

F3 Fish-Free Feed Challenge: Forage Fish Savings Estimate

What we know:

- Total F3 Feed Sales from the Challenge: **121,259 metric tonnes**
- 98% of sales came from Evergreen and Htoo Thit. which sold feeds for carp and tilapia.

Assumptions:

1. The calculation is based on the average carp and tilapia diets, which use 2% fishmeal, 0% fish oil and have a feed conversion ratio of 1.6.
2. FCR is 1.6 for both the original and new (F3) diets.
3. Use of byproduct in fishmeal and fish oil production has been set to 33%, [as estimated by IFFO](#), thereby reducing the need for whole forage fish by that amount.
4. The forage fish species used in this calculation is Anchoveta (Peruvian anchovy), which has a composition of [24% fishmeal, 5% fish oil](#) and an [average weight of 19.35g](#).

Typical diet for carp/tilapia.

Fishmeal %: 2

Fish oil %: 0

Feed Conversion Ratio: 1.6

Improved Diet for carp/tilapia:

Fishmeal %: 0

Fish oil %: 0

Feed Conversion Ratio: 1.6

Calculation:

1 tonne of carp/tilapia uses 1.6 tonnes of feed (based on feed conversion ratio).

Since 121,259 metric tonnes of feed was sold, that is enough to make 75,786.875 tonnes of carp/tilapia. (121,259 / 1.6).

For **75,786.875** tonnes of carp/tilapia:

RESULTS	Original Diet	Improved Diet
Feed Requirement (tonnes) (production amount * feed conversion ratio)	121,259.00	121,259.00



Limiting Ingredient (calculated using Forage Fish Dependency Ratio (FFDR) ¹)	Fishmeal	N/A
Forage Fish Requirement (tonnes) (FFDR of Limiting Ingredient * Feed Requirement * 0.67 ²)	6,770.29	0
# Forage Fish (Forage Fish Requirement / Weight of a Single Forage Fish ³)	349,886,003.45	0
Excess Amount of Non-Limiting Ingredient (tonnes) (Amount of non-limiting ingredient created by amount of forage fish needed - Amount of non-limiting ingredient needed for production amount)	338.51 (Fish Oil)	N/A

¹The Limiting ingredient (fishmeal or fish oil) is determined by calculating the Forage Fish Dependency Ratio: Ingredient Rate of Inclusion in Feed (%) / Ingredient Yield from Forage Fish (%). Whichever ingredient results in the higher dependency ratio is limiting.

²Use of byproduct in fishmeal and fish oil production has been set to 33%, [as estimated by IFFO](#), thereby reducing the need for whole forage fish by that amount.

³The forage fish species used in this calculation is Anchoveta (Peruvian anchovy), which has a composition of [24% fishmeal, 5% fish oil](#) and an [average weight of 19.35g](#).

*See [here](#) for explanation of above table calculations.

Final Results

Therefore, by using the **improved diet**, we estimate that the F3 Fish-Free Feed Challenge saved **349,886,003** forage fish in total.

