



# **Fishmeal industry overview**

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## What is IFFO?

The International Fishmeal and Fish Oil Organisation, the global trade association representing fishmeal and fish oil producers and related trades.

Represents two-thirds of world production plus 95% of exports of fishmeal and fish oil worldwide





# History of fishmeal & oil use

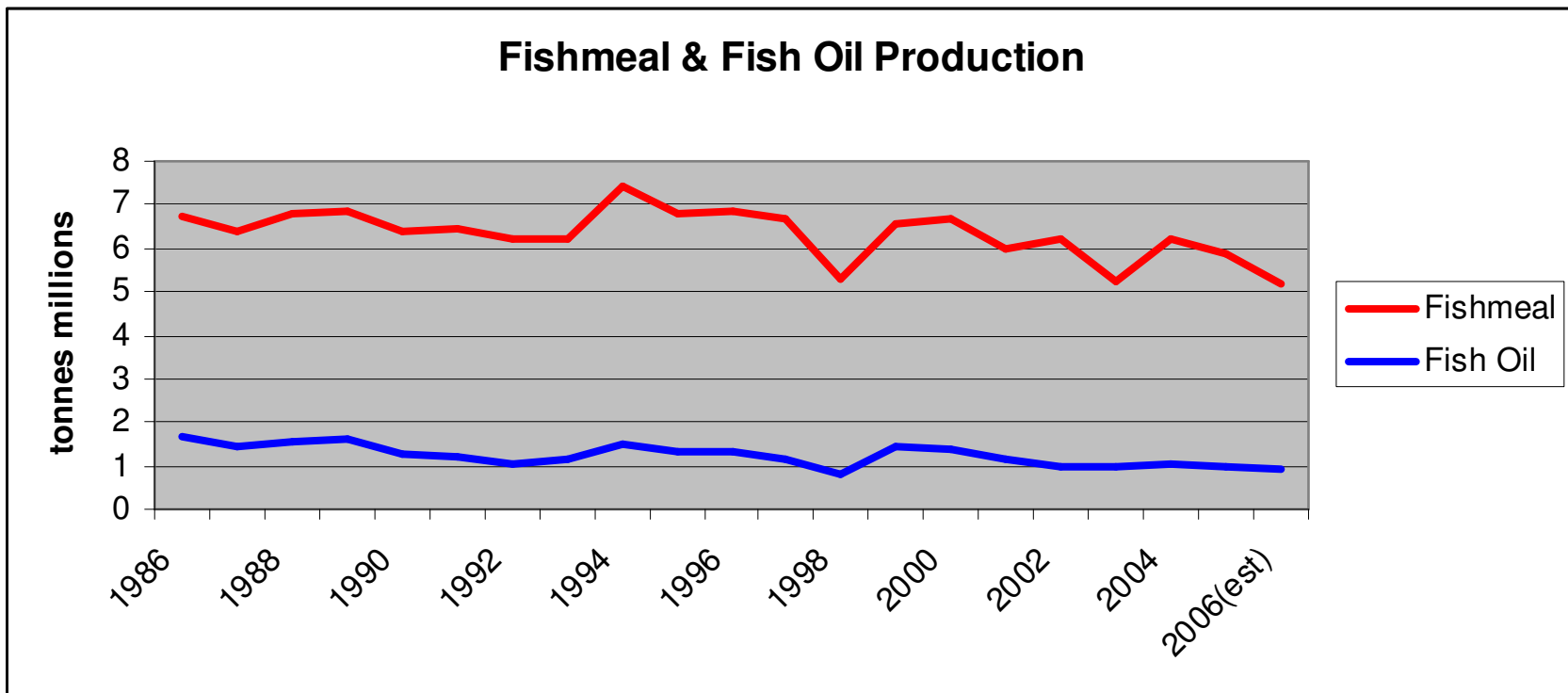
1950-1969 - Fish Oil extracted for production of margarines and soaps. Fishmeal more a by-product used for fertilizer & animal feed

1970-1989 - Fishmeal important feed ingredient in intensive animal production (poultry, cattle & pigs). Oil becomes more of a by-product often just used for fuel

1990-2009 - Fishmeal increasingly used in aquaculture diets and becoming a strategic ingredient for critical phases in the lifecycle of animal production due to its unique nutritional qualities. Fish Oil increasingly valued for its health and nutritional benefits to humans and animals



