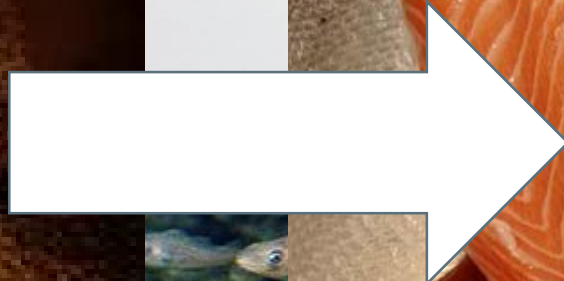
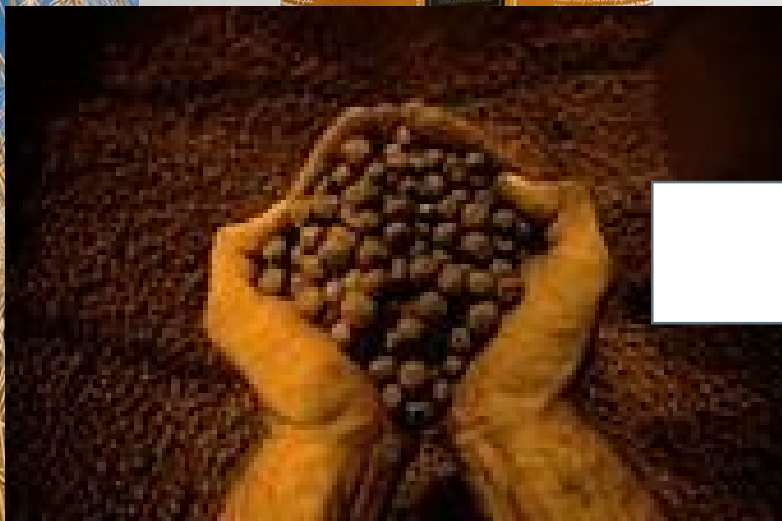
A photograph of a salmon farm in Norway. In the foreground, a salmon is splashing in the water. In the background, there are several large circular cages floating in the sea, with snow-capped mountains in the distance under a clear sky.

Feed resources in Norwegian salmon farming in 2016

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ISFNF 2018, Las Palmas

 **Nofima**



Feed resources:

