



The role of distribution chains in promoting the sustainable production and consumption of seafood products

SDG 14: Life below water

Ocean Forum, UNCTAD, Geneva, 22nd of March 2017, Andreas Stein



Structure:

- Intro: Sustainability is
- Seafood: Definition, Figures & Facts
- Stakeholders Seafood: NGOs/Businesses/Science
- Aquaculture feed
- Sustainability Development
- Conclusion



Intro: Sustainability is an old issue

Only after the last tree has been cut down /

Only after the last river has been poisoned /

Only after the last fish has been caught /

Then will you find that money cannot be eaten.

Augury Cree Indians



Intro: Sustainability is a present issue

„Replacer“

Antibiotica reduction

Local production

MSC

Governance

ASC

Society/
End consumer

Entrepreneur

FCR
improvement

FAO

UNCTAD

Animal Welfare/
Animal Health

Naturland

Fish By-prodcuts
for Petfood

Alternative energies

Co2 Footprint

Businesses

Greenpeace

GLOBAL G.A.P.

IFFO-RS

Traceability

Feed additives

Life cycle
assesment/Eco
balance

Eco-friendly

veterinary

WWF

ESF Eel

Quality Systems
(GMP, Q+S, Bio and others)

Innovative

organic

Stewardship

Science

Fund

Supporting eels, by
creating a trademark

Protection of
species

Feed raw materials

reliable

Resource-
efficient

Multipurpose use
in RAS: Fish and Plants

Breeding/Genetics/Management

More about it in Chapter: „Stakeholders Seafood/NGOs/Businesses/Science“

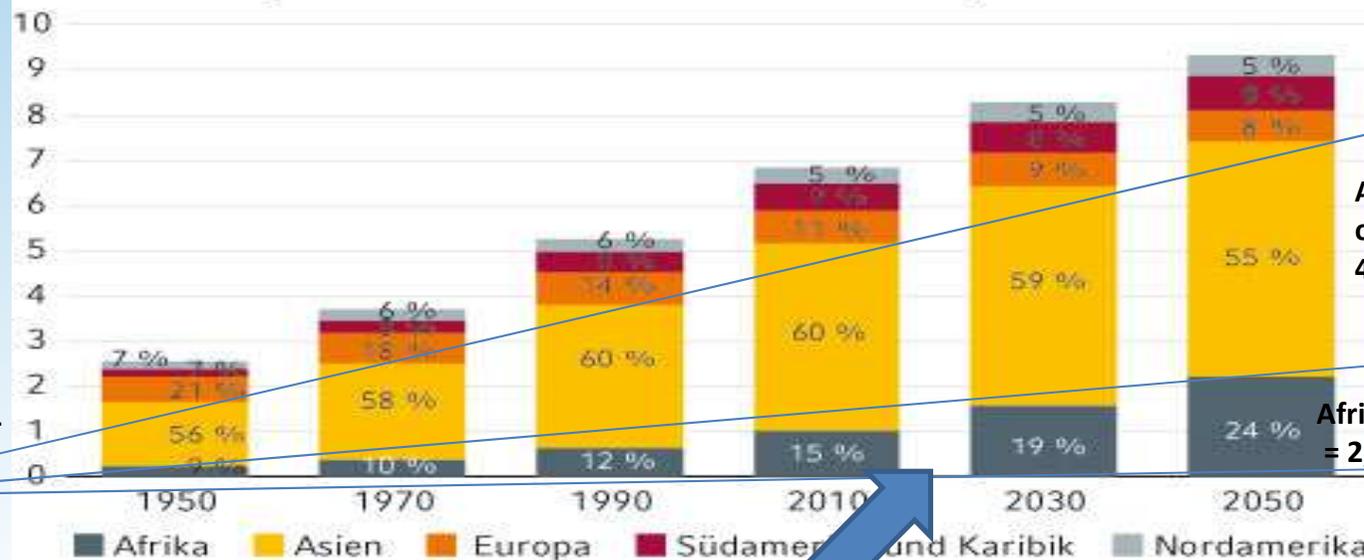


Intro: Sustainability is a future issue

Graph 3: Forecast of the world population between 1950 and 2050 (sorted by region); in billion and percentage by region

Grafik 3: Prognose zur Weltbevölkerung zwischen 1950 und 2050 (nach Regionen)

Weltbevölkerung in Milliarden und relativer Anteil nach Region:



Stand: November 2012; Quelle: United States Census Bureau, Commerzbank Corporates & Markets

Europe: 21% of 2,5 bn. = 0,525 bn. people

Asia: 56% of 2,5 bn. = 1,4 bn. people

Europe: 8% of 9 bn. = 0,72 bn. people

Asia: 55% of 9 bn. = 4,95 bn. people

Africa: 24% of 9 bn. = 2,16 bn. people

Small-scale fisheries, fishing and –farming, abt. 37 Mio people, 90% are in Asia. Additional 100 Mio. people are employed in assooiated activities.



