



Resource budget for raw materials in Norwegian salmon feeds 2010 and 2012

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Nutrition and Feed Technology

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Salmon produced in Norway

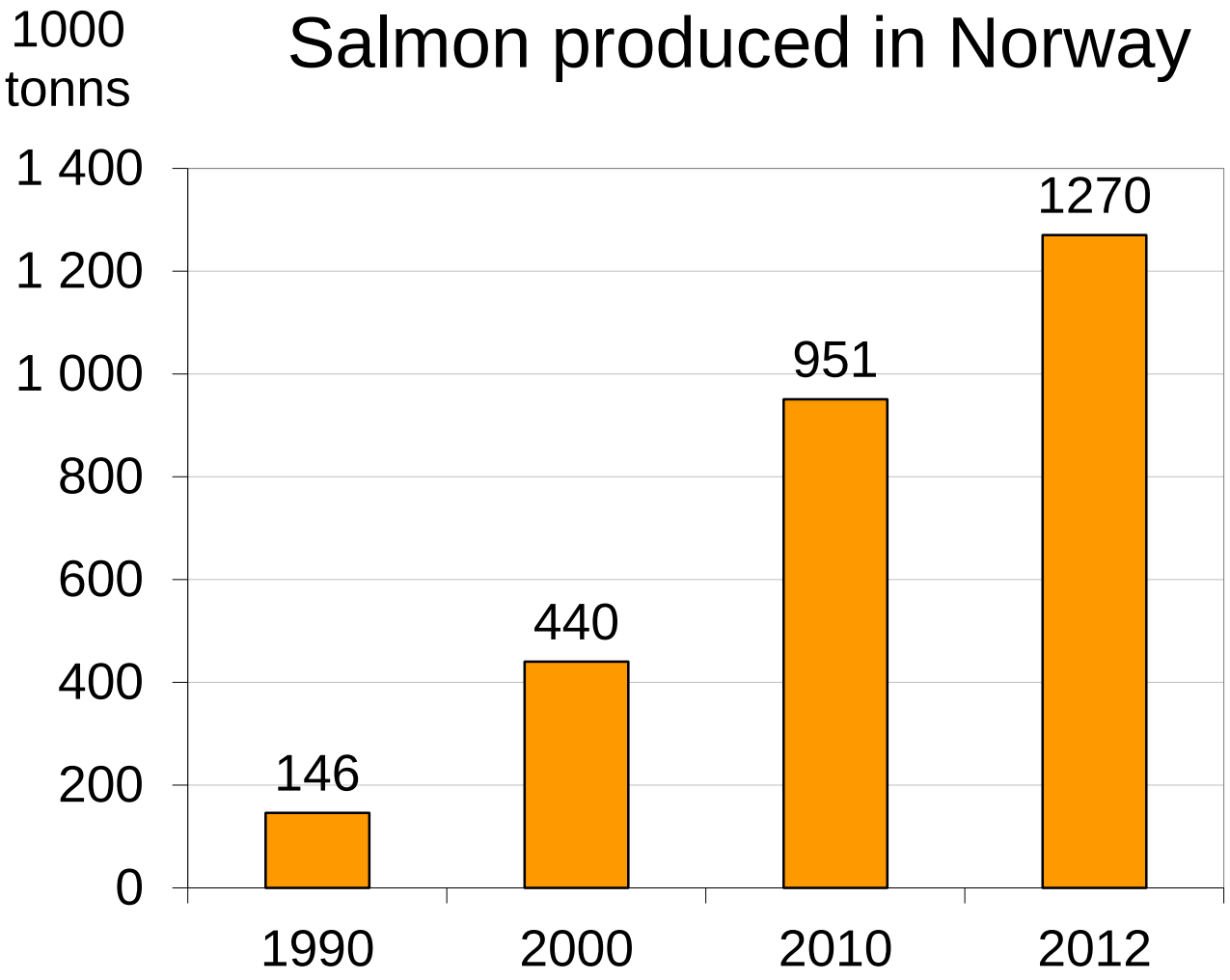
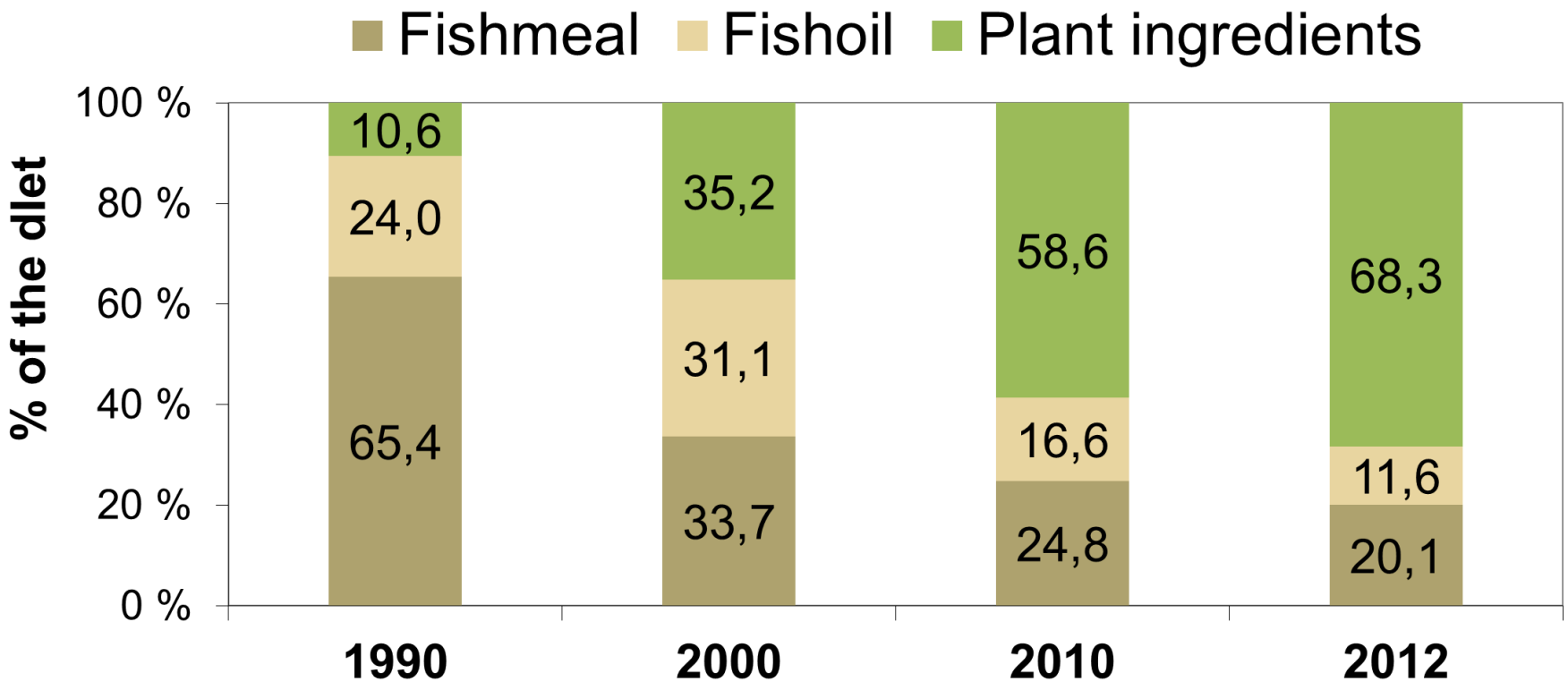
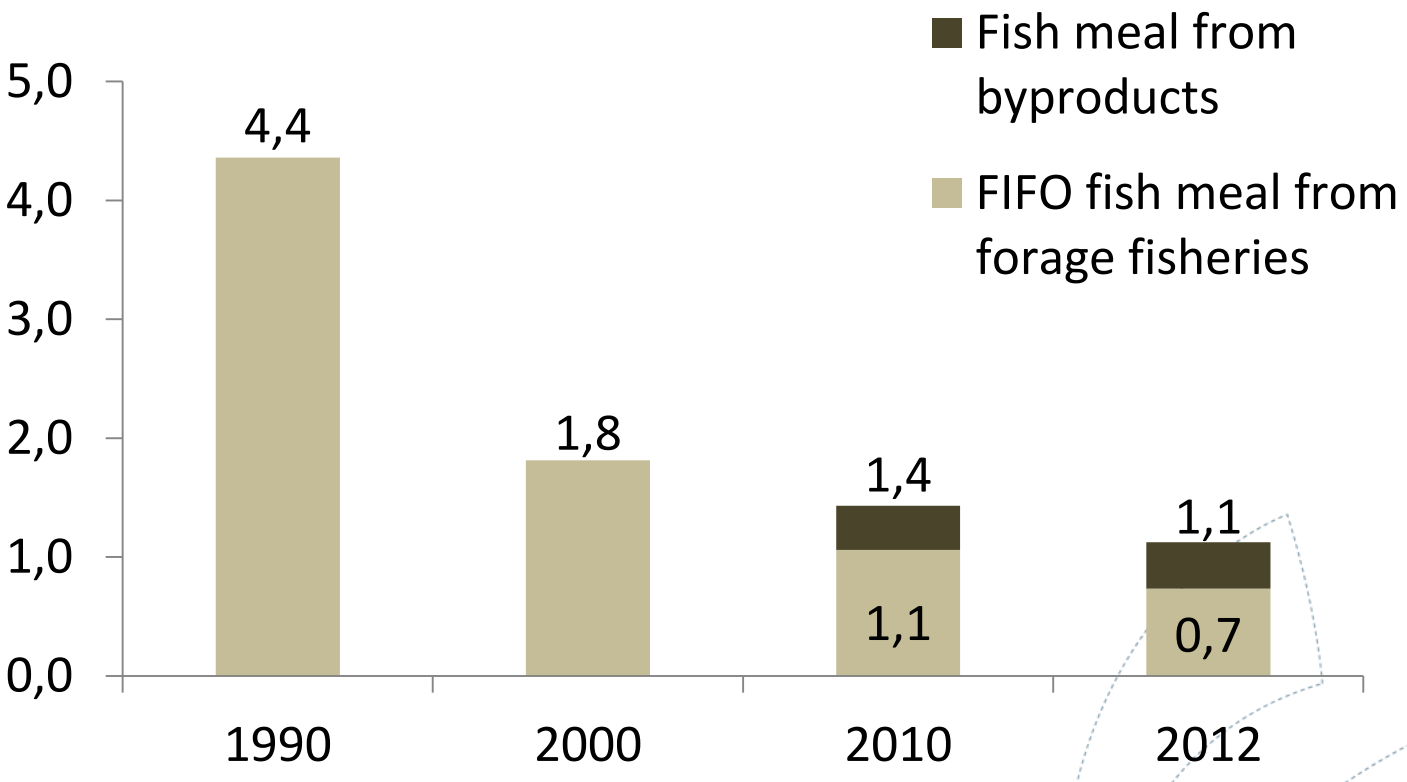