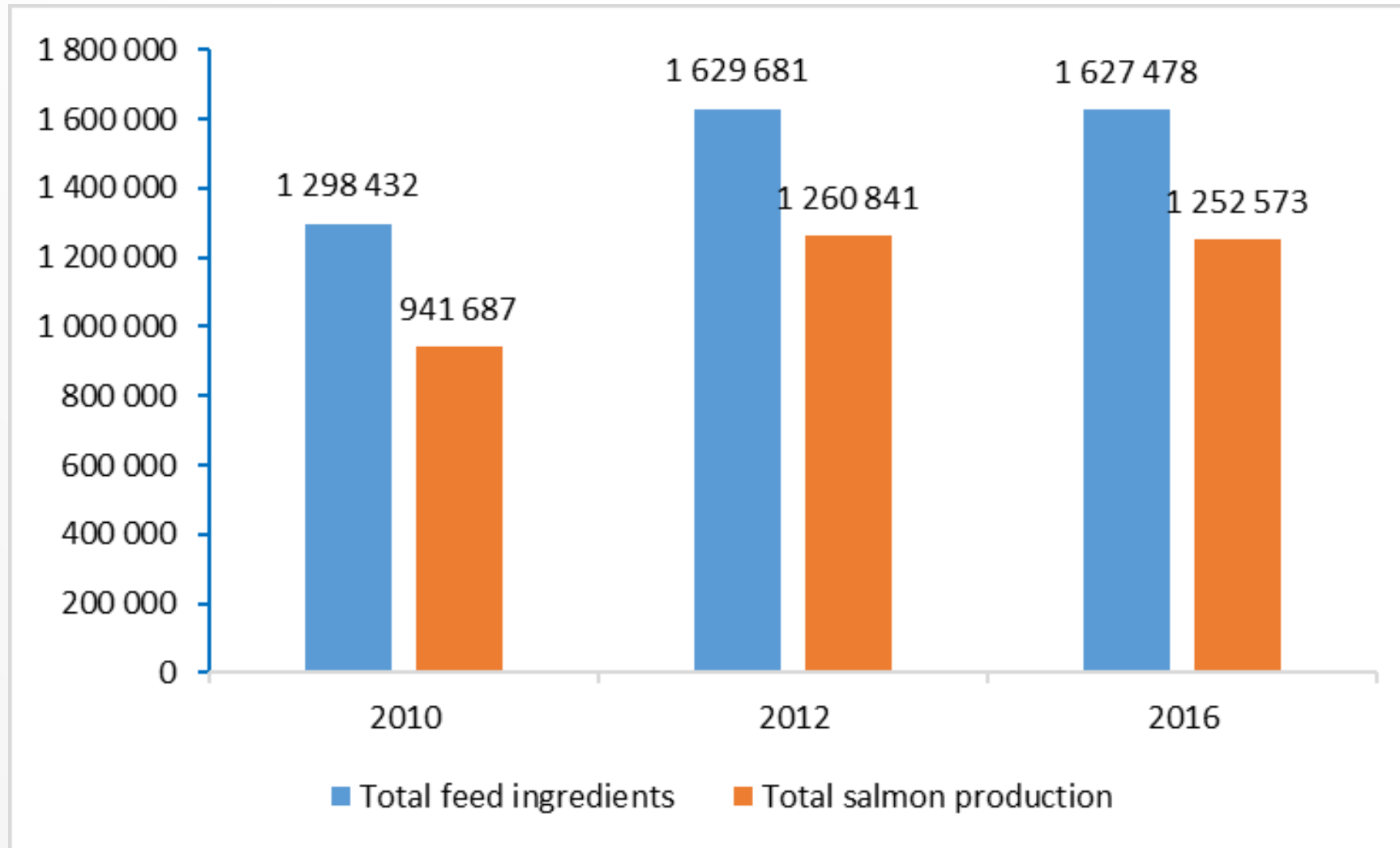
**Total use of feed ingredients for salmon feed in Norway
in 2016 from**