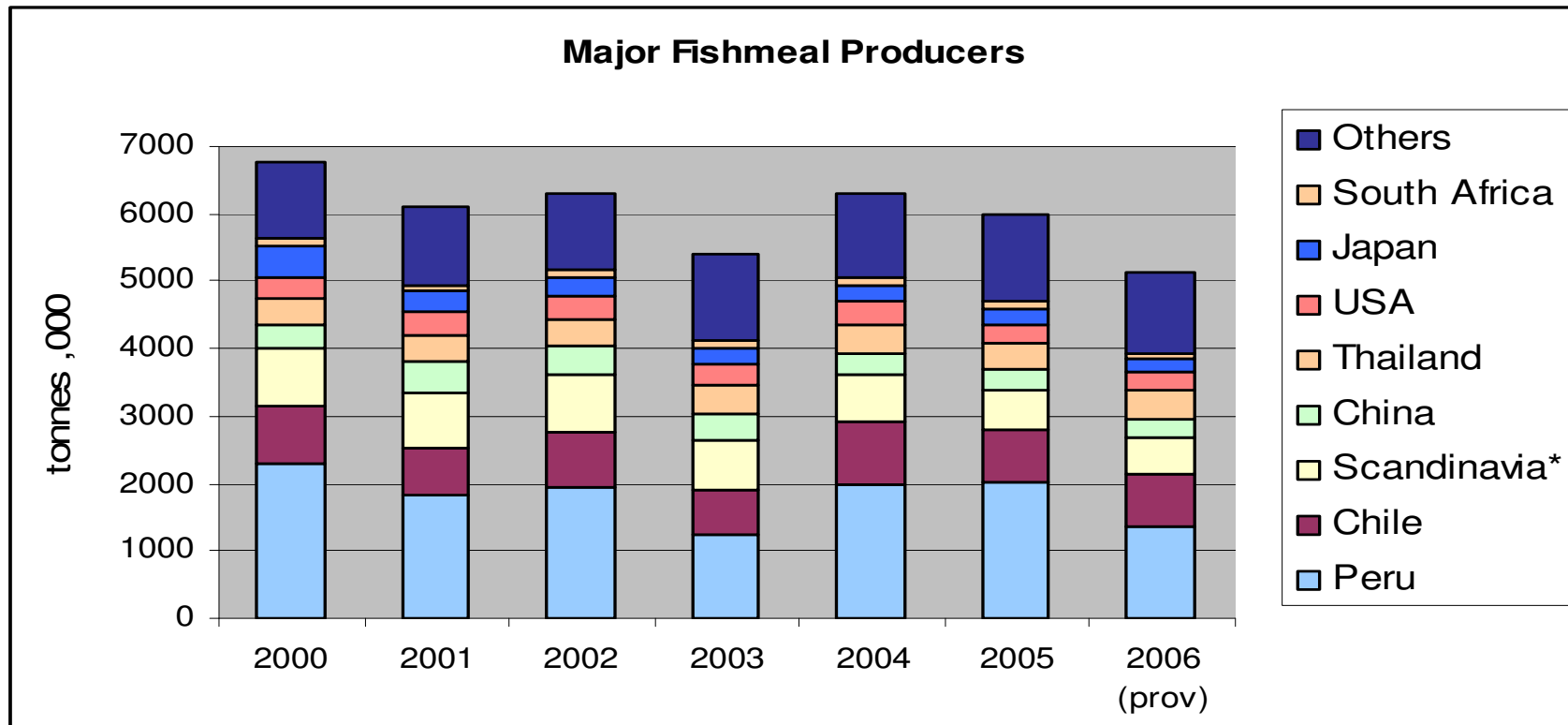
# Annual Fishmeal & Fish oil Production



**IFFO Data**



# Fishmeal Production by Country or Region

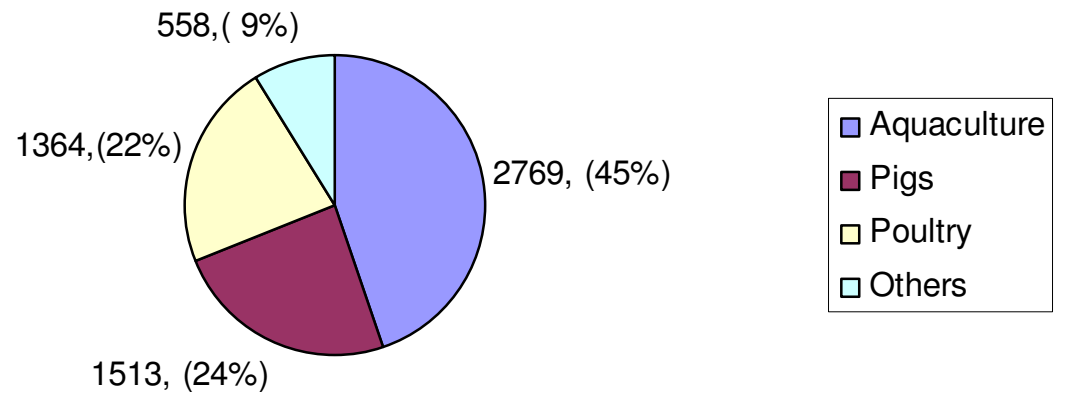


IFFO Data

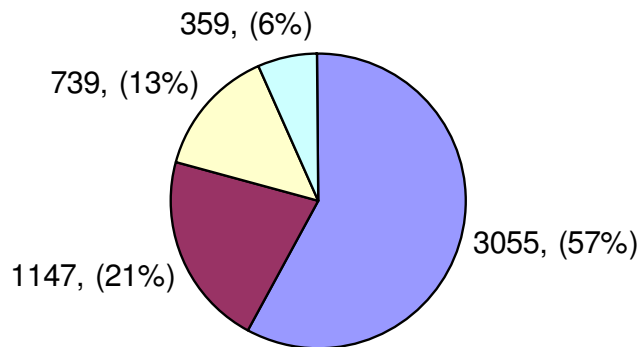


# Estimated Global Fishmeal Consumption

Fishmeal Consumption 2002 (tonnes ,000)