Figure 1: Norwegian salmon feed 1990-2012



FIFO for fish meal 1990-2012



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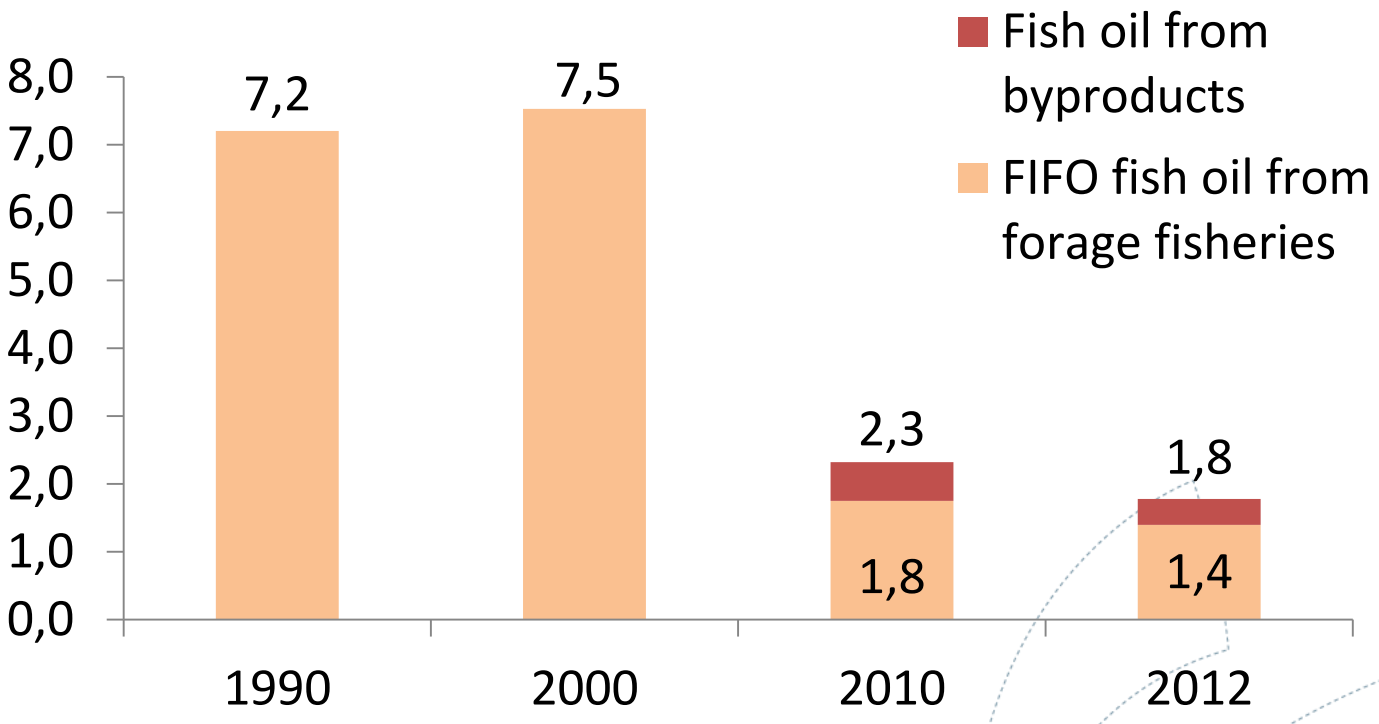
FIFO for Fish oil 1990-2012