- BioMar**
- Ewos (Cargill)**
- Marine Harvest**
- Skretting**

Total production of salmon in 2016

**Whole body analysis of salmon, see poster P.1.06 by
Torbjørn Åsgård**

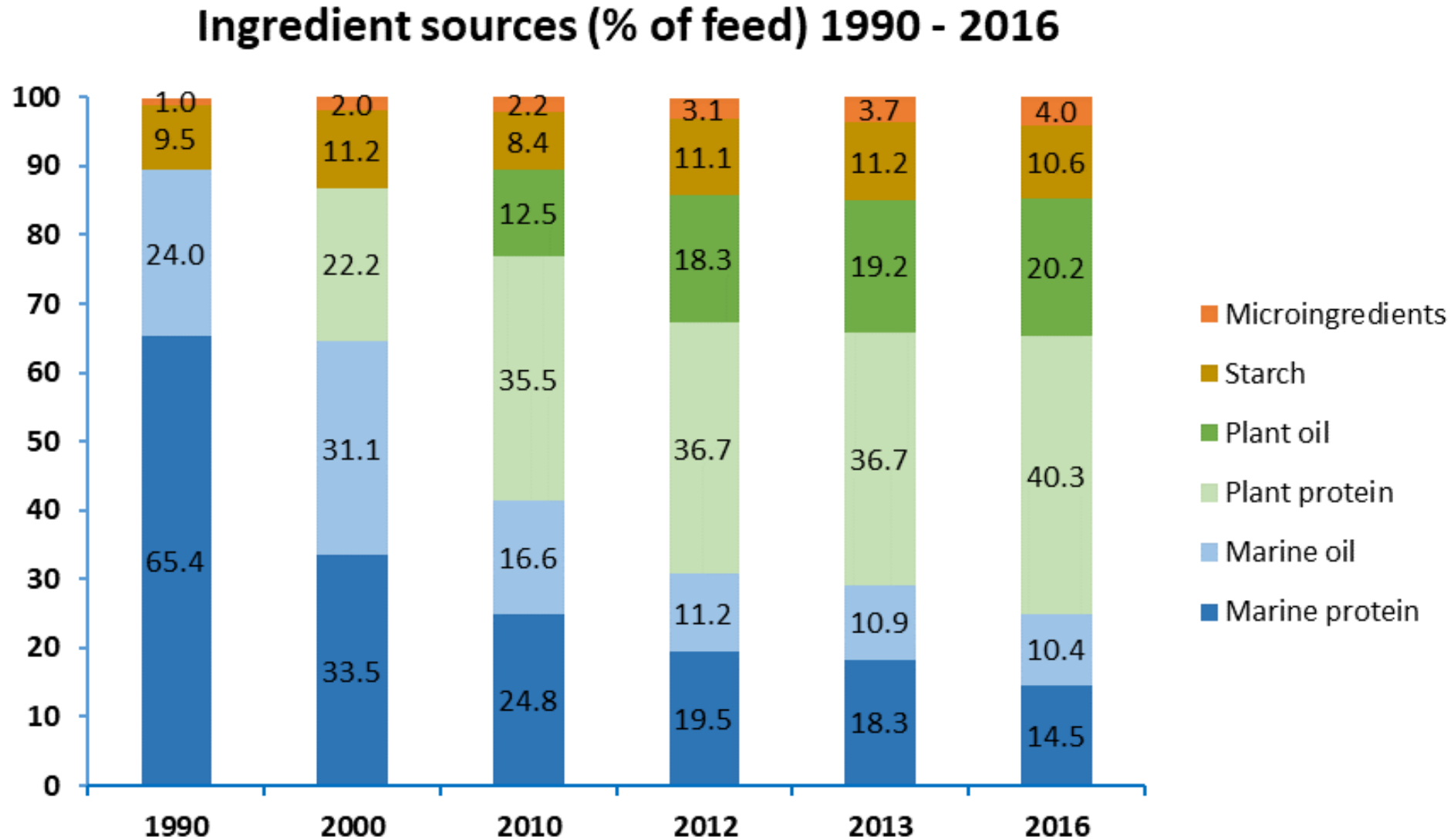
Total feed ingredients used and salmon produced (ton) in 2010, 2012 and 2016



