



Hvis fisken fikk velge

Thomas Vian Pettersen - Polarfeed

Lofotseminaret – 15. Juni 2022

*Fôr fra Polarfeed har 37% lavere
fotavtrykk enn det gjennomsnittlige
fiskefôret i Norge*

Tallgrunnlag

Rapport 2/2022 • Utgitt April 2022



Utnyttelse av fôrressurser i norsk oppdrett av laks og regnbueørret i 2020

Faglig sluttrapport

Tallgrunnlag

	Ingrediens	Tonn	%
Vegetabiliske	Soyaproteinkonsentrat	413 611	20,9
Proteinkilder	Hvetegluten	193 904	9,8
	Guarprotein	84 677	4,3
	Solsikke	67 798	3,4
	Erteprotein	27 306	1,4
	Maisgluten	12 971	0,7
Vegetabiliske	Rapsolje	356 499	18,0
Oljer	Linolje	25 874	1,3
	Soyaolje	7 392	0,4
	Kamelinaolje	7 022	0,4
	Kokosolje	1 006	0,1
Karbohydratkilder	Hvete	127 878	6,5
	Fababønner	70 568	3,6
	Ertemel	48 592	2,5
Marine proteinkilder	Fiskemel fra reduksjonsfiske*	174 172	8,8
	Fiskemel fra avskjær	65 539	3,3
Marine oljer	Fiskeolje fra reduksjonsfiske*	164 611	8,3
	Fiskeolje fra avskjær	38 986	2,0
Annet	Insektmel, encelleprotein, fermenterte produkt, mikroalger	8 126	0,4
Mikroingredienser	Vitamin, mineral, aminosyrer, astaxantin m.m.	80 177	4,1
Sum		1 976 709	100

* Inkluderer alt marint råstoff, også en liten mengde krill, selv om dette ikke er fisk

Beregning



Transport og fotavtrykk?

Table 3-13 Transport of feed raw materials from production to feed mill in Norway.

Transport	Composition	GHGs (kg CO ₂ /ton ingredient at feed mill entry)
Vegetable ingredients from Europe	1440 km road and 135 km sea (ferry)	145
Marine ingredients from Europe	500 km road and 1 617 km by sea	59
Marine ingredients from South America	500 km by road and 13 425 km by sea	197
Marine ingredients from North America	500 km road and 8 906 km sea	146
Marine ingredients within Norway	500 km road	45

Transport og
fotavtrykk?

kg CO2 eq / tonn Inkl. LUC

SPC, Brasil, eks. transport: 6 719

SPC, Brasil, inkl. transport: 6 916

Grunnlag for videre beregning

	Inklusjon	Datakilde	Opprinnelse	kg CO2 eq / tonn Inkl. LUC
SPC	20,9 %	GFLI	BR	6 719,00
Hvetegluten	9,8 %	GFLI	EU (RER)	3 556,61
Guarmel	4,3 %	GFLI	EU (RER)	1 146,19
Solsikke	3,4 %	GFLI	EU (RER)	932,62
Erteprotein	1,4 %	GFLI	EU (RER)	1 353,48
Maisgluten	0,7 %	GFLI	GLO	1 412,04
Rapsolje	20,2 %	GFLI	EU (RER)	2 769,02
Hvete	6,4 %	GFLI	EU (RER)	448,33
Fababønner	3,6 %	GFLI	EU (RER)	1 146,19
Ertemel	2,5 %	GFLI	EU (RER)	803,01
Fiskemel (inkl. krillmel)	12,1 %	GFLI	EU (RER)	1 275,67
Fiskeolje	10,3 %	GFLI	EU (RER)	821,09
Novel	0,4 %	GFLI		
Mikro	4,0 %	GFLI	EU (RER)	1 176,30