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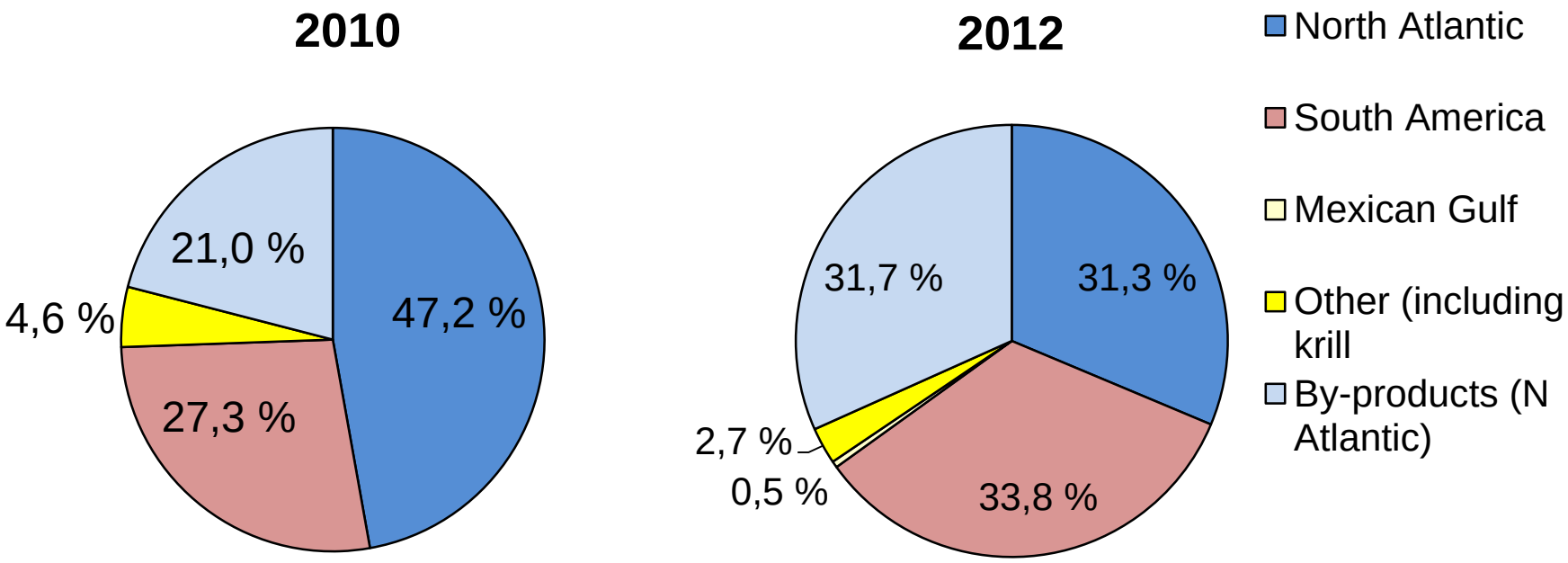