Feed conversion ratio, FCR

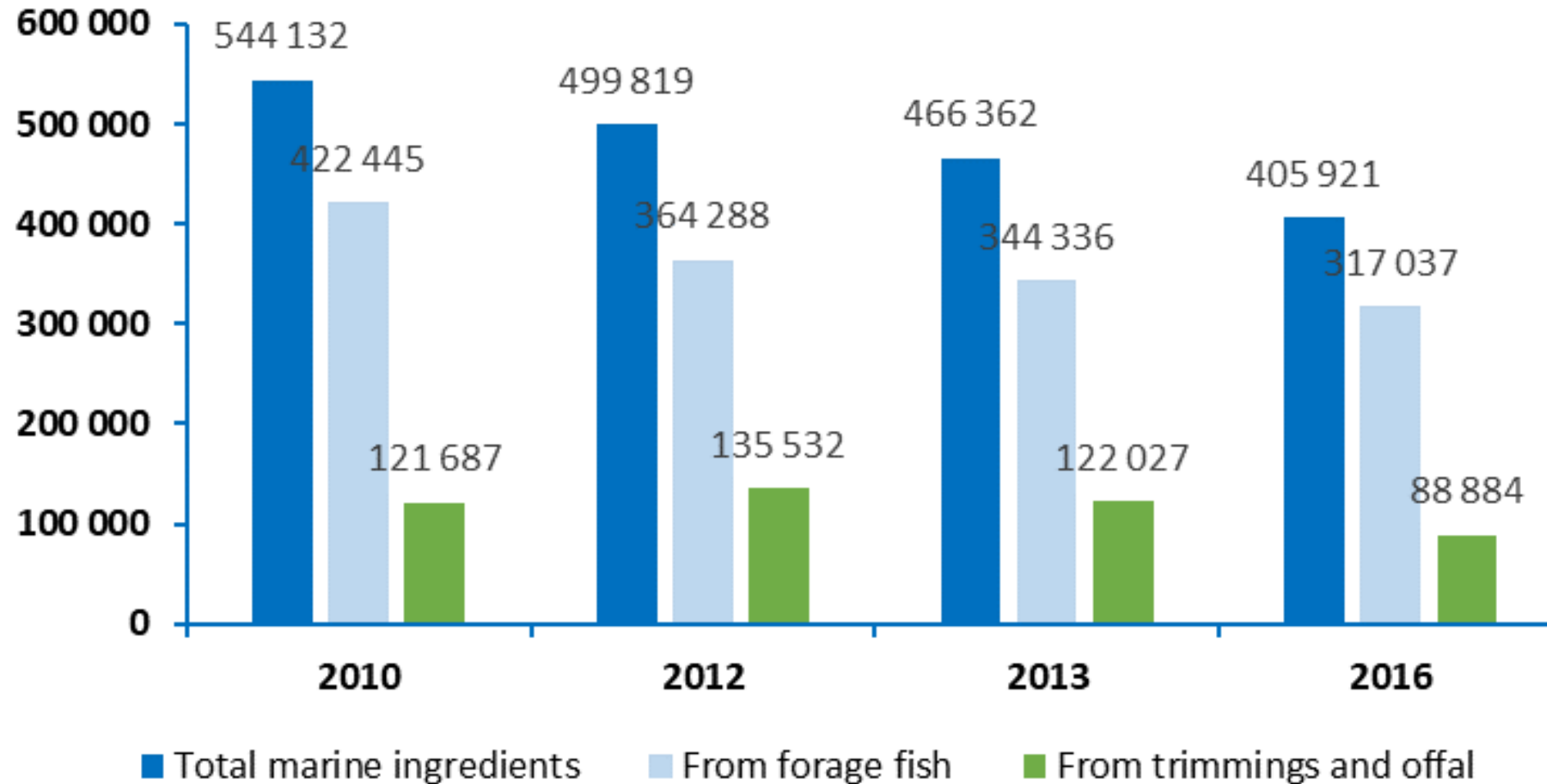
2016	Ton	FCR
Total salmon production:	1,252,573	
Ingredients used, 'as is'	1,627,478	1.30
Ingredients used, dry matter	1,520,358	1.21
Traded feed	1,543,000	1.23

