

**The Experiments:**

***Tilapia fish***



**Before** adding the vegetal source of omega 3 to the fish feed

% Omega 3 fatty acids from all fatty acids in the meat	Omega 3 : Omega 6 Ratio in the meat
3.5%	1 : 6.8

**After** adding the vegetal source of omega 3 to the fish feed (after 4 months)

% Omega 3 fatty acids from all fatty acids in the meat	Omega 3 : Omega 6 Ratio in the meat
7.4%	1 : 2.6

***Carp fish***



**Before** adding the vegetal source of omega 3 to the fish feed

% Omega 3 fatty acids from all fatty acids in the meat	Omega 3 : Omega 6 Ratio in the meat
3.15%	1 : 1.68

**After** adding vegetal source of omega 3 to the fish feed (after 2 months)

% Omega 3 fatty acids from all fatty acids in the meat	Omega 3 : Omega 6 Ratio in the meat
4.9%	1 : 1.39

**Omega 3 Trial in Carp summer 2007**

During summer 2007 we conducted a trial in the Unit of Intensive Fish Farming in Ginossar, sponsored by the Department of Fishing and Water Agriculture of the Ministry of Agriculture and Rural Development in Israel.

Extruded linseed, produced by Valorex company (Valomega 160), was added during 90 days to the carp feed. We used 6 plastic ponds 300 cubic meters each (3 for control groups and 3 for experiment groups). 3-4 fish in cubic meter, around 1100 fish in each pond. The carp weight in the beginning of the trial was around 900 grams and around 1500 grams in the end.

The fatty acid profiles are reported on the following table:

	CONTROL D0	TRIAL D0	CONTROL D90	TRIAL D90
Total ω3 fatty acids	3.52%	3.52%	3.08%	4.23%
Omega 3: Omega 6	1 : 4.8	1 : 4.8	1 : 6.3	1 : 4.4

From the laboratory results we can see that the omega 3 level increased significantly, the omega 3: omega 6 ratios improved; all this without any negative effect on the daily growth of the carp.

### Omega 3 Trial in Tilapia March – August 2009

During March – August 2009 we conducted a trial in Tilapia fish farm in Costa-Rica. The farm produces around 20,000 tons of fresh tilapia every year. The fish are exported mainly to the USA in filets.

Extruded linseed, produced by Valorex Company (Omega BLE BBC), also called OmegaFish, was added during 3 months to the Tilapia feed before marketing stage. The main goal of this trial was to examine the use of the Extruded linseed in commercial feed and growth conditions.

We used 4 ponds (around 40,000 fish per pond) – 2 ponds in super intensive growth (80 fish in a square meter) and 2 ponds in semi intensive growth (around 2 fish in a square meter).

The tilapia weight in the beginning of the trial was 450-650 grams and around 1000 gram in the end.

	D0	CONTROL D100	TRIAL D100
Total $\omega$ 3 fatty acids composition (mg/100 g)	105.2	68.8	221
Omega 3: Omega 6	1 : 3.52	1 : 4.7	1 : 2.6

OmegaFish diet greatly increased the total omega 3 content in the fish meat. OmegaFish reduced the omega 3: omega 6 ratio, to the French ANC recommendation. The daily growth of the fish was not affected and no difference was detected between the groups.

### Omega 3 Trial in Pangasius

Pangasius is a required fish in Europe, U.S.A and Russia. The main production of this fish in the world is in Vietnam in the Mekong River. The Pangasius is a vegetarian fish, with tasty white meat, without bones, and therefore suitable also for children. The original omega 3 level in the meat is low.

Total production in Vietnam during 2008 is expected to reach 1,000,000 tons; 500,000 tons from the production will be exported to Europe, U.S.A and Russia.

Because of the increasing consumption of the Pangasius fish all over the world, and the importance of the fish quality, there is a unique importance in increasing the omega 3 level in this fish.

In April 2009, NUTRI ADVANCE FEED & INGREDIENTS Company with guidance of Dr Michel Guillaume in cooperation with Galidi Company, and Valorex Company, conducted a trial in commercial Pangasius fish farm in Vietnam.

During 70 days special extruded linseed (unique type of linseed and special extrusion process) was added to the fish feed. The linseed replaced part of the fishmeal in the feed.



Pangasius fish

The fatty acid profiles are reported on the following table:

	CONTROL D70	TRIAL D70
<b>Total <math>\omega</math>3 fatty acids</b>	<b>0.85%</b>	<b>2.23%</b>
<b>Total <math>\omega</math>6 fatty acids</b>	9.90%	3.68%
<b>Total Omega 3 in 100 gram fish meal</b>	<b>0.056 gram</b>	<b>0.236 gram</b>

From the laboratory results we can see that the omega 3 level increased by 4.2 fold.