Intro: Sustainability is a future issue

GROWING NEED FOR PROTEIN

The global need for food is growing, and the need for protein is expected to increase by 70 per cent worldwide by 2050. We believe that farmed seafood offers one crucial solution to meeting this demand. Fish is the most resource-efficient animal protein available to humans, aside from insects.

source: Ewos



Seafood Definition:

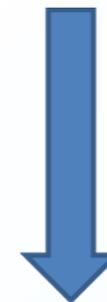
Capture Fisheries

and

Aquaculture



abt. **1kg** Growth = **10kgs** "Feed intake"
Sea and Land



FAO:
578 species
Aquaculture
(Fish, Mussels,
Crustaceans,
Algae, and so on)

abt. **1kg** Growth (BM) = **1kg** Feed intake
Land and Sea



FCR in comparison:

Cattle ca. 1:5

Pig ca. 1:3

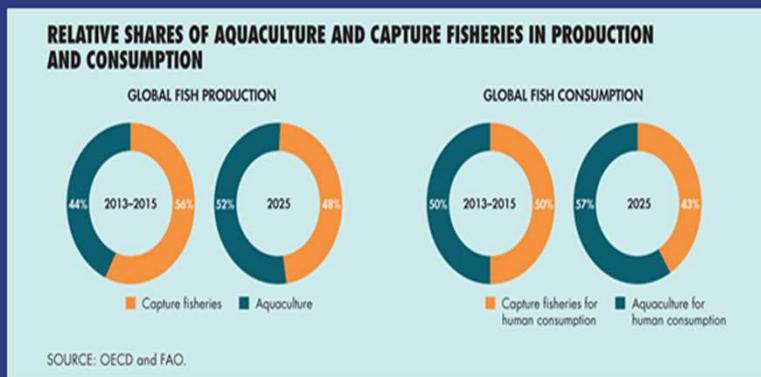
Broiler ca. 1:1,6

Source: Feap Introduction „Fifo- Fish in fish out“

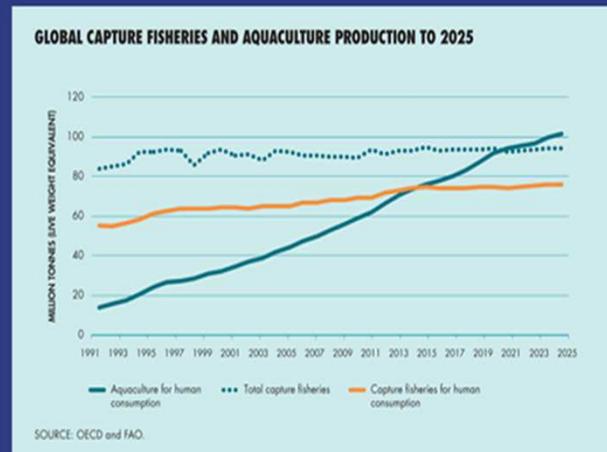


Seafood: Figures & Facts

Fisheries Production and Consumption



Fisheries Production for Human Consumption



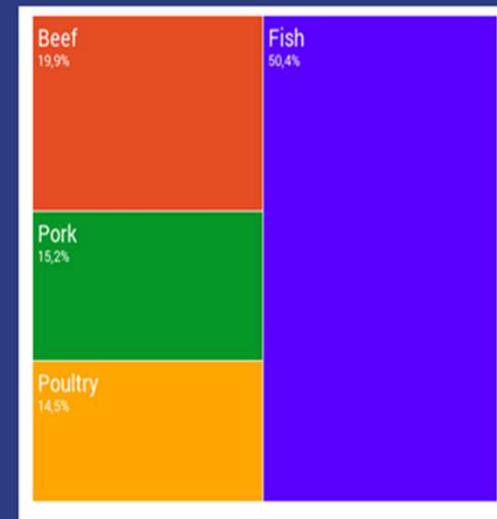


World market Seafood: Who and what?

Fisheries – Production and Trade



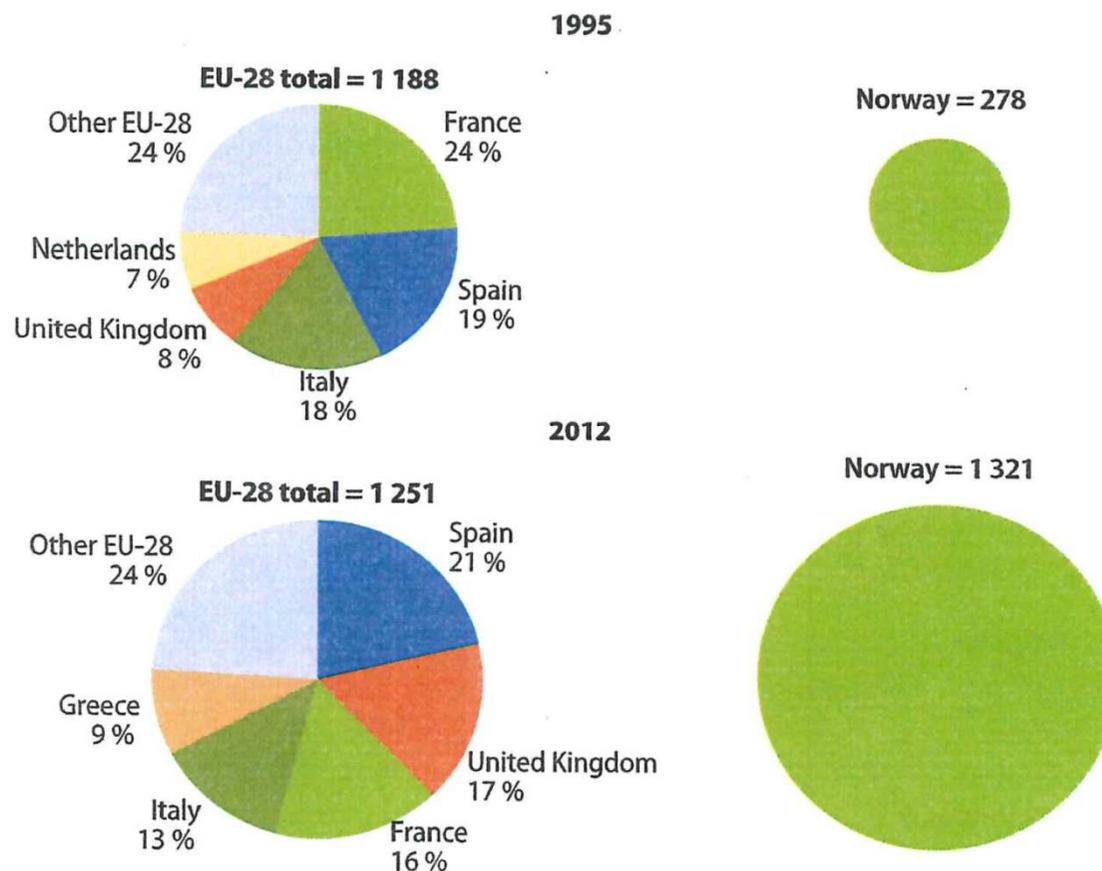
Fish, International Trade and Other Animal Proteins



