

Future predictions for availability of raw material from by- products

10th April 2019

Dr Neil Auchterlonie

Future Predictions for availability of raw material from byproducts

1 Funder & Data

IFFO, The Marine Ingredients Organisation

2 Research Delivery



UNIVERSITY OF
STIRLING

Institute of Aquaculture, University of Stirling,

Project Lead: Dr Richard Newton

Alban Caratis

Jean Peignon

Julien Stevens

IFFO, The Marine Ingredients Organisation

Founded in **1959**

International trade organisation which represents and promotes member companies in the **fishmeal and fish oil** industry worldwide

50 Countries are represented within IFFO

60% of world production

80% of the fishmeal and fish oil traded worldwide

The value and sustainability of marine ingredients

- 1. Our industry is committed to transparent supply chains**
- 2. Marine ingredients mean quality feed**
- 3. Marine ingredients help feed a growing population**

Raw material from (fisheries & aquaculture) byproducts

Aquaculture – feeding the world



>50%

Marine Ingredients

Why are they so important?

Raw material estimates - Approach

A model was constructed of fisheries and aquaculture production estimated from FAO databases

Top twenty species by production volume
across nine regions

Amount of processed product
Quantity of by-product available

Quantity of whole species directed to fish
meal and oil

Quantity of by-product directed to
fishmeal and oil

Amount of by-product raw material that is
currently not utilised and potential fishmeal
and oil that could be obtained from it

Potential extra EPA and DHA that could be
obtained

Raw material supply



IFFO

THE MARINE INGREDIENTS ORGANISATION

Results

An increasing trend for the use of byproducts

33%

Results

Regional differences in byproduct utilisation

Europe:

54%

Mostly from wild capture

Results

Regional differences in byproduct utilisation

Asia and China showed most potential for gains in fishmeal and fish oil from underutilised resources from both aquaculture and capture

Results

**Fishmeal production will grow
as more by-product is available**

**....and growth in
aquaculture**

Results

RAW MATERIAL (TONNES ,000)

Region	Whole fish	By-product from wild capture	By-product from aquaculture	Total Raw Material Used
Europe	1,502	1,165	331	2,998
Asia (exc China)	2,577	827	851	4,255
China	1,251	168	367	1,787
M East	188	32	19	240
CIS	260	103	-	364
Africa	650	222	6	877
S. America	6,810	768	331	7,909
N. America	730	427	31	1,188
Oceania	11	42	13	66
Totals	13,980	3,754	1,949	19,683

Results

FISHMEAL PRODUCTION (TONNES ,000)

Region	From Whole fish	From By-product	Total	% from By Product
Europe	320	381	701	54
Asia (exc China)	580	454	1,034	44
China	281	152	433	35
M East	42	13	55	23
CIS	57	27	84	32
Africa	146	60	206	29
S. America	1,532	289	1,821	16
N. America	170	118	288	41
Oceania	2	14	16	85
Totals	3,131	1,508	4,639	33

Results

POTENTIAL SOURCES OF ADDITIONAL RAW MATERIAL AND PRODUCTION (TONNES ,000)

Region	Unused By-Product potential	Unused By-Product fishmeal potential	Unused By-Product fish oil potential	Full processing by-product potential	Full processing by-product fishmeal potential	Full processing by-product fish oil potential
Europe	585	139	21	667	176	29
Asia (exc China)	4,628	827	110	12,413	3,293	481
China	1,011	221	25	15,231	4,073	653
M East	479	87	16	476	123	21
CIS	1,132	265	44	1,413	365	62
Africa	1,053	233	37	2,758	730	106
S. America	1,330	264	38	1,310	359	54
N. America	1,380	302	57	1,387	363	67
Oceania	109	26	4	181	48	8
Totals	11,707	2,365	352	35,837	9,530	1,481

Key Messages

- **More material is available**
- **Aquaculture will continue to drive an increase**
- **Constraints are practical/logistical (mostly)**

Fisheries raw material flat supply, but....

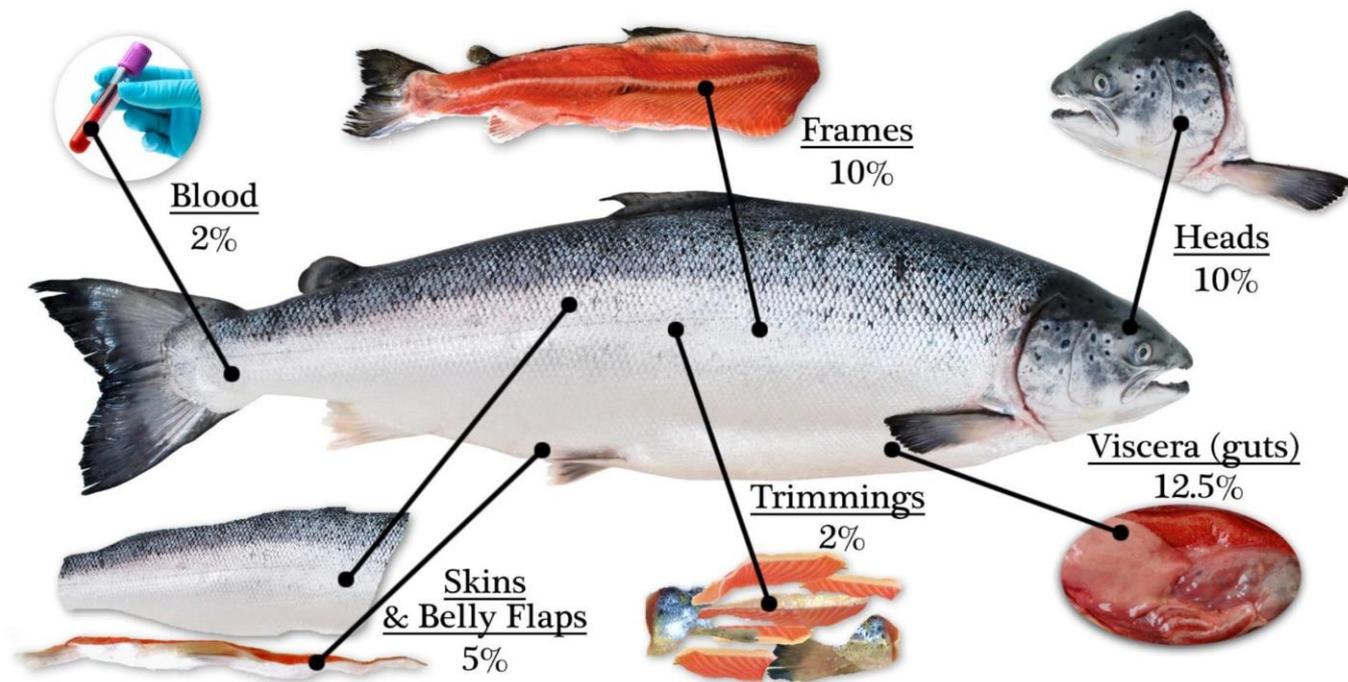
- **Krill**
- **Other invertebrates (e.g. starfish)**
- **Mesopelagic species**