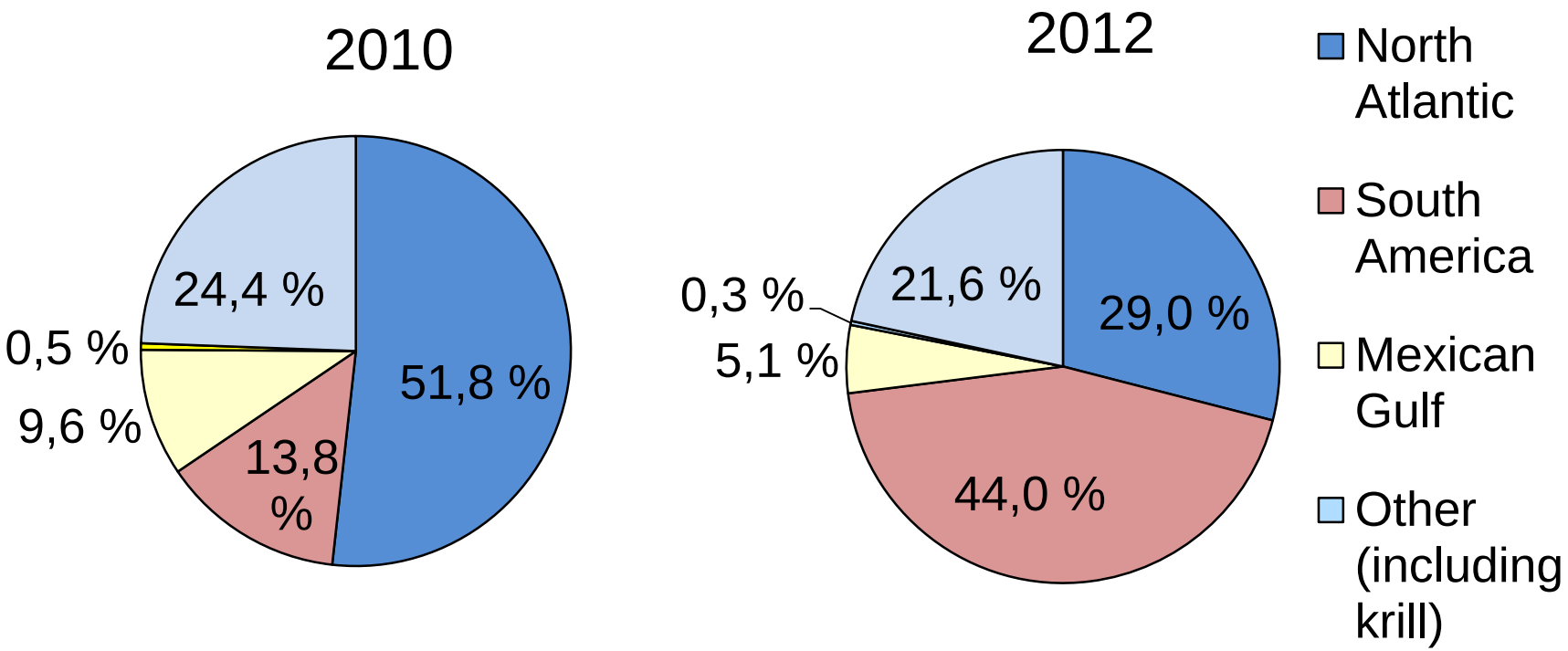
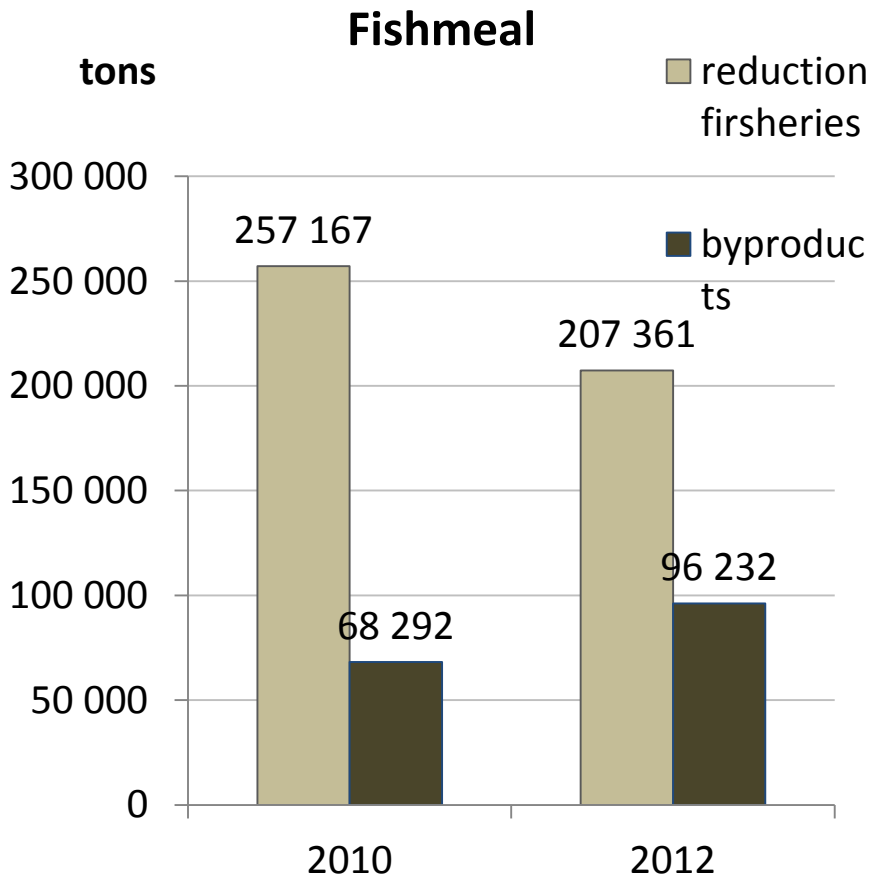