In Value Terms

World market Aquaculture: Europe

Figure 7.1: Main aquaculture producers ⁽¹⁾, EU-28 and Norway, 1995 and 2012
(1 000 tonnes live weight, %)



⁽¹⁾ Excluding production from hatcheries and nurseries, fish eggs for human consumption, ornamental and aquarium species.

Source: Eurostat (online data codes: [fish_aq_q](#) and [fish_aq_2a](#))

Aquaculture/Fish: Germany

Aquakultur in Deutschland - wer macht was?

Betriebsform	Anzahl Betriebe	Erzeugte Menge (t)
	3300	26 900 t
Telohé (Karpfen)	2100	5 600
Becken, Fließkanäle, Forellentelohé	1400	10 500
Kreislaufanlagen	55	2 800
Netzgehege	20	85
Meerwasser (MUSCHELN)	11	8 000



Anzahl Betriebe und erzeugte Menge Fisch in Süßwasser nach Aquakulturstatistik in 2015 in Deutschland (www.destatis.de)

3 300 Aquakulturbetriebe 2015
18 500 t Fische
8 000 t Muscheln

2015 wurden in Deutschland
1,15 Mio. t Fisch und Seafood
verzehrt (FIZ, 2016)

87 % wird importiert!





Aquaculture/Fish: Germany

Seafood/Fish inland capture in total:	42,400tons	100%
Aquaculture:	21,000tons	49.5%
Share Freshwater fishing*:	21,400tons*	50.5%*

*Breakdown Freshwater fishing in total:	21,400tons	100%
Fisheries (around 900 Fisherman, mainly SSF):	3,000tons	14%
Sportfishing (around 1.8Mio licenses):	18,400tons	86%

Source: Jahresbericht zur deutschen Binnenfischerei und Binnenaquakultur 2015



Aquaculture/Fish: Codfish current situation

March 2017: Capture is stopped in the Baltic Sea for min. 8 weeks

1. Fisheries suffer losses
2. Compensation is hard to survive
3. Change is expected from Fisheries to Small Scale Fisheries



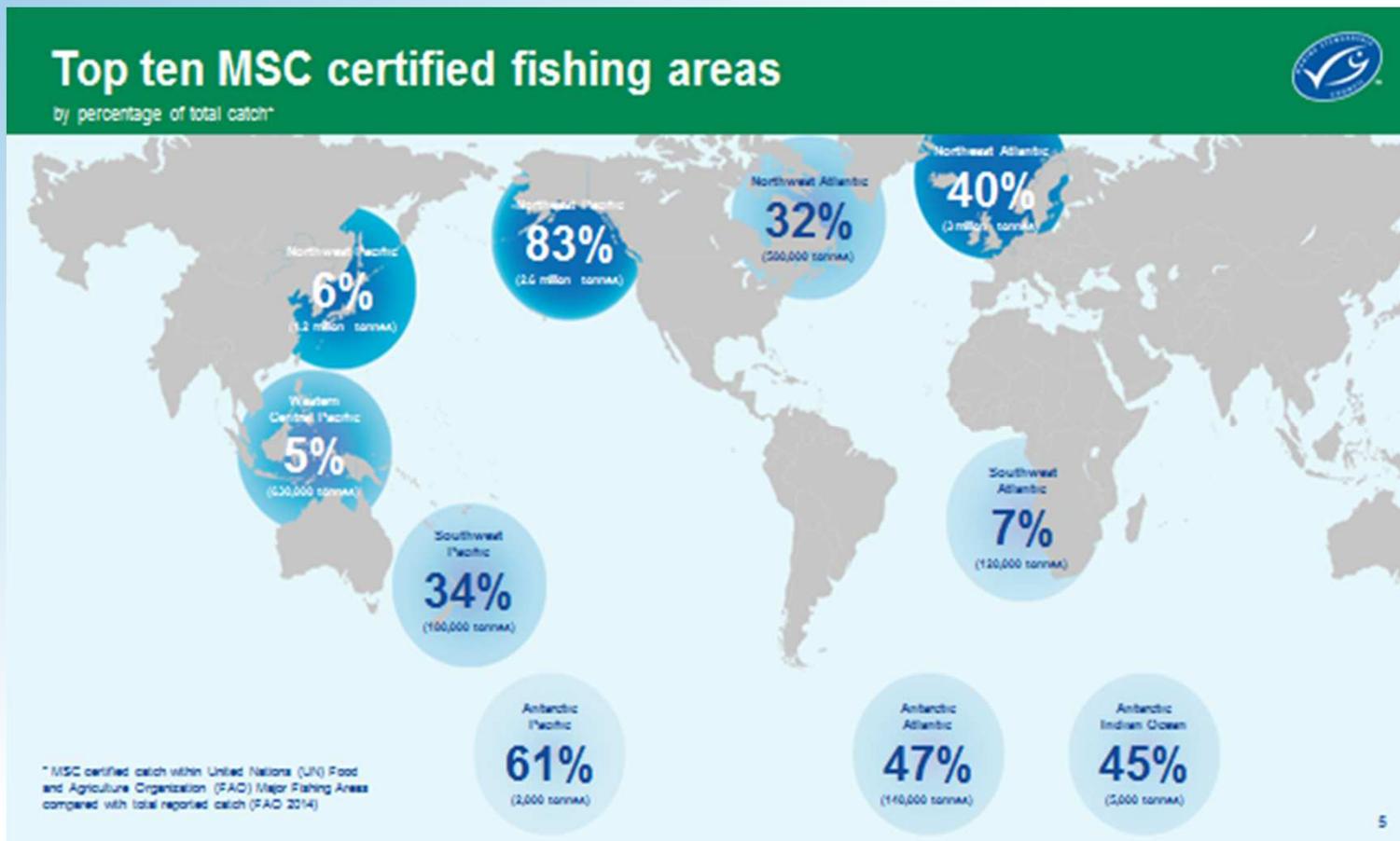
Stakeholders Seafood: NGOs/Businesses/Science