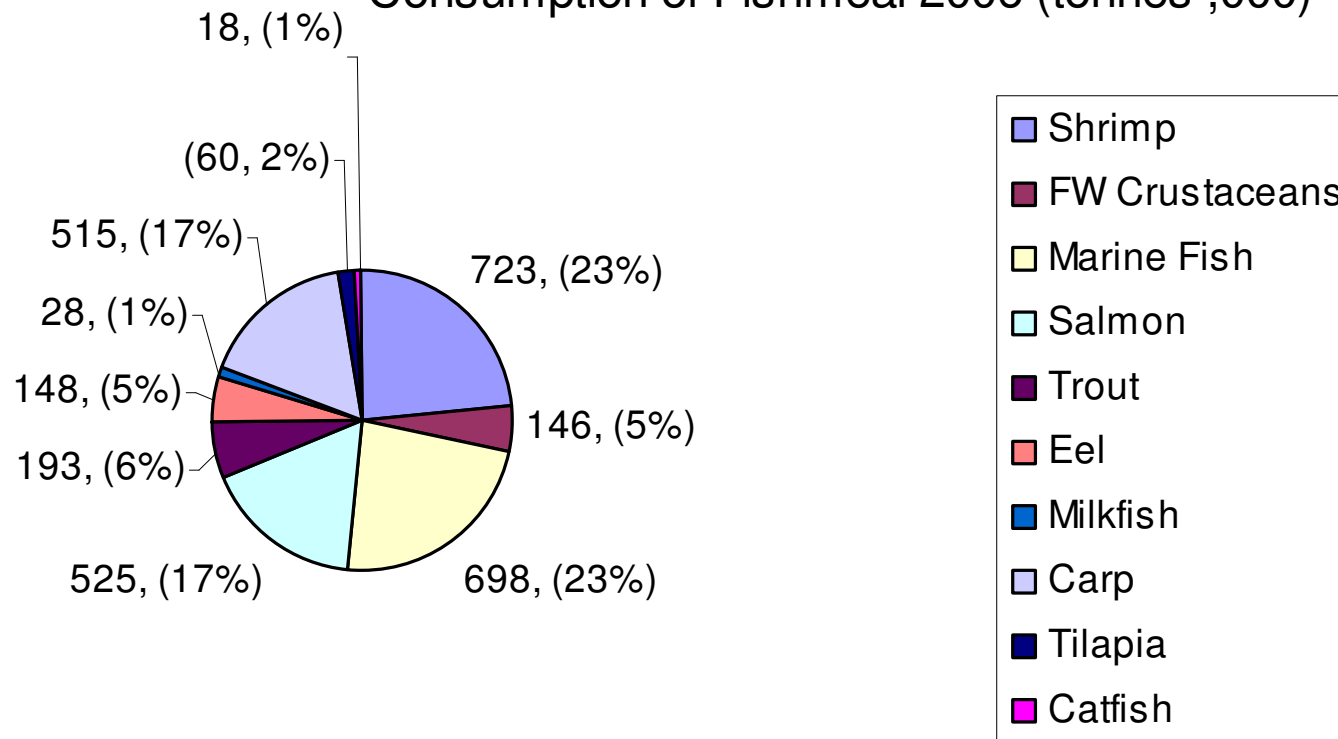


## Consumption of Fish Meal 2006



# Estimated Aquaculture Consumption

Consumption of Fishmeal 2006 (tonnes ,000)