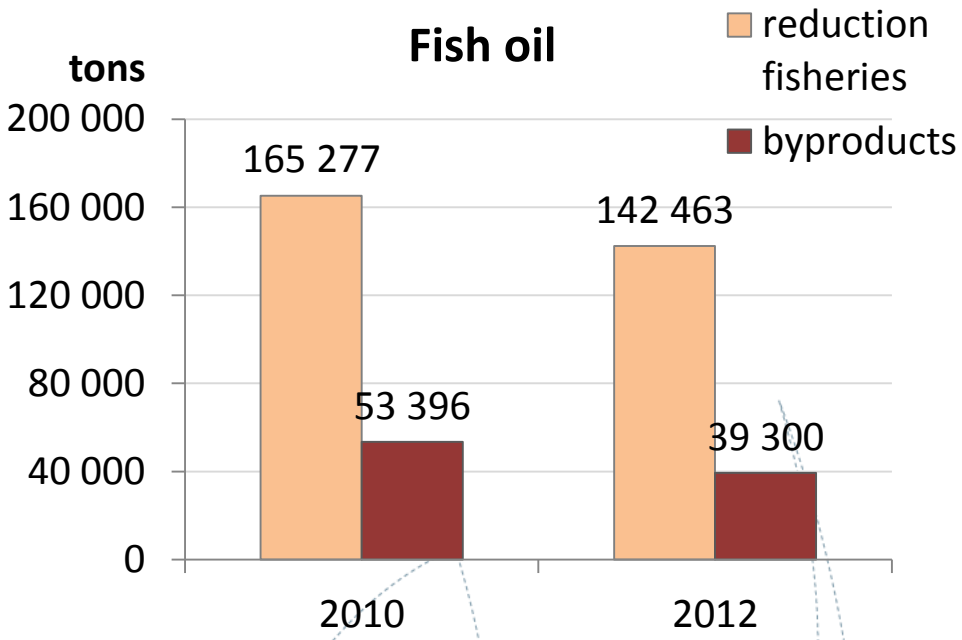
Origin of fish meal