Following stakeholders are just examples for the Seafood-Industry:

- MSC, ASC, GLOBAL G.A.P., PSPA
- EW Nutrition GmbH, Leiber GmbH, Miavit, Biomin, Euroduna Group
- Aller Aqua/Biomar/Ewos/Skretting/Coppens
- Deutsche See
- Christian Albrecht University (CAU)/GMA



Stakeholders Seafood NGO: MSC



Stakeholders Seafood NGO: ASC

ASC 5 years after first farm certified:
More than 400 farms certified around the globe



ASC at farm level



- ✓ **428** certified farms in **37** countries (all continents)
- ✓ **1.097.201** metric tonnes – 3-4% of global volume (of these species)
- ✓ **Salmon** and **shrimp** growing the fastest

ASC in the supply chain



- ✓ Same Chain of Custody Standard as MSC
- ✓ **1,126** certified partners in supply chain

ASC labeled products



- ✓ **7,348** approved products in **58** countries globally
- ✓ Central & Northern Europe leading
- ✓ Other markets emerging (France, Asia)

Data: ASC, February 2017



Stakeholders Seafood NGO: GLOBAL G.A.P.

GLOBALG.A.P. Aquaculture Certification system
The full production chain shall be verified



FEED
Food safety,
sustainable
sourcing

SEEDLINGS
Ova,
juveniles

FARMING
Finfish,
Crustaceans,
Molluscs

CHAIN OF CUSTODY
Animal welfare, proper
segregation.



Food Safety

Animal Welfare

Traceability

Environment

Workers Welfare

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Stakeholders Seafood NGO: Naturland



Naturland AQUACULTURE

- ✓ Strict, detailed standards
- ✓ Transparent procedures
- ✓ Effective systems
- ✓ Clear added value
- ✓ Credible communication

Naturland WILDFISH

- Capture Fishery Certification

- ✓ Focus on artisanal fisheries, widely neglected by other fishery certification schemes
- ✓ Strong social component in the standards (*a global novelty!*)
- ✓ Unique combination of 3rd-party certified, sustainable fishery, social standards, and organic processing



Stakeholders Seafood NGO: PSPA

Alaska Salmon
Wild, Natural, Sustainable



Glenn Reed, President
Pacific Seafood Processors Association

SUSTAINABILITY MANDATE

Salmon sustainability is inherent in Alaska's governance system.

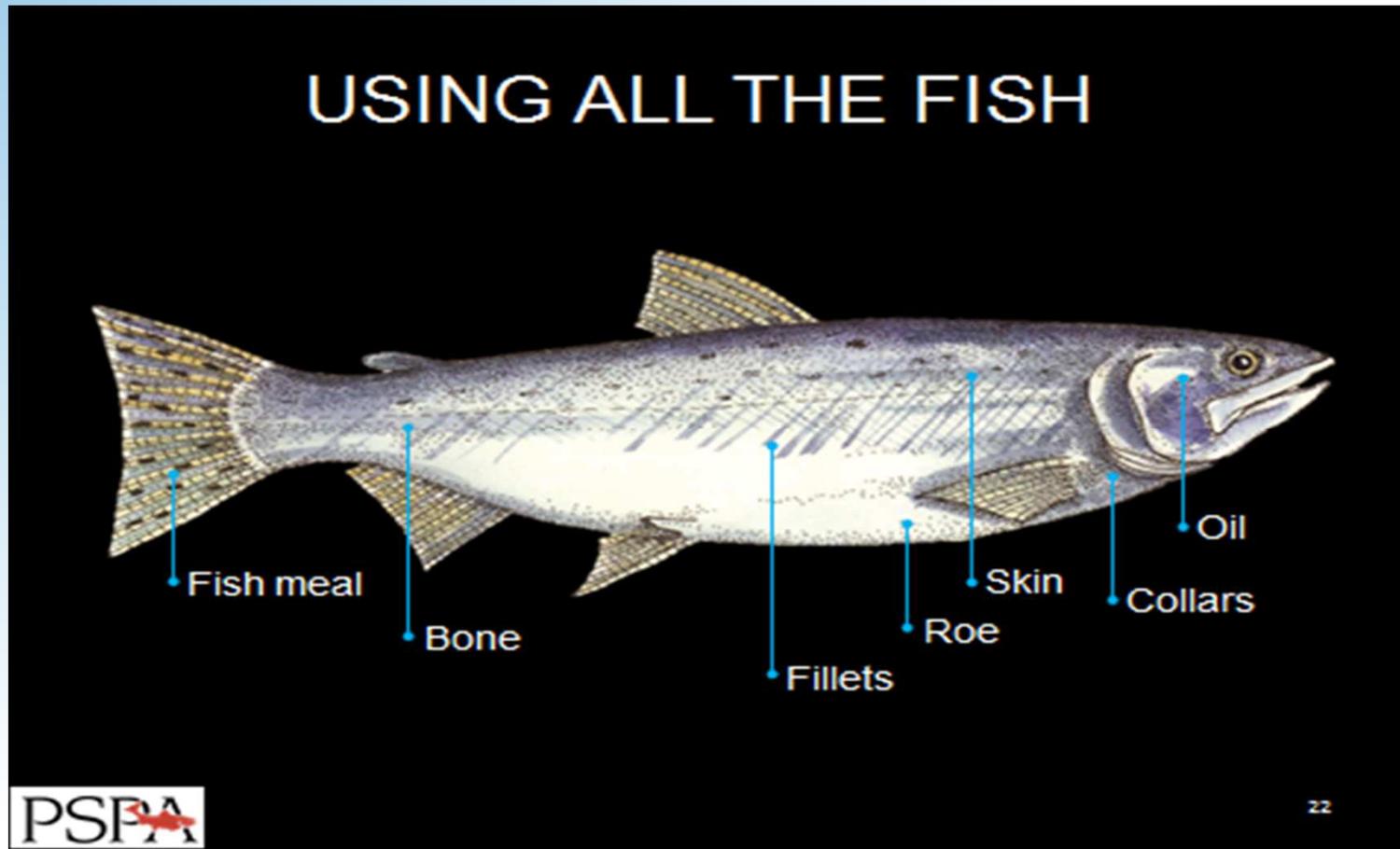
State of Alaska Constitutional mandate (1959):