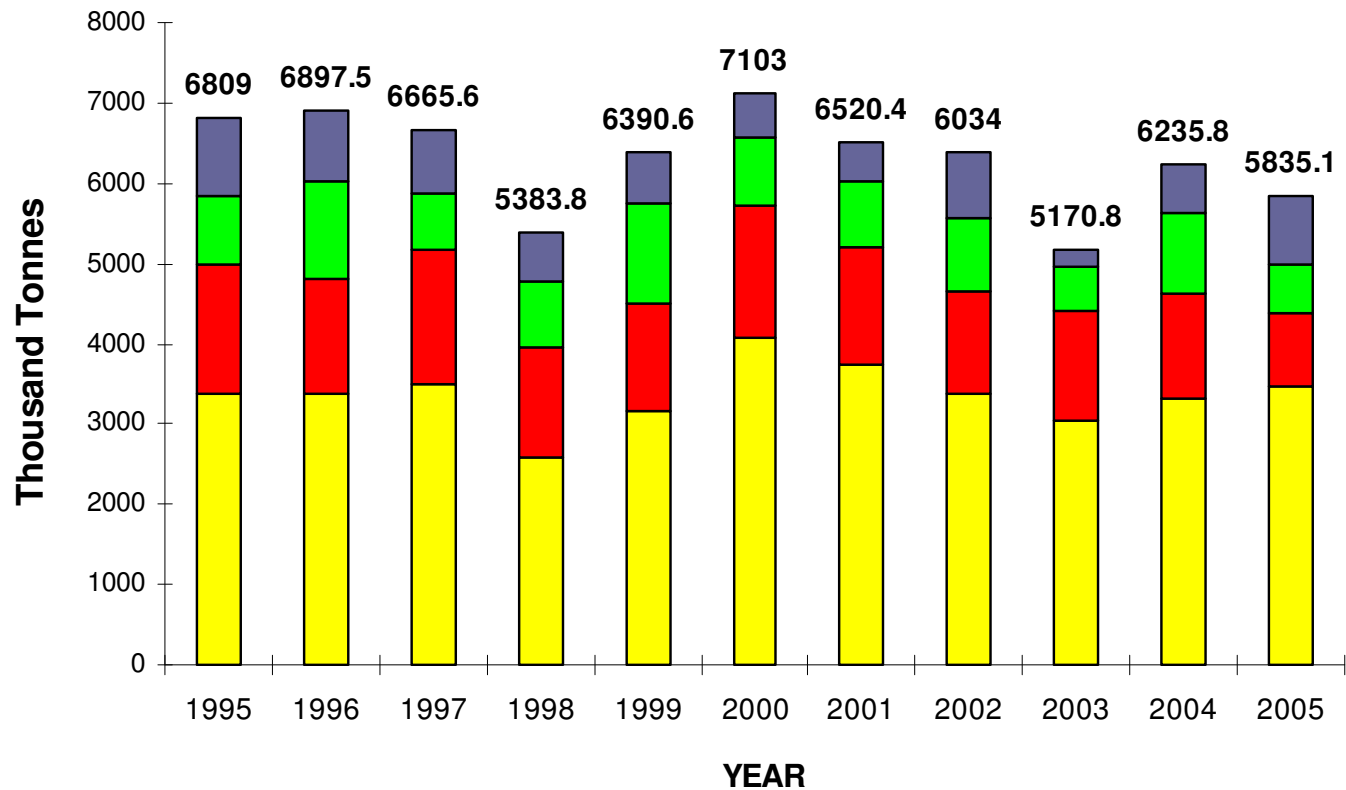
IFFO/FAO Data



# World Fishmeal Consumption

## WORLD FISH MEAL CONSUMPTION AND STOCKS

■ Far East    ■ Europe    ■ Americas    ■ All others







## Summary of trends in Fishmeal

- ✓ Production of fishmeal has remained relatively constant
- ✓ Approximately 40% of production comes from South America
- ✓ Aquaculture now represents over 50% of consumption
- ✓ South East Asia now represents over 50% of consumption
- ✓ Growing importance of Aquaculture & S.E. Asia



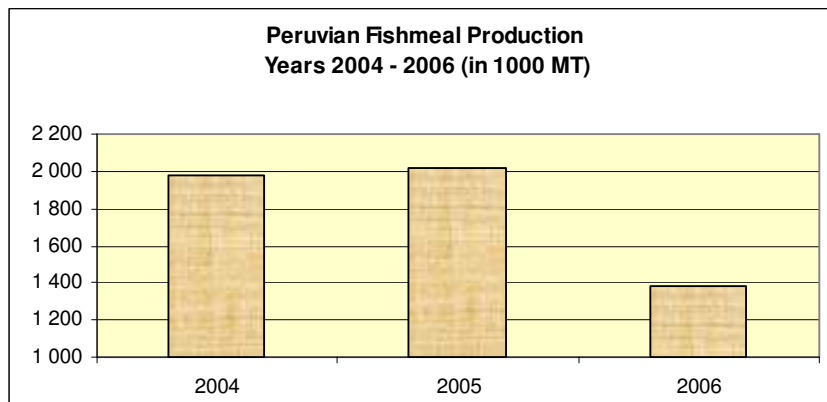
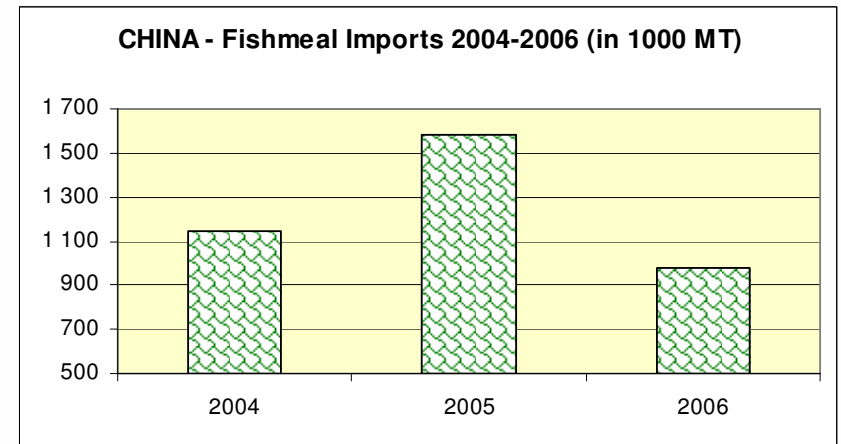
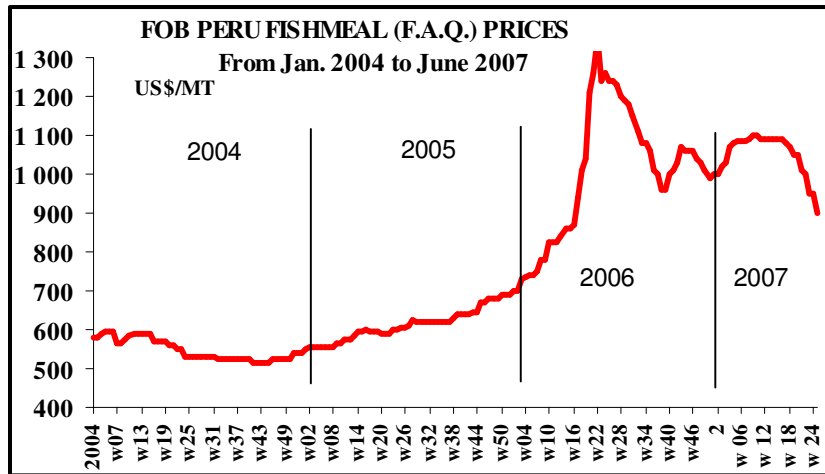


