More Than Protein: The Role of Egg Phospholipids and Cholesterol in Aqua Feed

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The Changing Landscape of Aquafeeds

Over the past two decades, aquaculture has made remarkable progress in reducing its dependence on fish meal and fish oil. The increased use of plant-based ingredients has improved sustainability and supported more cost-effective feed formulations. However, this transition has also altered the nutritional composition of aquafeeds, reducing the natural supply of cholesterol and structural phospholipids that marine ingredients traditionally provided.

As feed formulations continue to evolve, the industry's focus is gradually expanding beyond protein replacement toward maintaining the overall nutritional functionality of modern diets.

Why Cholesterol and Phospholipids Matter

The reduction of marine-derived ingredients has renewed scientific interest in cholesterol and phospholipids, two nutrients that are naturally abundant in fish meal and fish oil. Rather than serving only as lipid components, they are increasingly recognized for their contribution to normal physiological functions, efficient lipid transport, and nutrient utilization.

This changing perspective reflects a broader trend in aquaculture nutrition: evaluating feed ingredients not only by their protein content, but also by the additional nutritional functions they contribute to the final diet.

More Than a Protein Source

Whole egg powder naturally provides this combination of nutrients within a single ingredient. In addition to highly digestible protein, egg yolk is rich in phosphatidylcholine, phosphatidylethanolamine, sphingomyelin, and cholesterol. It also contains naturally occurring lutein and zeaxanthin, contributing to a well-balanced nutritional profile.

As interest in functional feed ingredients continues to grow, naturally occurring sources of structural lipids are becoming increasingly relevant to modern aquafeed formulation.

Recent Research Highlights the Importance of Lipid Nutrition:

Recent findings published by Sissener et al. (2025) reinforce this emerging trend. In Atlantic salmon, diets containing lower levels of saturated lipids and cholesterol resulted in reduced growth performance, lower fillet firmness, greater liquid loss, and decreased muscle astaxanthin concentration, despite identical dietary astaxanthin supplementation. These results demonstrate that dietary lipid composition can influence both fish performance and the efficient utilization of nutrients.

Supporting this concept, Zhang et al. reviewed the mechanisms governing carotenoid absorption, metabolism, and deposition in aquaculture species, emphasizing the importance of normal lipid digestion and transport for efficient carotenoid utilization. Although the review did not investigate egg-derived lipid sources, it further highlights the growing recognition that lipid nutrition extends beyond energy supply alone.

Take-Home Message

Naturally combining highly digestible protein with phospholipids and cholesterol, Exwin46 Whole Egg Powder offers a multifunctional nutritional profile that aligns with the evolving priorities of modern aquaculture.

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