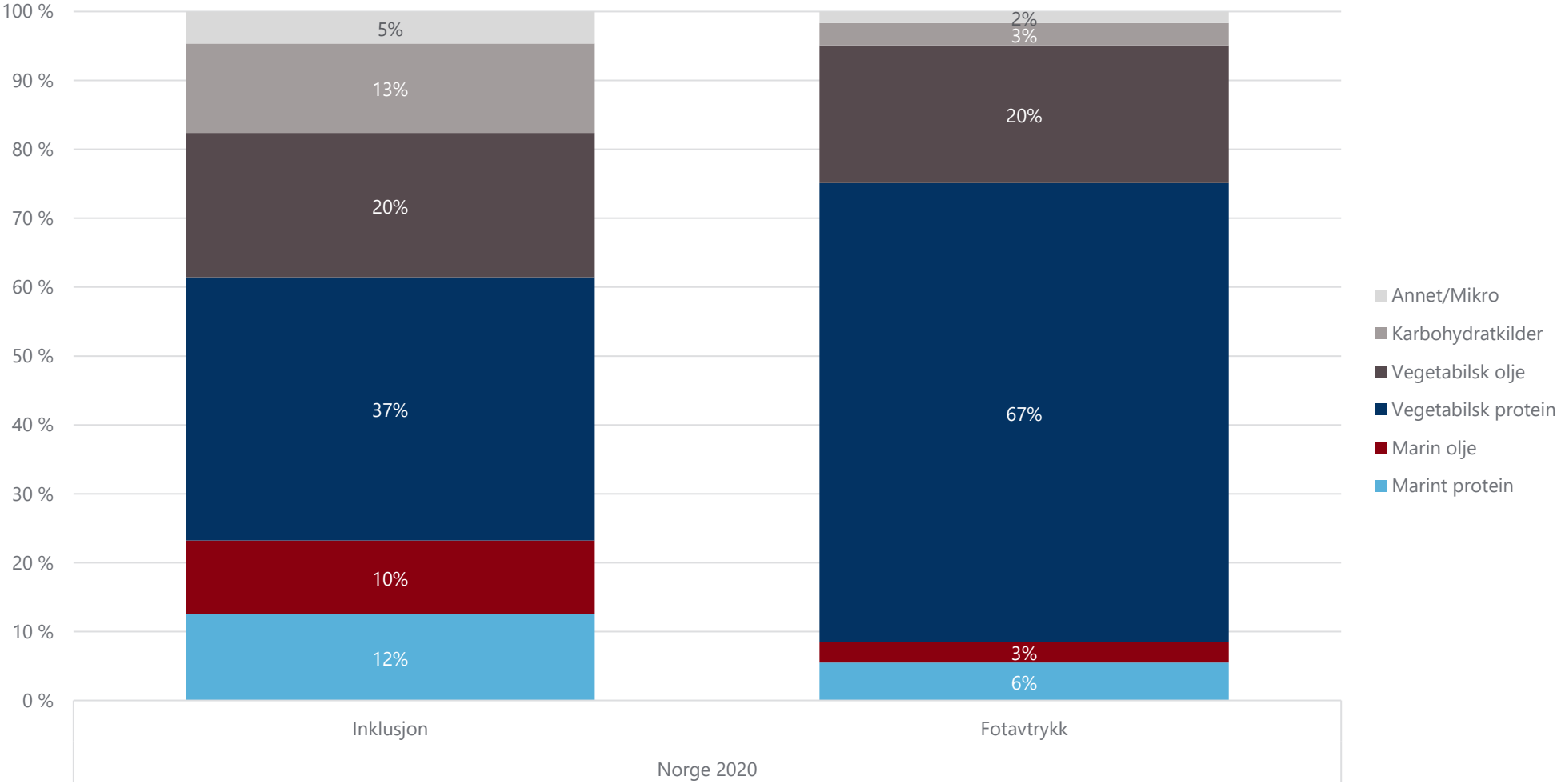
Grunnlag for videre beregning

Norge 2020		
	Inklusjon	CO ₂ e/kg
SPC	20,9 %	1,40
Hvetegluten	9,8 %	0,35
Guarmel	4,3 %	0,05
Solsikke	3,4 %	0,03
Erteprotein	1,4 %	0,02
Maisgluten	0,7 %	0,01
Rapsolje	20,2 %	0,56
Hvete	6,4 %	0,03
Fababønner	3,6 %	0,04
Ertemel	2,5 %	0,02
Fiskemel (inkl. krillmel)	12,1 %	0,15
Fiskeolje	10,3 %	0,08
Novel	0,4 %	-
Mikro	4,0 %	0,05
SUM	100,0 %	2,80