## Summary of trends in Fish Oil

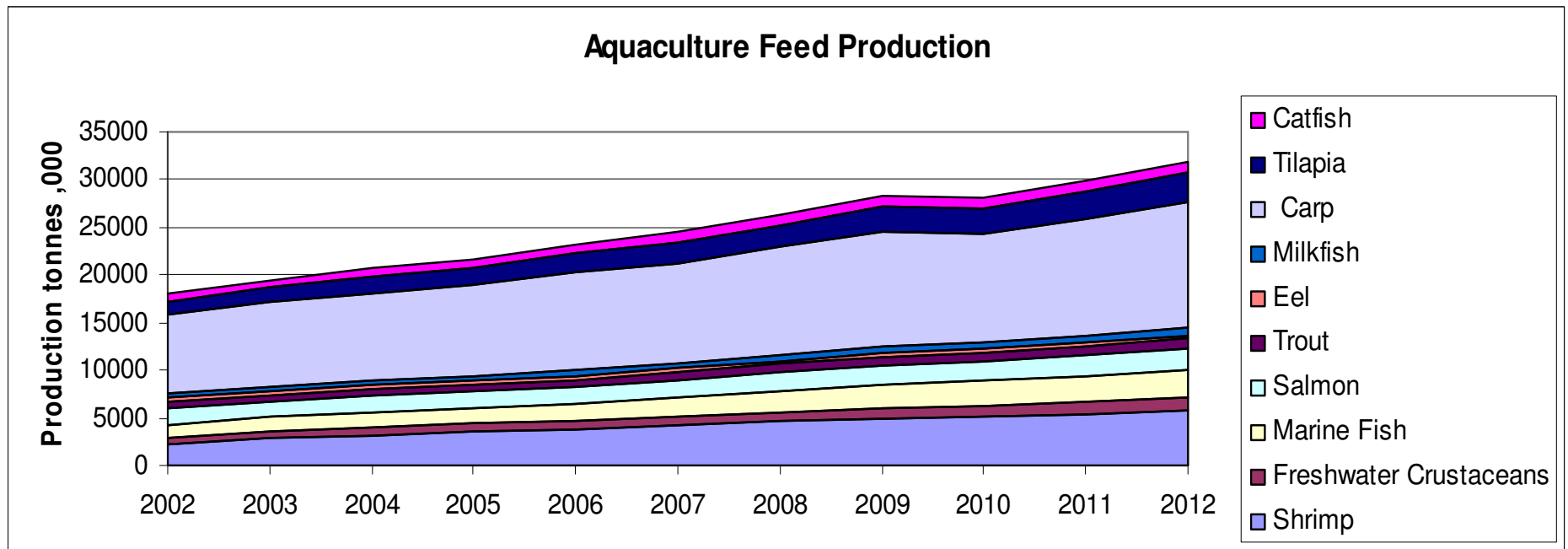
- ✓ Production of fish oil has remained relatively constant
- ✓ Approximately 40% of production comes from South America
- ✓ Aquaculture now represents over 80% of consumption
- ✓ Salmon now consumes nearly 40% of world production