"Fish...shall be utilized, developed, and maintained on the sustained yield principle..."





Stakeholders Seafood NGO: PSPA



A good example of SUSTAINABILTY



Stakeholders Seafood: Feed „EW Nutrition GmbH“

Conclusion

Activo® Aqua

- leads to improved performance parameters
- reduces the use of antibiotic growth promoters
- enhances the profitability of our customers



Support Higher
Survival Rate

Improved Body
Weight Gain

Improved Feed
Conversion Rate

Higher Profit





Stakeholders Seafood: Feed „Leiber GmbH“

Isolated from yeast cell walls,
cereals, algae, bacteria, fungi

Chains of β -1,3-linked D-glucose
monomers; linear, or branched with
 β -1,6- linked side chains



Immune modulating
effects proven in aquatic
organisms, livestock,
companion animals and
humans

Highly purified β -glucans

Prophylactically boosting immune competence





EURODUNA

Stakeholders Seafood: Feed „Miavit GmbH“

2/2

Overview about feedstuffs and additives:

Pro-biotics:

Stimulating lactic production, consuming oxygen

Product ranges: different lactic acids forming bacteria, Special bacterial strains (B. subtilis, P. E. facium) and live yeast

Commercial products: Bactocell, Calsporin, Bioplus 2B, Levucell

Enzymes:

Enhancing digestibility of phosphorous and NSP

Product ranges: Fytase, NSP enzymes

Commercial products: Ronozyme, Phyzyme, Xylanase

! Mycotoxin binders:

- Binding and disabling mycotoxins

Product ranges: Binders (bentonite, zeolite, and diatomaceous earth), Yeast cell walls

Commercial products: MiaBond (Trophy), Mycofix, Tox-Aid

! Omega 3 :

- Delivering omega 3 fatty acids

Product ranges: algae, fungae and oils (salmon oil, rapeseed oil with EA and DHA)

Commercial products: DHAgold, Salmon oil (farmed)

What are mycotoxins?



Fusarium sp.



Aspergillus sp.



Penicillium sp.



Alternaria sp.



Claviceps sp., etc.

- secondary metabolites produced by fungi
- produced under favourable environmental conditions...
- on almost all agricultural commodities worldwide!
- > 400 mycotoxins identified
- chemically stable
- resistant against temperature
- resist storage
- resist processing conditions