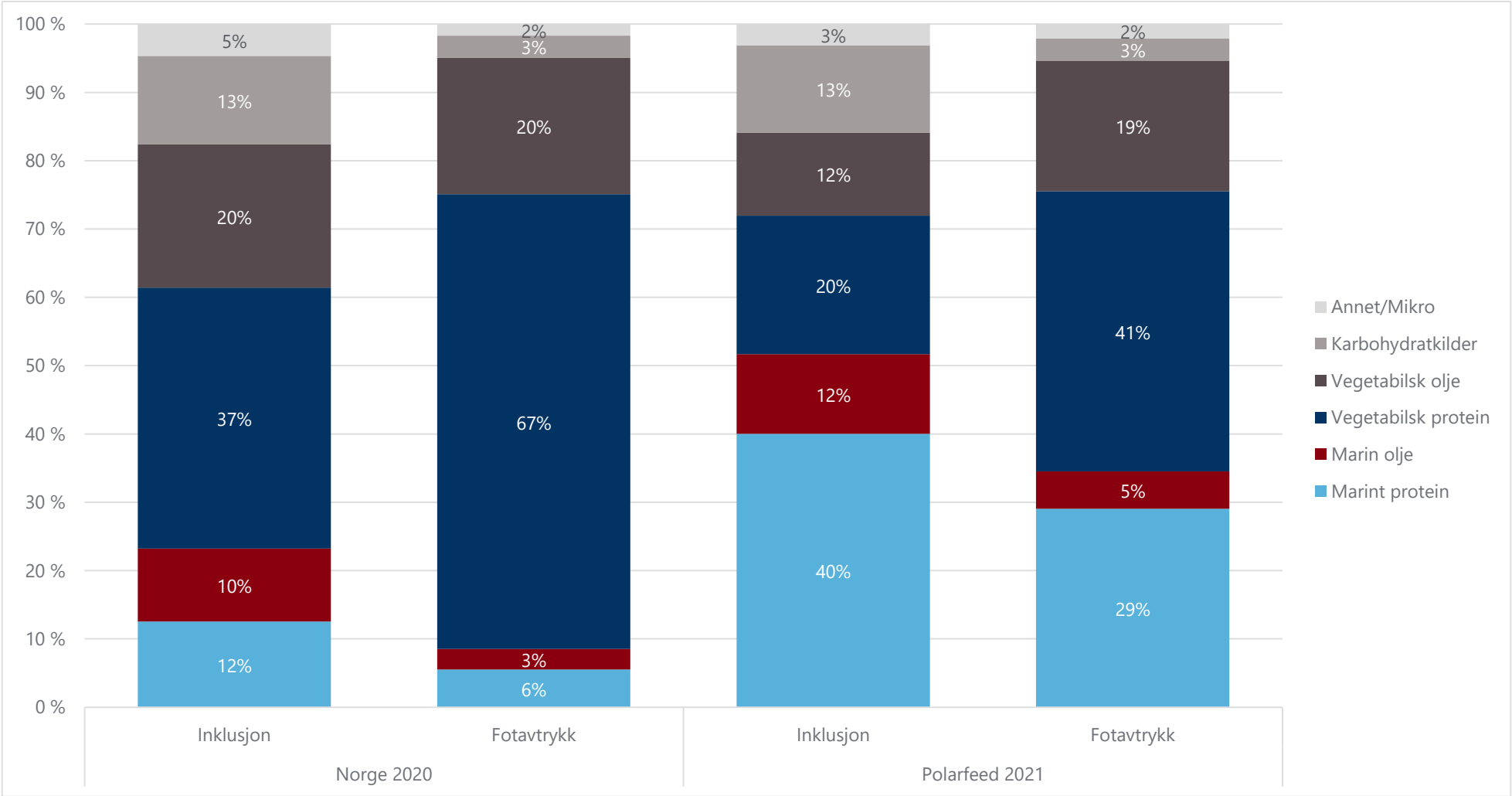
Grunnlag for videre beregning

	Inklusjon	CO ₂ e/kg	Andel av CO ₂ e/kg
SPC	20,9 %	1,40	50 %
Hvetegluten	9,8 %	0,35	12 %
Guarmel	4,3 %	0,05	2 %
Solsikke	3,4 %	0,03	1 %
Erteprotein	1,4 %	0,02	1 %
Maisgluten	0,7 %	0,01	0 %
Rapsolje	20,2 %	0,56	20 %
Hvete	6,4 %	0,03	1 %
Fababønner	3,6 %	0,04	1 %
Ertemel	2,5 %	0,02	1 %
Fiskemel (inkl. krillmel)	12,1 %	0,15	6 %
Fiskeolje	10,3 %	0,08	3 %
Novel	0,4 %	-	0 %
Mikro	4,0 %	0,05	2 %
	100,0 %	2,80	100,0 %