# Fishmeal Price/Production/Consumption



# Fish Meal and Fish Oil will not limit aquaculture growth I Estimated Feed Production

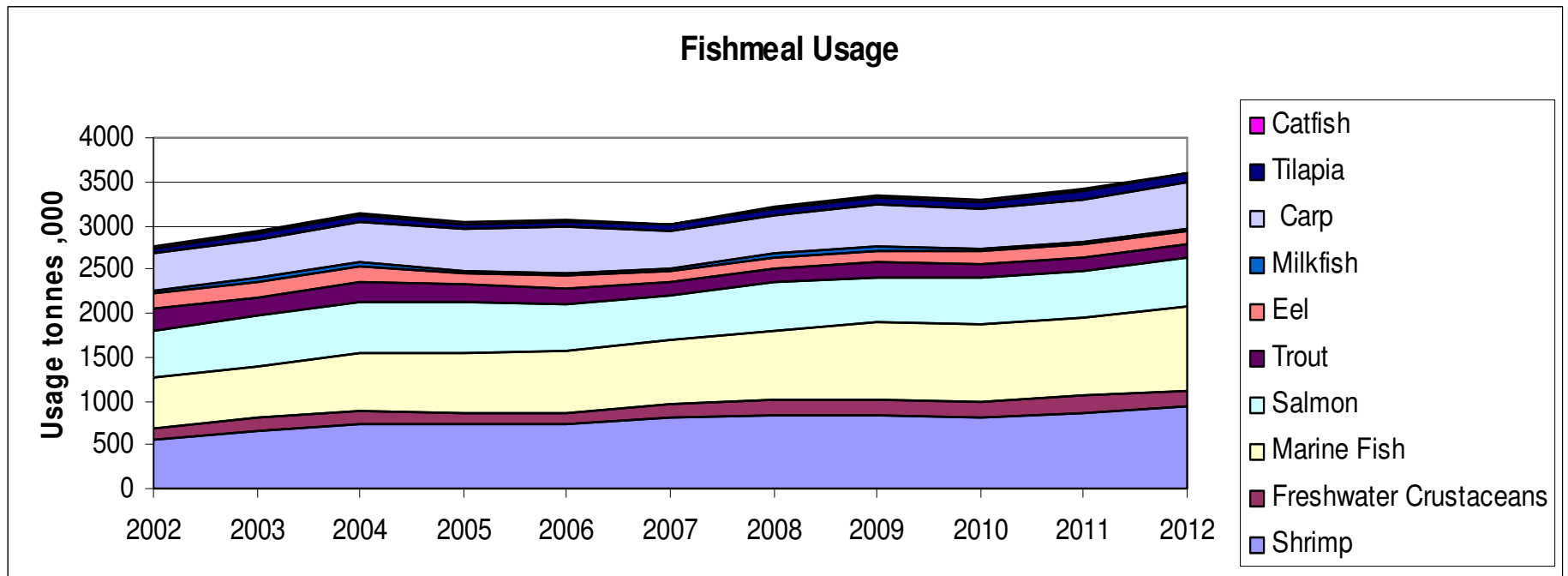


**FAO 2006**



# Fishmeal and Fish Oil will not limit aquaculture growth II

## Estimated Fishmeal Usage

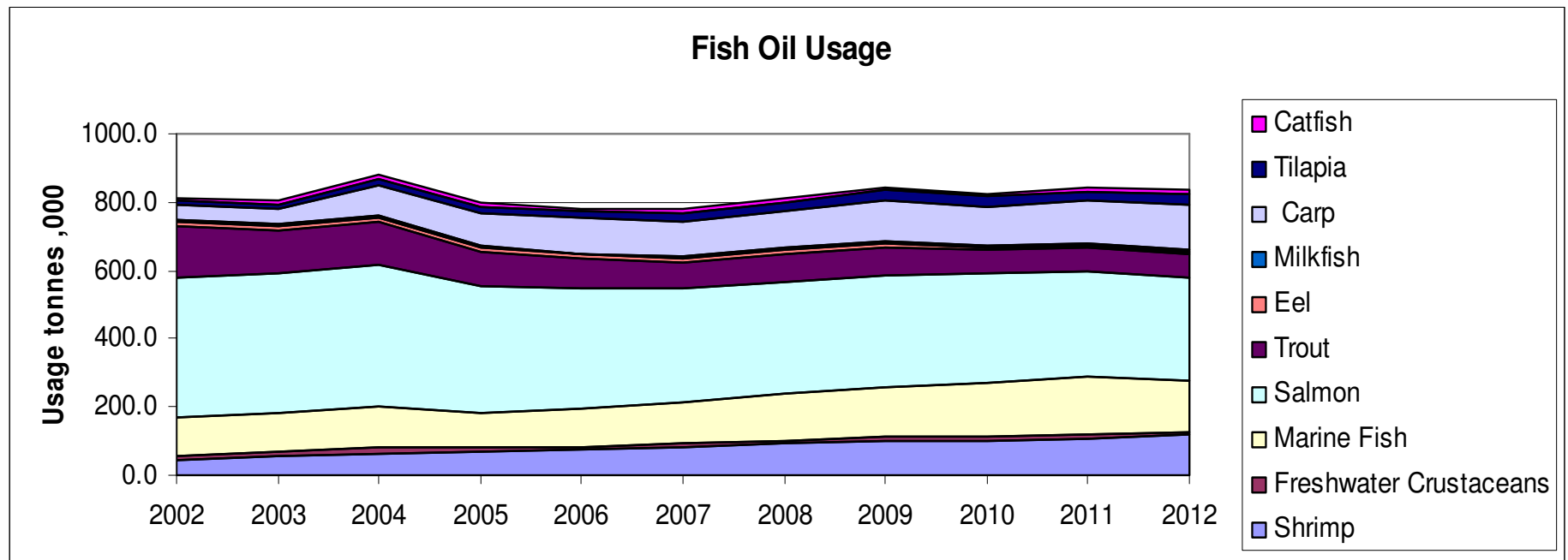


Based on FAO 2006 with IFFO data



# Fishmeal and Fish Oil will not limit aquaculture growth III

## Estimated Fish Oil Usage



Based on FAO 2006 with IFFO data

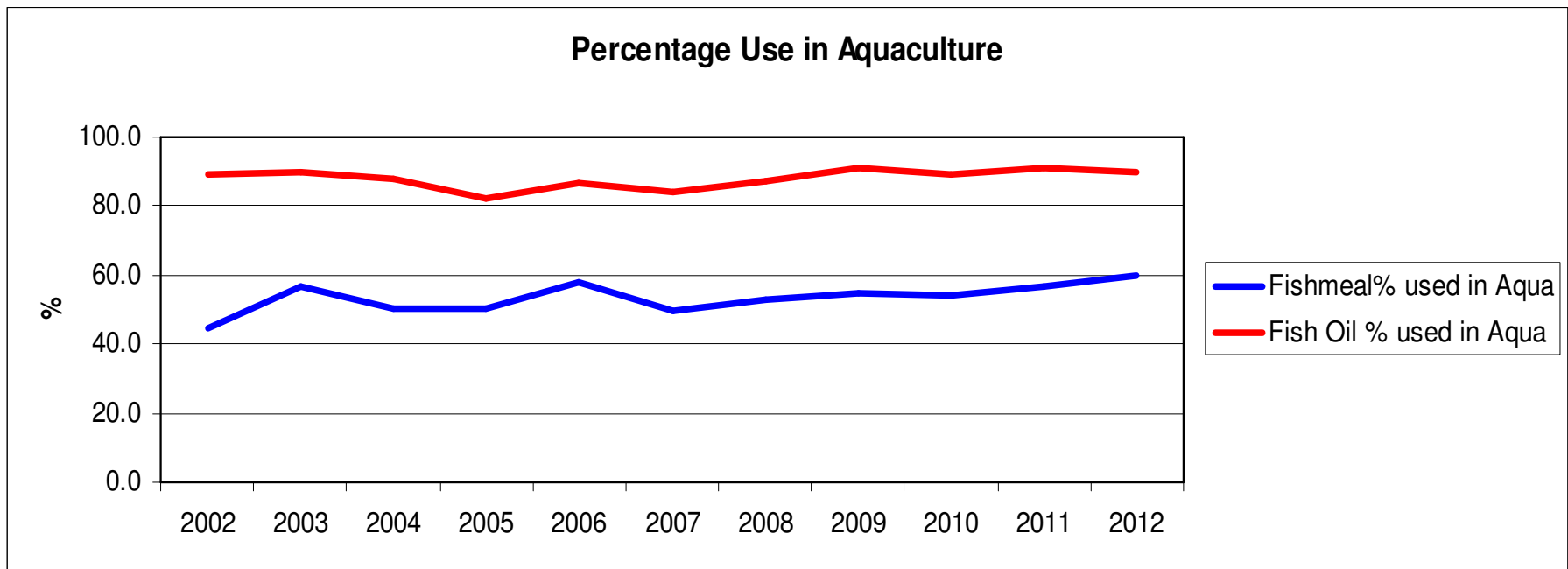


## Assumption of fishmeal inclusion %

	<b>2002</b>	<b>2006</b>	<b>2010</b>
<b>Shrimp</b>	<b>24</b>	<b>19</b>	<b>16</b>
<b>Marine Fish</b>	<b>41</b>	<b>38</b>	<b>34</b>
<b>Salmon</b>	<b>35</b>	<b>30</b>	<b>25</b>
<b>Eel</b>	<b>47</b>	<b>40</b>	<b>37</b>
<b>Tilapia</b>	<b>5</b>	<b>4</b>	<b>3</b>