Aquafeed

Supporting aquaculture growth

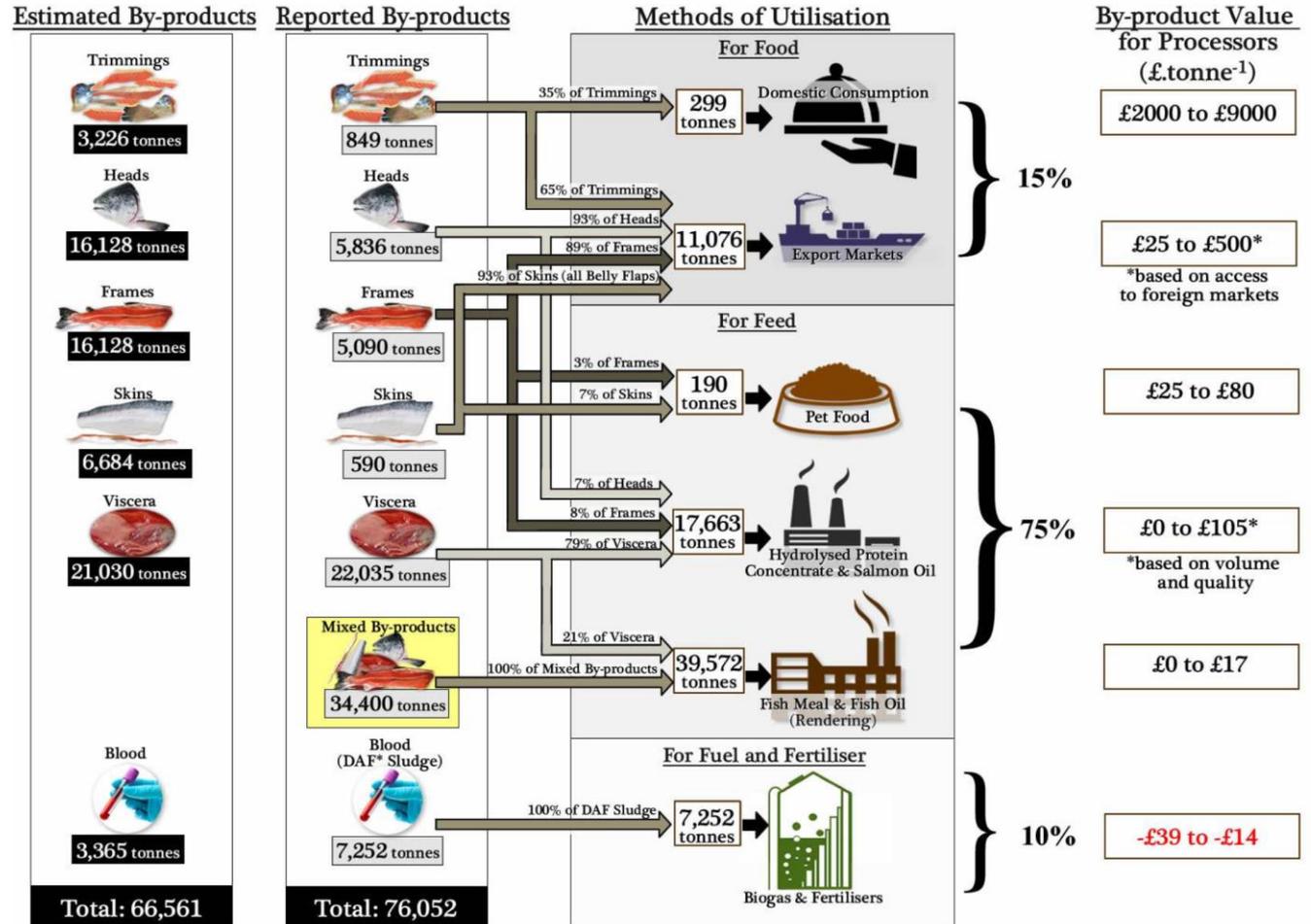


Aquaculture byproduct



Atlantic Salmon By-product Fractions as a Percentage of the Total Wet Weight. Compiled from: FAO 2014; Rustad 2007; Liaset *et al.* 2003; Sandnes *et al.* 2003

Results



Stevens, 2017



Byproduct Other



- Special compounds: Peptides, Chitin, Chondroitin
- Skin products
- Mineral premixes

**Thank you
for your attention**