Norge 2020



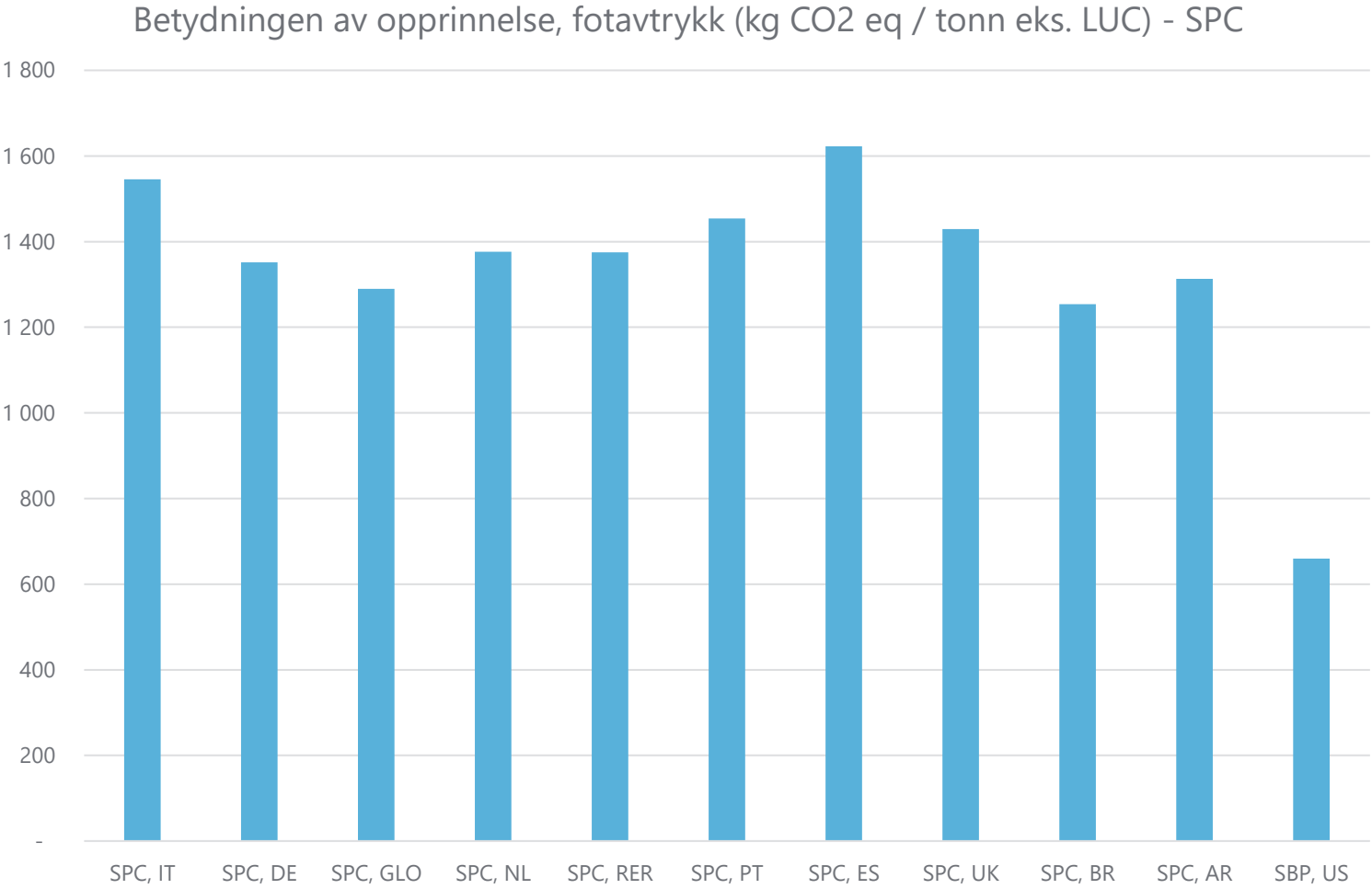
Norge 2020 vs. Polarfeed 2021