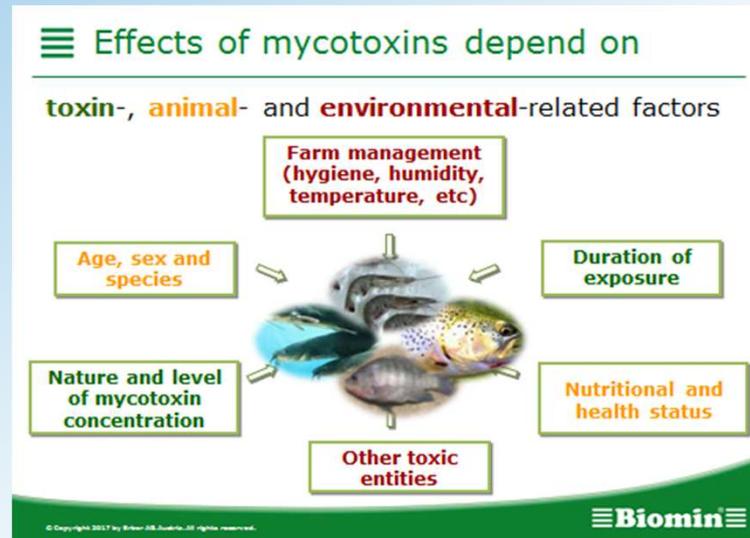
BIOMIN Mycotoxin Survey 2016



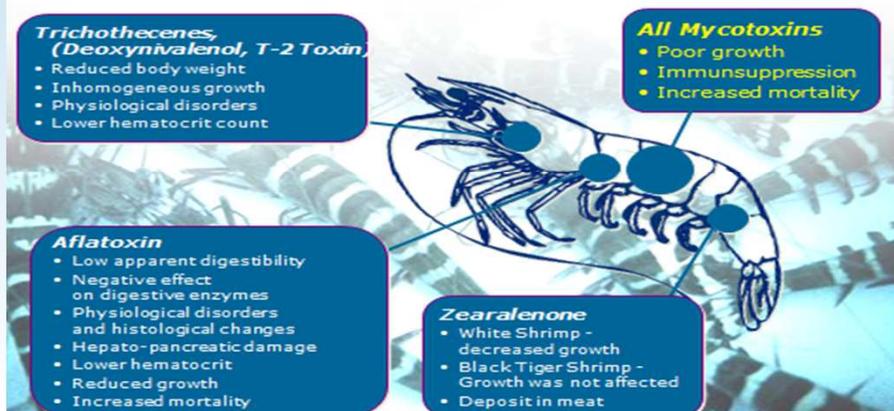
Covers 8271 samples, 75 countries. 1st survey in 2004.



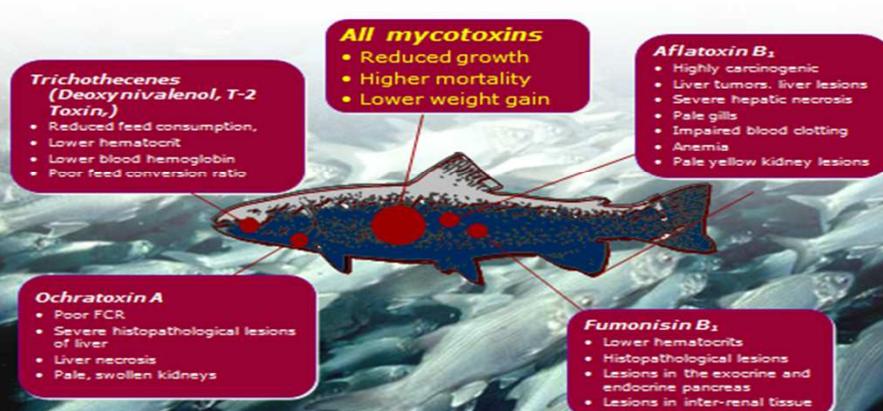
Stakeholders Seafood: Feed „Biomin“



≡ Effects of Mycotoxins



≡ Effects of Mycotoxins





Stakeholders Seafood: Feed „Euroduna Group“

Ingredients for fish feed

Everything from fish
Fishmeal
Fish oil

Everything from pig
Hemoglobin powder
Plasma powder
Blood meal (spray-dried)
Blood meal (ring drier or disc drier)
Greaves
Meat & bone Meal

Everything from poultry
Poultry blood meal
Poultry meal
Poultry meat bone meal

Vegetable origin
All common plant proteins
(Soy, Wheat, Corn etc.)

Others
Minerals (mineral mix)
Vitamins (vitamin mix)

Nutrition	Content %
Water	≤12.5
Crude protein	≥40
Crude fat	6-9
Crude fibre	≤3
Crude Ash	≤14
Lysine	≥2.5
Sulfur-containing amino acid	≥1.5
Total phosphorus	≥10
Total Energy(MJ/Kg)	≥16.0

**Example:
Nutritional
Requirements of
Tilapia Fingerlings**

Certifications:
  

Certificate No.: 260613143
Marine Stewardship Council Reg. No.: MSC-C-54625
Organic Registration No. (EU VO 834/2007): D-SH-006-19270-CE-DE-ÖKO-006

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EURODUNA TECHNOLOGIES GMBH

And.....

Eurodunas important role:

Providing the
Aquaculture industry and
Petfood industry with
by-products from Fish
processing industry



Overview of New Products from Euroduna

- Duna YPC 55C & Duna YPC 55F
- Lecithine
- Inositol
- Organic bound traceminerals
- Chia-seeds
- Insectprotein und -oil



EURODUNA

Stakeholders Seafood: Fishfeedproducers

- Skretting
- Ewos
- Biomar
- Aller Aqua
- Coppens
- and others in Asia, ROW



Stakeholders Seafood: Fishfeedproducers

Abstract ALLER AQUA Sustainability Statements

Sustainability is an integrated part of Aller Aqua. We know that modern fish farming has the highest requirements when it comes to reducing environmental impact.

We reduce environmental impact by choosing only raw materials with sustainable origin. Further, feeds are formulated for highest efficiency and nutrient digestibility resulting in low nutrient discharge to the water.

- All raw materials are purchased from certified suppliers following international quality standards (e.g. ISO, HACCP or GMP+).
- All raw materials are non-GMO.
- Local raw materials are prioritized.
- All soy products are certified regarding to responsible farming (e.g. RTRS, ProTerra or ISCC).
- Wild captured fish used to produce fishmeal and fish oil come from healthy fish stocks and do not originate from endangered species. Certifications ensuring sustainability are e.g. MSC/ISEAL or IFFO-RS.
- By-products (trimmings) from fish processing plants, which are acknowledged as a sustainable source of marine raw materials, are used as a regular marine raw material.
- Undesirable substances are under strict surveillance.



