific opportunities for greater use of seafood processing waste and other agricultural by-products in aquaculture feeds? Are there specific obstacles to using these alternatives as alternative dietary ingredients in aquaculture feed?

In my opinion there is great opportunity for the use of fisheries by-products (seafood processing waste) and the current availability of such materials is too limited. Utilizing scraps is a sustainable means to reduce waste and as we know, piscivores such as many of the species we are culturing are most fit to consume fish based proteins so why not if they are going to be thrown out anyway?

Additionally I believe we must support the utilization of other protein by-products for inclusion in aquaculture diets. Tremendous amounts of viable and valuable protein/energy sources are discarded or wasted as scrape material from poultry processing and similar industries. Many of these potential sources are processing facilities for products intended for human consumption. As a result the safety and quality of these by-products is excellent and their value to the feed industry can be tremendous.

Both of these options present great opportunity for the feed industry and are being utilized to the extent possible. Unfortunately one of the greatest hindrances is that consumers and some groups or retailers are demanding feeds be free of certain animal by-products yet the evidence for why they make such demands is very lacking. Better education and understanding about the safety and value of such feedstuffs could help turn the public's opinion and increase acceptance, reduce waste and increase "sustainability", at least in my opinion. This may be an uphill battle but there is a relatively logical case to be made here.

4) Fish meal and fish oil contribute important human nutritional components to aquaculture feeds such as omega 3 fatty acids. As the aquaculture feeds industry seeks to replace fish meal and fish oil with alternatives, how can the nutritional benefits of farmed seafood be maintained or enhanced? For example, what technologies exist for producing omega 3 fatty acids?

This is hardly news, but the algal based derivations of omega 3's from companies such as Advanced BioNutrition represent one great option to limit reliance on fish meal/oil and retain the desired health advantages of seafood. Sources such as this must become more cost effective before large scale inclusion is likely. Some of the best options for maximizing omega 3 availability to the consumer while reducing our reliance on them may come through the feeding regiments practiced on farms. Major research has already been conducted in Europe showing that the utilization of finishing diets with certain species allows for omega 3 levels to be boosted or returned to normal within the last few weeks of an animal's life, thereby allowing for the use of low fish meal/oil diets through much of the production cycle.

Best regards,

Chris

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