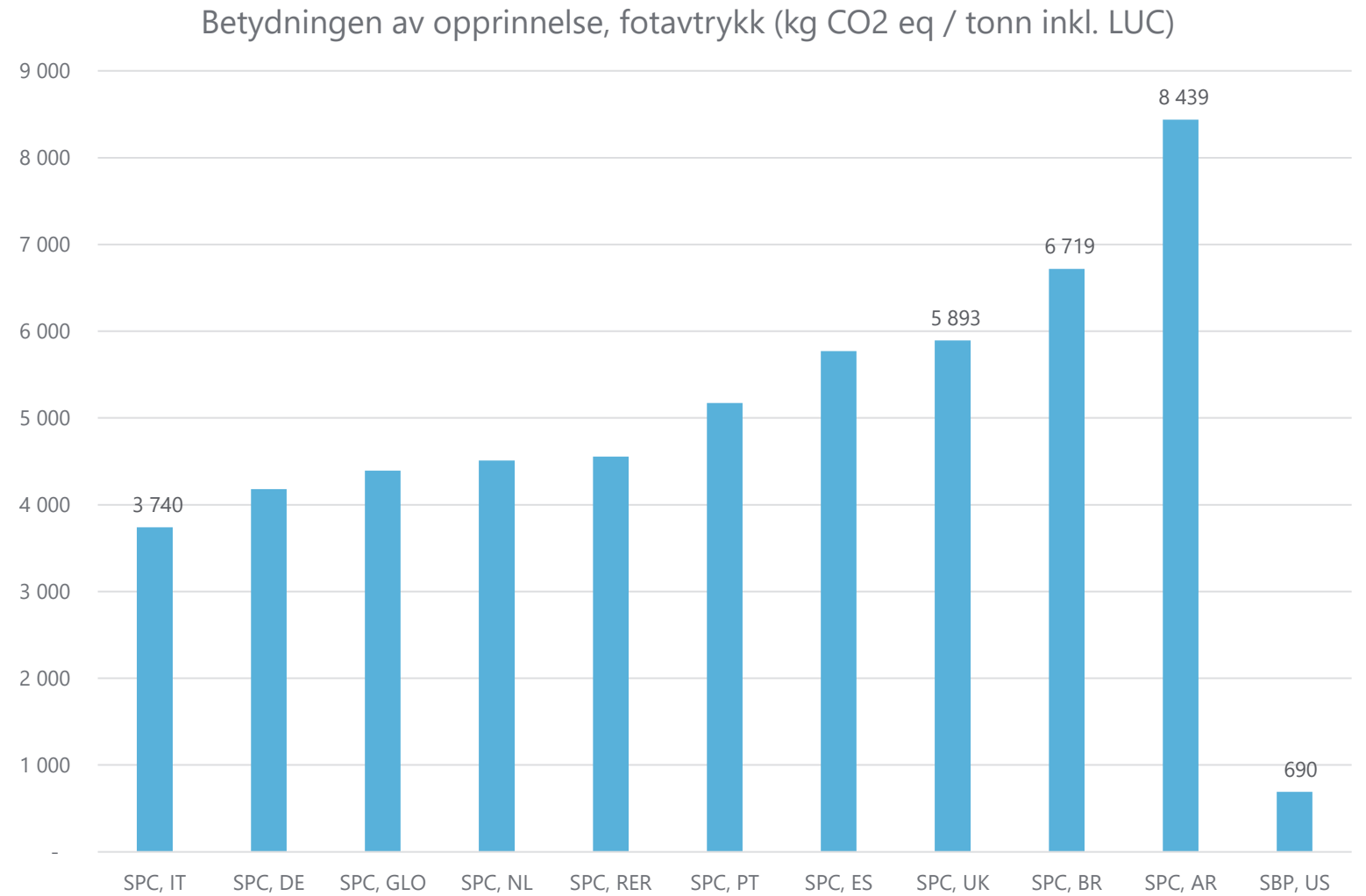
37% lavere fotavtrykk ved like forutsetninger

