



***F3 - Future of Fish Feed** is a collaborative effort to support innovative replacements for wild-caught marine ingredients in aquaculture feed.*



Dear F3,

We hope all of you are having a wonderful start to 2024. As we ring in the new year, we'd like to share with you our highlights from last year and what's ahead!

In 2023...

F3 Krill Replacement Challenge Launched

The F3 team launched our fourth innovation challenge in June — [the F3 Krill Replacement Challenge](#) — to reduce our dependence on krill in aquaculture feed, and enhance food security. The contest was motivated by feed companies, particularly from China, who suggested finding alternative attractants and palatants would greatly assist in the transition to feed free of marine animal ingredients.

The interest was overwhelming, with 40 companies registering krill replacement products for the contest. It was no easy task for the F3 judges to select finalists from such a talented pool of innovative products, but we are excited about the 10 competitors selected to compete in the 12-week Atlantic salmon feeding trial, and five alternates who are standing by.

New Research Published

Two peer-reviewed papers were published by the F3 Team last year:

- Marine ingredient-free feeds show promise for Atlantic salmon! A study that formed the basis for our krill replacement contest, and published in the journal [Fishes](#), highlights the effectiveness of krill meal as a nutrient source in plant-based aquafeeds, and krill meal's lack of effect as a supplement in animal-based aquafeeds for Atlantic salmon. This indicates a good krill replacement could be the next step towards plant-based aquafeeds.
- A recent study led by researchers at Florida Atlantic University's Harbor Branch Oceanographic Institute achieved total replacement of fishmeal and fish oil in pompano, raising hopes for more sustainable farming for a fish that is widely consumed in China and Taiwan. The study was published in the journal [Frontiers in Aquaculture](#).

F3 Welcomed a New Coordinator



We welcomed Emma Hoffman as the new F3 Coordinator in July of last year. Emma was thrilled to dive in right as the Krill Replacement Challenge launched and has been having a blast meeting the F3 community and getting up to speed on the latest advances in aquafeed. Emma took over for Kelly Campbell who left to pursue a Ph.D.

F3-Related News

Our contest is not without controversy as the largest industrial krill fishing company Aker BioMarine questioned it in a recent [SeafoodSource](#) article. However, F3 Chair and University of Arizona professor Kevin Fitzsimmons pointed out that Aker's criticism was misguided. "The debate of how many krill are in the Southern Ocean continues, but so does the build-out of a fleet of krill-harvesting vessels in China," he said.

Many of the companies that registered for the F3 Krill Replacement Challenge were interviewed by [Aquafeed Magazine](#).

F3's Kevin Fitzsimmons discussed highlights from 2023 and the outlook for 2024 in this [The Fish Site](#) article. Some notable excerpts include:

- "Every new product that comes on is another arrow in the quiver and as the feed millers develop new feeds they are going to need less and less fish oil and fishmeal to meet nutritional needs."
- "From what I understand Corbion and Veramaris are selling every millilitre of algal oil that they can produce and there are other outfits ... are selling everything they can produce."

An interactive graphic story by an Associated Press investigative team, underlines the threats industrial fishing poses to the fragile Antarctic ecosystem and to the krill populations themselves. Read more [here](#).

In 2024...



F3 Challenge Trial Begins

The companies participating in the F3 Krill Replacement Challenge have shipped their product and the F3 Team is busy blind-labeling these ingredients for the experimental feed growth trial to begin in March where trial weight gain, survival and feed conversion ratio will be measured. A winner is expected to be announced in late 2024.

F3 Meeting in 2024

A face-to-face F3 Meeting has not been held in almost 5 years so we are looking forward to gathering again in May 2024. We hope to enhance this invite-only meeting with recorded options for those not able to attend.

[Watch highlights from the 2019 F3 Meeting](#)

Looking Ahead

The importance of finding and encouraging alternatives to wild-caught fish and krill has become even more urgent in 2024. Shortages in Peruvian anchoveta have led fishers to request a second closure in the fishery, causing price hikes for fishmeal. We were informed that some of the innovative substitute ingredients that we showcase were relied upon heavily in 2023 during the first Peruvian fishery closure in which fishmeal plants were shut down for the first time in 30 years.

From these recent headlines, it is clear that nutritionally similar substitutes to fishmeal and fish oil for farmed seafood are urgently needed and critical for global food security.

At the F3 Team, we are always looking for ways to facilitate the transition to marine-ingredient free feeds (fish and krill free). Send us any advancements you would like us to share or products you would like listed on the F3 Feed Innovation Network's suppliers list of ingredients, feeds, farms or retailers at f3fishfreefeed@gmail.com.

The hopeful note in 2024 is that it is you — the innovators, investors, buyers and researchers — are pushing the envelope of what is possible for food security and for our planet.

Here's to another year of advancing aquafeed innovation. Wishing you great advancements for 2024!

Warm Regards,
The F3 Team



Learn more at
F3Challenge.org

By promoting innovative alternatives to wild-caught fish and krill, the F3 initiative supports the aquaculture industry in meeting the food security needs of our growing world population while safeguarding our oceans and wild fish stock for future generations.

F3 Future of Fish Feed | f3fishfreefeed@gmail.com | F3Challenge.org | F3fin.org

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