# Fishmeal and Fish Oil will not limit aquaculture growth IV % Use of Global Production



Based on FAO 2006 with IFFO data







# **Most Feed Fisheries are being managed sustainably**

**The most obvious evidence is that output has remained relatively constant for decades**

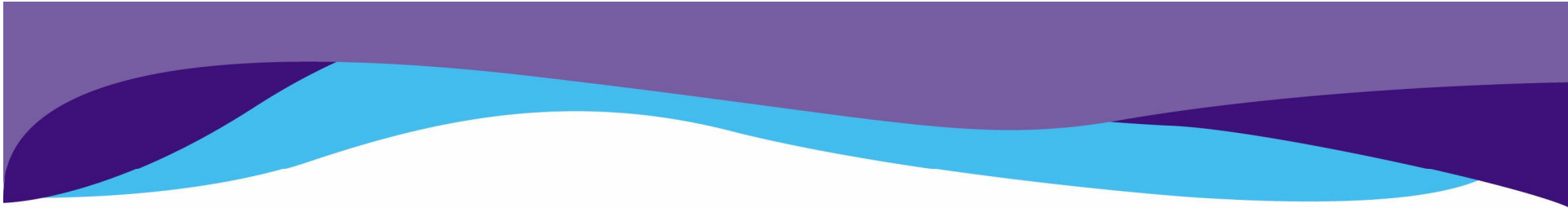
**The world's largest fishery in Peru contracts due to an El Niño every few years, but is managed back to give a Maximum Sustainable Yield**

**Unlike most fishing for human consumption, feed fish are mostly small bony almost inedible pelagic fish with a short life-cycle, therefore recovery is rapid**

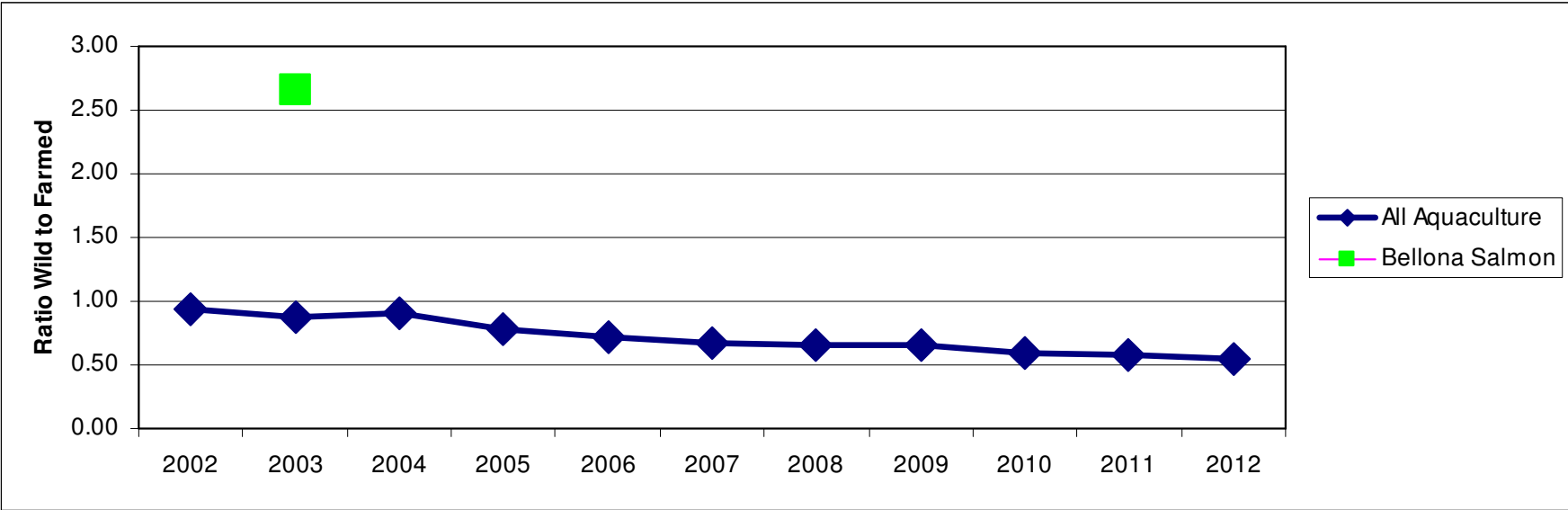
**Most major feed fisheries are controlled by TAC's, area catch limits, seasonal bans, min. mesh sizes, vessel registration satellite tracking and monitoring of all landings e.g. SGS in Peru**

**Mistakes have been made in the past, but improved stock knowledge and management controls have had a beneficial effect**