	Norge 2020	Polarfeed 2021
Marint protein	0,15	0,51
Marin olje	0,08	0,10
Vegetabilsk protein	1,86	0,72
Vegetabilsk olje	0,56	0,34
Karbohydratkilder	0,09	0,06
Annet/Mikro	0,05	0,04
SUM	2,80	1,76

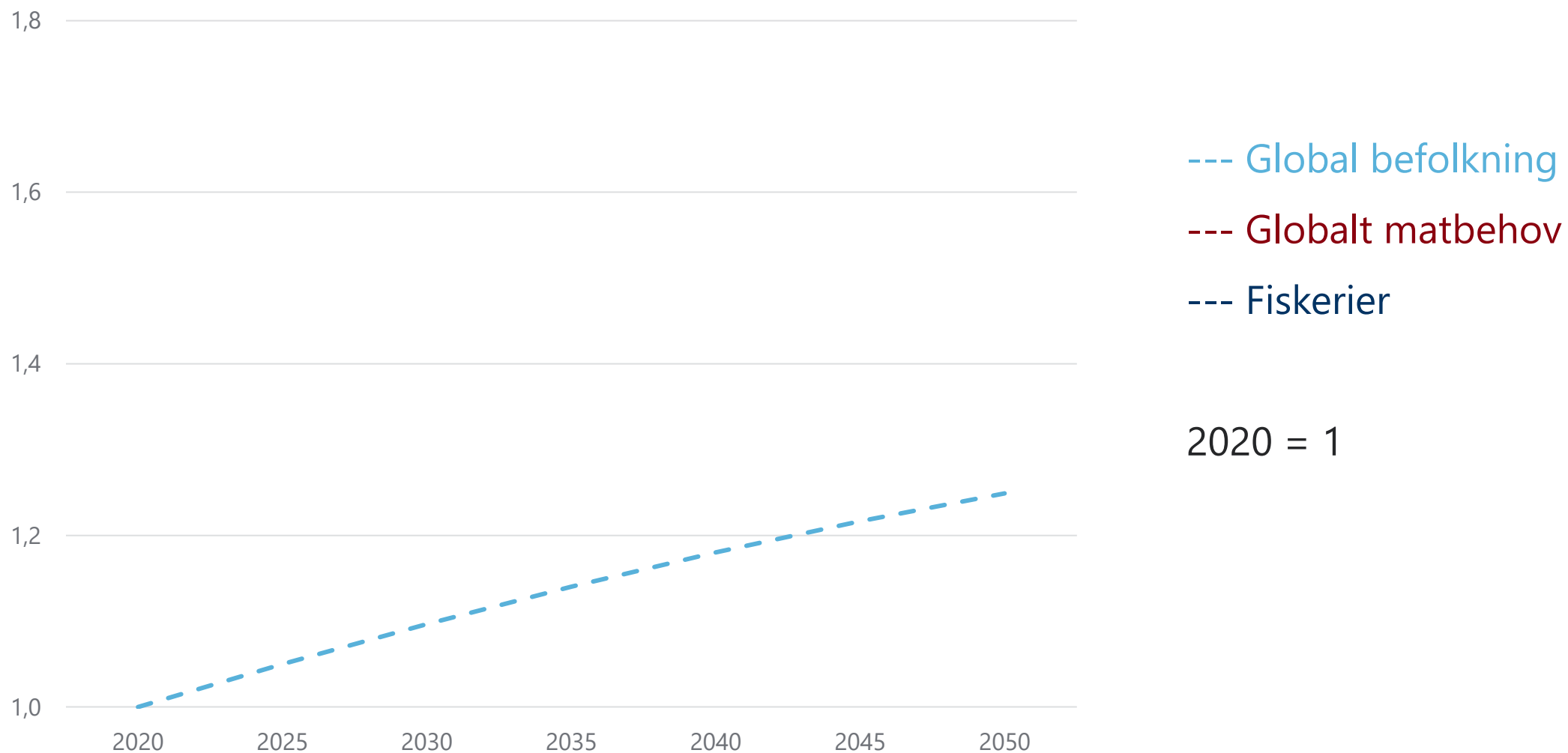
Råvaresourcing og fotavtrykk



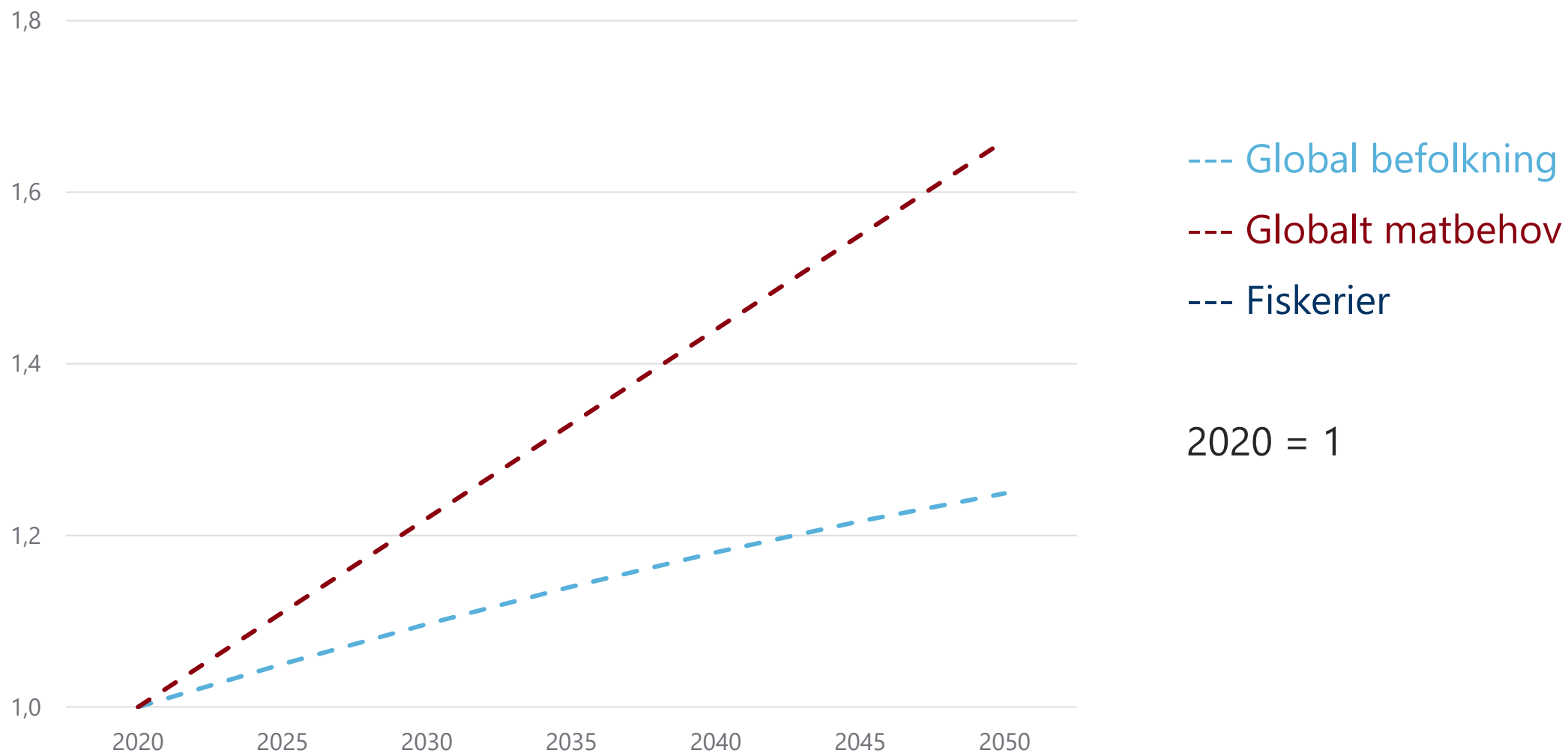