Stakeholders Seafood: „Deutsche See“

Sustainable Fishing Policy

Our Company, our People

- 1.700 employees across Germany, ranging from distributors /drivers to managers, smoking chefs and subsidiary directors
- Wide-ranging expertise in the field of fish and seafood
- Long-term experience in throughout the process, from the fishing source to the distribution to customers
- Sustainability as a primary concern
- Directed by entrepreneurs
- Abides by high social standards; collective wage agreement
- Greets around 2000 visitors each year (Customers, Media, Politics)



Stakeholders Seafood: „Deutsche See“

Products and assortment

- Constant surveillance of the species in terms of resources and protection of the species
- Cancelling fishing of very endangered populations (e.g. Red Tuna)
- Removing polluted fish from the assortment (e.g. Scorpionfish, red snapper)
- Analyzing and assessing polluted fish-species by on-site inspections (e.g. Swordfish from the Indian Ocean)
- Supporting Social-projects

=> Deutsche See faces challenges and consequently implements new policies and sets a standard for the entire Fishprocessing industry



Stakeholders Seafood: „Deutsche See“

Deutsche See is „strictly living Sustainability“: How?

Handelsblatt

FOLGEN DES ABGASSKANDALS

Deutsche See verklagt VW

Datum: 05.02.2017 14:29 Uhr • Update: 05.02.2017, 17:41 Uhr

Jetzt bekommt VW im Abgasskandal auch erstmals mit einem Großkunden Ärger vor Gericht. Der Fischverarbeiter Deutsche See will Schadenersatz für die Dieselmanipulationen. Hunderte Privatkunden klagen bereits.



Deutsche See will gegen VW klagen
Nicht nachhaltig genug: Die Deutsche See ist mit dem Lieferanten VW unzufrieden.
(Foto: dpa)

Deutsche See is bring in an action against VW (Volkswagen AG) and claims a compensation of about 12 Mio. €. Reason is the manipulation of exhaust emissions in 500 company cars.

„ We are very disappointed and feel ourselves cheated and betrayed. Eco friendly mobility was the basic idea“, says CEO Egbert Miebach.



Stakeholders Seafood: University Kiel and GMA

Example: GMA is running trials in „Life Cycle Assessment“ for Seafood

Vorstellung: Gesellschaft für Marine Aquakultur (GMA) - mbH

Meilensteine:

- 2004 auf Initiative des MWWV gegründet
- 2007 wissenschaftl. Leitung über CAU Professur berufen
- 2010 Fertigstellung der Forschungsinfrastruktur



... Die Aufgabenbereiche der GMA umspannen die gesamten Themenfelder der marinen Aquakulturforschung, als auch die Vermittlung des spezifischen Wissens. Weiterhin soll ein landesweites Netzwerks unter Einbeziehung aller Partner aus Wirtschaft, Wissenschaft, Wirtschafts- und Technologieförderung sowie Politik und Verwaltung aufgebaut werden. ...

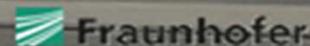
Gesellschafter:

egeb: Wirtschaftsförderung.