Ingredient sources (% of feed) 1990 - 2016

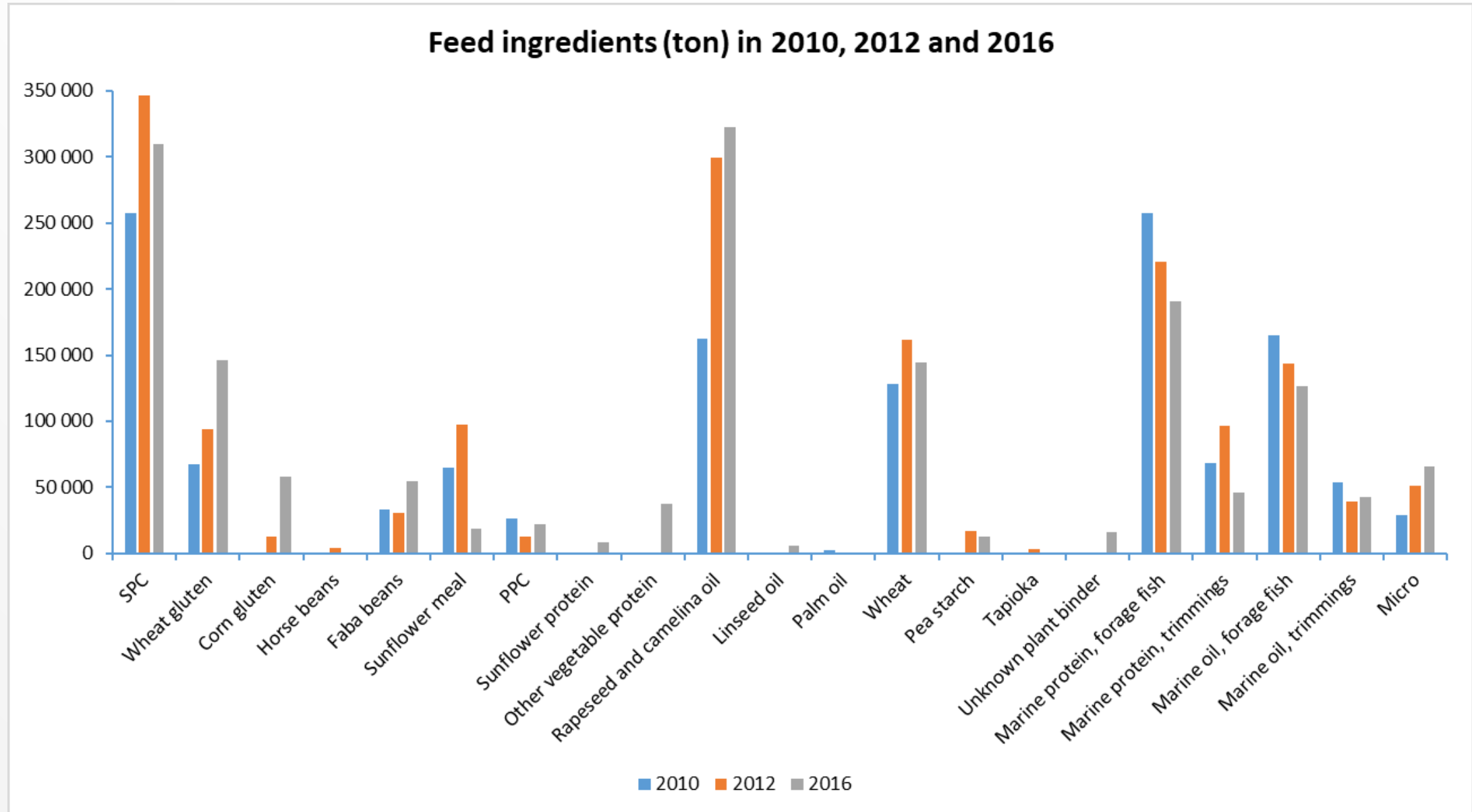


Use of marine ingredients (ton) 2010 - 2016

Use of marine ingredients (ton) 2010 - 2016



Feed ingredients (ton) in 2010, 2012 and 2016



Average composition of Norwegian salmon feed in 2016

	Ingredient	%
Plant protein sources	SPC	19.0
	Wheat gluten	9.0
	Corn gluten	3.6
	Horse beans	0.0
	Faba beans	3.4
	Sunflower meal	1.1
	PPC	1.3
	Sunflower protein	0.5
	Other vegetable protein	2.3
Plant oils	Rapeseed and camelina oil	19.8
	Linseed oil	0.3
Starch sources	Wheat	8.9
	Pea starch	0.8
	Unknown plant binder	1.0
Marine protein sources	Marine protein, forage fish	11.7
	Marine protein, trimmings	2.8
Marine oils	Marine oil, forage fish	7.8
	Marine oil, trimmings	2.6
Micro ingredients	Micro	4.0

Retention of nutrients and energy

	In feed, ton or GJ	Retention in whole body, %	Retention in fillet, %
Dry matter	1,520,358	34	18
Energy	38,566	41	16
Crude protein	579,936	37	28
Crude lipid	545,813	49	17
EPA+DHA	38,822	37	29
Phosphorus	21,007	18	10

Assumed fillet yield: 65%

Fillet composition from www.matvaretabellen.no

Aknowledgement

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Data on feed ingredients were provided by BioMar, Ewos, Marine Harvest and Skretting

Fish for whole body analysis was provided from Lerøy and Grieg Seafood