Origin of fish oil




Fishmeal
tons
reduction firsheries
byproducts
300 000
250 000
200 000
150 000
100 000
50 000
0
257 167
68 292
207 361
96 232
2010
2012


Fish oil
tons
reduction fisheries
byproducts
200 000
160 000
120 000
80 000
40 000
0
165 277
53 396
142 463
39 300
2010
2012

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Nutrient or energy content and utilization in salmon

2012	Nutrient content (% or MJ/kg)		Retention (% of eaten)	
	Whole body	Fillet	Whole body	Fillet
Energy	12.6	11.5	45	27
Protein	17.5	19.1	33	24
Fat	21.3	18.4	51	29
EPA+DHA	1.58	1.36	41	23

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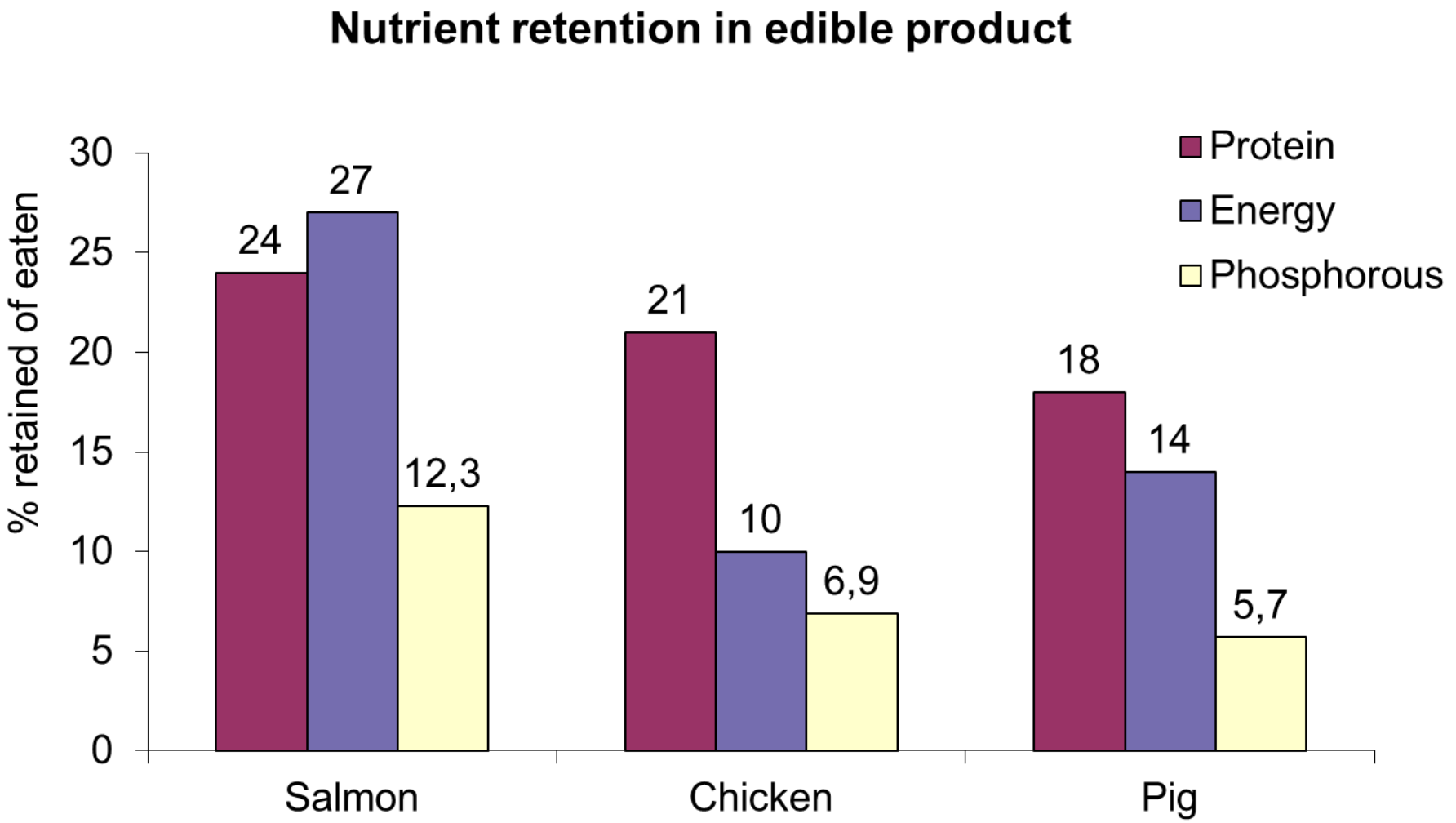
Nutrient retention in edible product
% retained of eaten
30
25
20
15
10
5
0
24
27
12,3
21
10
6,9
18
14
5,7
Salmon
Chicken
Pig
Protein
Energy
Phosphorous

Conclusions

- We have a detailed overview of the feed resources used in Norwegian salmon farming
- The use of feed recourses is very dynamic
- The salmon production increased more than 30 % from 2010 til 2012 but the use of fish meal and oil from reduction fisheries (i.e. fish caught for this purpose) decreased
- Salmon is very efficient in converting feed resources to meat compared to terrestrial domestic animals and thereby an important innovation in meat production
- We get more for less and the industry becomes less dependent on specific recourses

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Thank you for your attention!
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