Entwicklungsgesellschaft
Brunsbüttel mbH



Helmholtzzentrum f.
Ozeanforschung

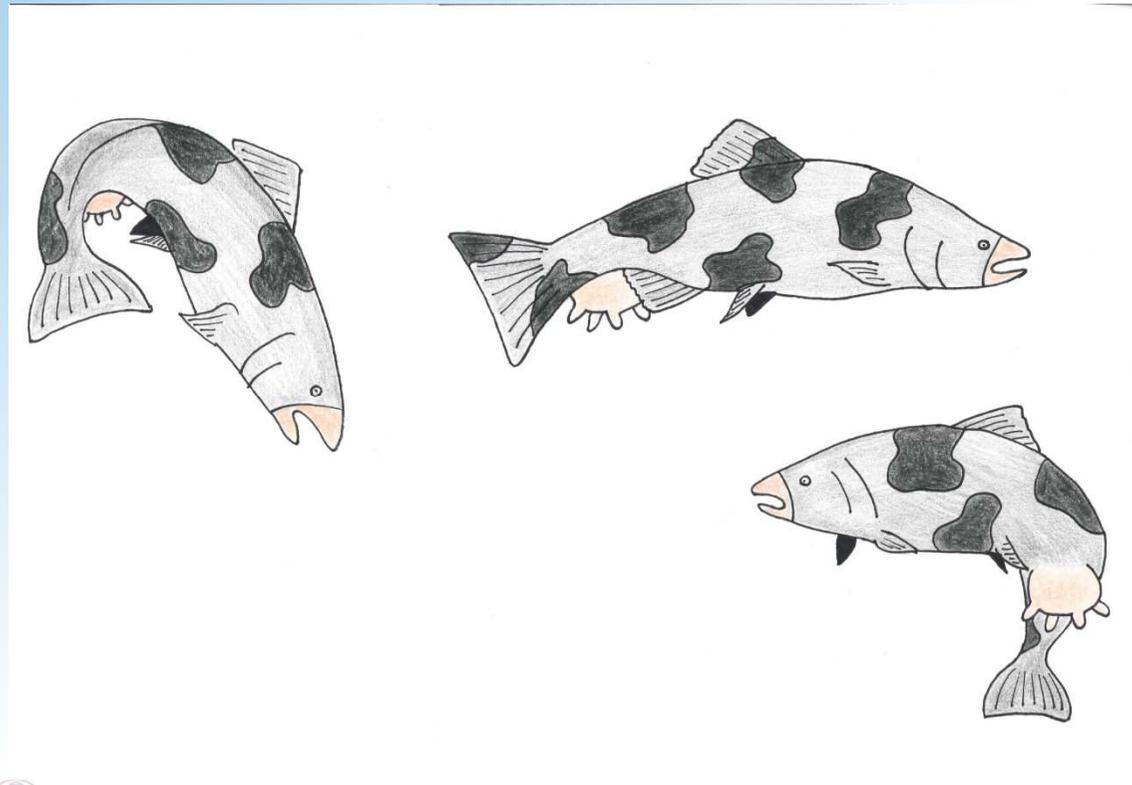


Fraunhofer Gesellschaft



Christian Albrechts
Universität zu Kiel

Aquaculture feed



Drawing by Aileen Winkelmann,
Euroduna Rohstoffe GmbH



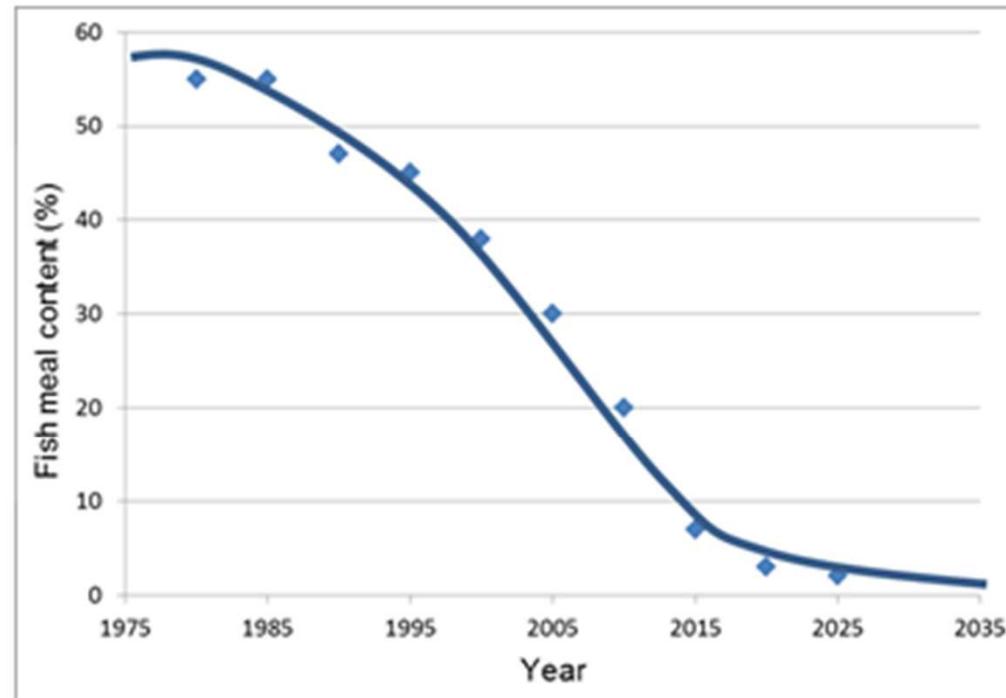
Is salmon becoming vegetarian?



Cowsalmon? Or maybe Cowmon or Calmon?
Or even FRANKENFISH?



Fishes of Aquaculture/SALMON = Vegetarians?



Development of fish meal utilization in Salmonids diets for aquaculture (Schulz, 2014)



Only vegetarian raw materials?

EWOS RAW MATERIAL USE 2015

Raw materials used for salmonid feeds and feeds for other species like pangasius and tilapia

	Inclusion (as % of raw materials)	Origin
Carbohydrates & binders incl beans & peas	19.0%	Australia, Canada, Chile, Germany, UK, USA, Vietnam.
Fishmeal	16.6%	Chile, China, Denmark, Iceland, Ireland, Norway, Panama, Peru, UK, USA.
Soy protein concentrate	15.3%	Brazil
Vegetable oil	14.5%	Argentina, Baltics, Canada, Chile, Germany, Netherlands, Russia, UK
Fish oil	9.8%	Chile, China, Denmark, Iceland, Ireland, Norway, Panama, Peru, UK, USA.
Animal by-products	6.7%	Argentina, Belgium, Brazil, Canada, France, Germany, Italy, Spain, USA.
Wheat gluten	5.5%	Argentina, Belgium, Canada, China, France, Germany, Lithuania, Russia, UK, USA
Other vegetable proteins	3.5%	Argentina, Dubai, Philippines, Vietnam, USA
Sunflower meal	3.1%	Argentina, Lithuania, Russia, Ukraine
Maize gluten	2.6%	Belgium, France, USA
Soy HiPro & soy extracted	1.9%	Argentina, China
Pea protein concentrates	0.7%	Canada, China, Germany
Oil seeds	0.7%	Canada, UK
SUM	100%	= around 33%

Microingredients such as vitamins, minerals and pigments are not included in this summary.

source: Ewos



Forecast Development Feed

- “Fishmeal replacer “ made from methane gas from segmentation by Cargill
- “Fish oil replacer“ made from algae oil from sugar cane by Bunge
- Insects: as a valuable source of protein and oil
- Protein carrier: SPC, SPI, corn- and wheat gluten
- Protein from “Duckweed“
- “Supplementary fishmeal fractions”, like cholesterol, amino acids or fatty acids



Forecast Development Sustainability

- Breeding
- Netfishing development
- New feeding concepts, new raw materials, new feed additives
- New pondsystems
- Universities bring new results
- and others..... !!!!!!!!!!!



Conclusion

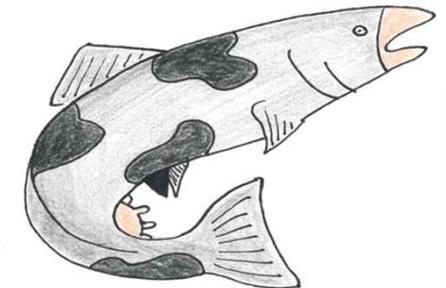
Sustainability will be dynamically improved!

Development will come and will bring progress!!!



Acknowledgement for support

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Mr. Marcio Castro des Souza, FAO, Senior Fishery Industry Officer



...as well as a big “Thank You”
to all the fish to feed us!!!





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THANK YOU
FOR YOUR
TIME!