# Eco-efficiency wild to farmed

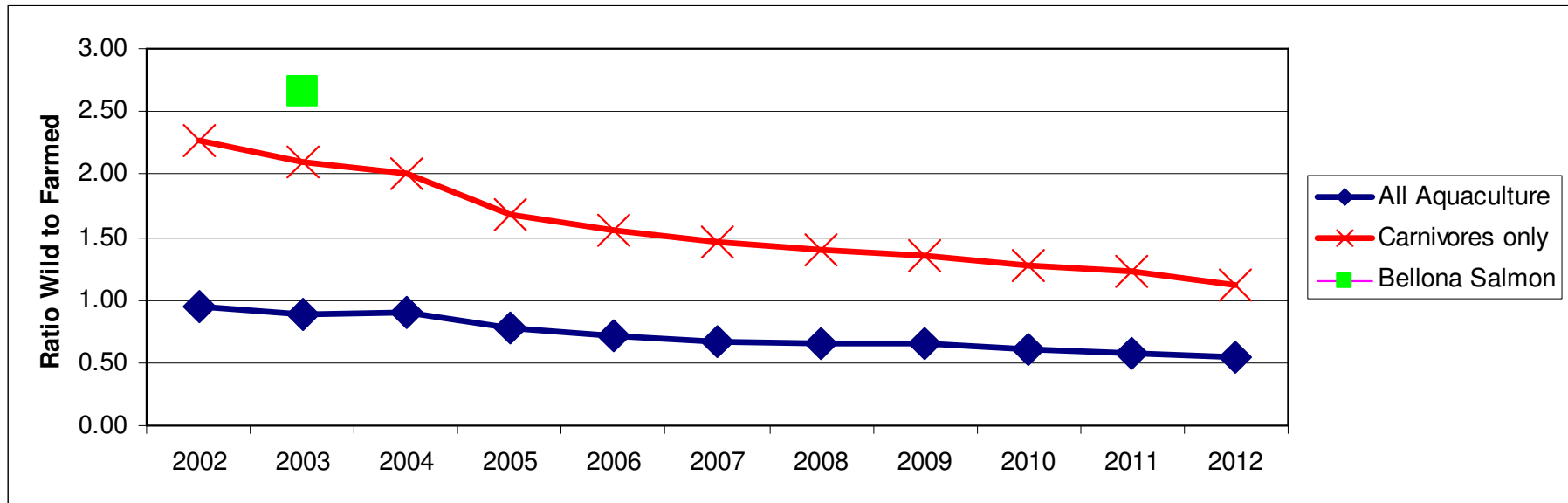


Based on FAO 2006 with IFFO data





## Eco-efficiency wild to farmed



Based on FAO 2006 with IFFO data





## **Optimal use of the Resource**

**An increasing amount of fishmeal is coming from fish processing by-products e.g. trimmings**

**There are increasing amounts of meal and oil being produced from aquaculture processing**

**The estimated 1.5 million tonnes of salmon harvested this year could yield around 30,000 tonnes of fishmeal and 20,000 tonnes of fish oil**

**All this further improves the eco-efficiency calculation**





## **New Resources – not many**

### **Discarded By-catch**

- **Many economic reasons for dumping of incidentally caught fish**
- **Recent estimates put the figure at 7.3 million tonnes worldwide (FAO 2005)**
- **Efforts are being made to reduce the figure and it has come down in recent years**
- **Catch should be minimised – should the remainder be made into fishmeal & fish oil ?**





## New Resources 2

### Trash Fish

- **Estimated 5-6 million tonnes of low value wet fish used in Asian aquaculture (Allan 2004)**
- **More efficient use if turned into meal & oil**

### Antarctic Krill

- **Biomass of 400-500 million tonnes**
- **Sustainable annual catch of 4-5 million tonnes**
- **This would yield 500,000-750,000 of meal**
- **Currently only about 100,000 tonnes harvested**
- **Aker Seafood Corp about to start increasing krill meal production, investing heavily**





## Factors Influencing Supply

- Regulations affecting fishing areas & quotas
- Natural Variation e.g. el Niño
- Fishing Effort
- Demand for direct human consumption
- Developments e.g. by-product utilisation, krill





## Factors Affecting Demand

- Price elasticity of demand
- Growth of aquaculture
- Growth of Chinese protein production
- Cost effective alternatives (including with new technology, biofuel etc)
- Growing appreciation of the role of EPA and DHA  $\Omega$ -3 fatty acids in human and animal nutrition
- Consumers' perception of the sustainability of fishmeal and fish oil





# Factors Influencing Demand

## Barriers to substitution

<b>Fishmeal +ves</b>	<b>Substitution -ves</b>
High protein- dietary space	High fibre
Almost perfect amino acid profile	Amino acid deficiencies
Residual health promoting oil	Perceived health risks - MBM
No anti-nutritional factors	Anti-nutritional factors & enzyme inhibition
High palatability & digestibility	Low palatability & digestibility
UGF & immunostimulants	Poor growth & survival
Perceived as entirely natural	GM issues and un-natural



# Changing role of fishmeal & fish oil

	2002	2006	2012
Poultry	Grower diets	Starter diets	Breeder diets & recovery diets
Pigs	Grower diets	Creep & Weaner diets	Breeder & recovery diets
Fish	High use in most diets	Moderate use in most diets	Starter, finisher, broodstock & recovery diets

**Commodity**



**Strategic Ingredient**

**Incr animal prod.**



**Decr FM inclusion**



**Constant FM prod.**



## Future implications

- ✓ Despite new resources total volumes of Fishmeal/Oil are likely to remain relatively constant
- ✓ As the cost of Fishmeal/Oil rises, so their inclusion level will decrease
- ✓ But Aquaculture is still growing strongly so that the total volumes fed to aquaculture will in future be higher than today while less will go to terrestrial agriculture
- ✓ Farmers have same overall feed cost but feeds deliver high performance and yield healthy livestock products with natural EPA and DHA
- ✓ Consumers can be confident they are being given safe and healthy products from a well managed sustainable source