Råvaresourcing og fotavtrykk



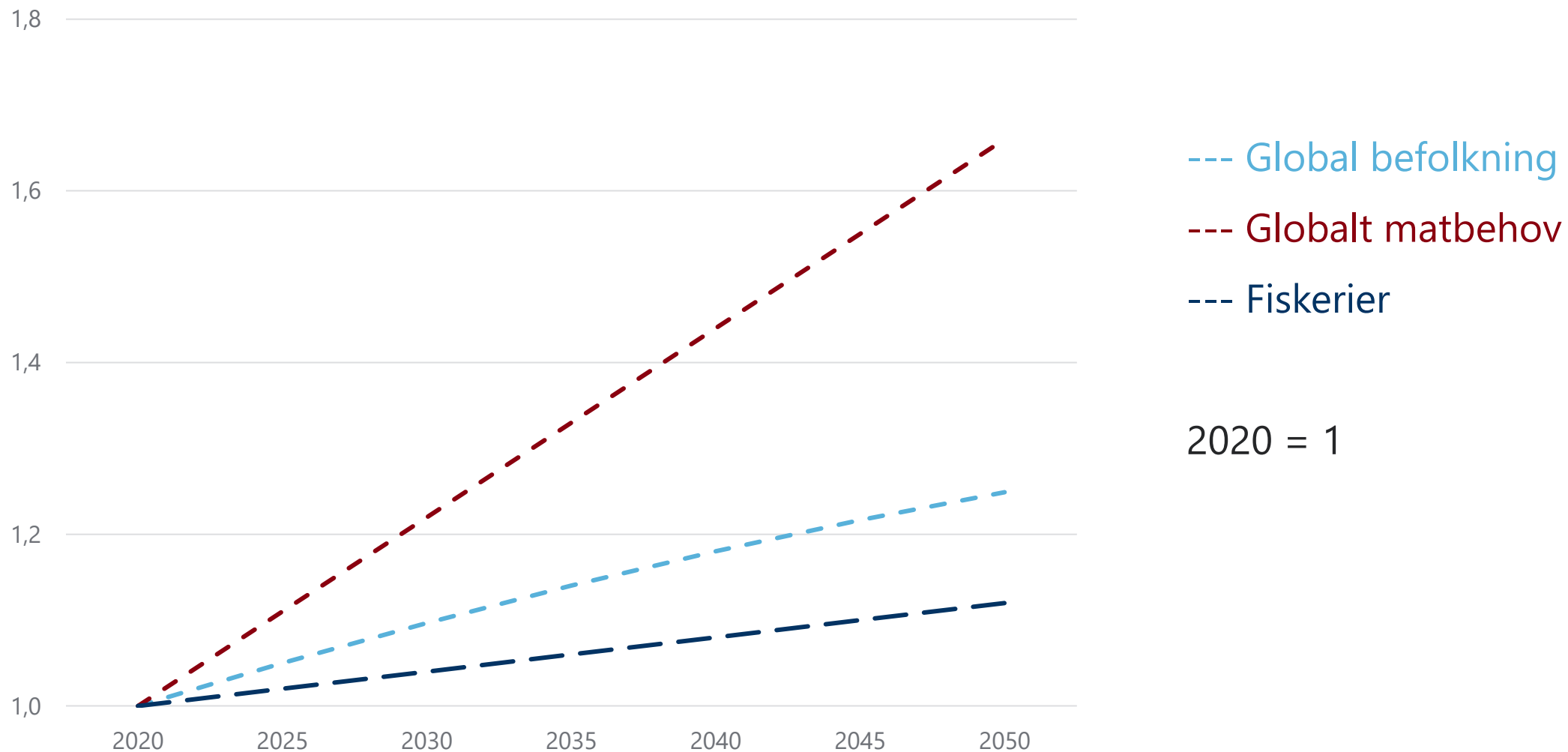
Det globale matbehovet frem mot 2050



Det globale matbehovet frem mot 2050

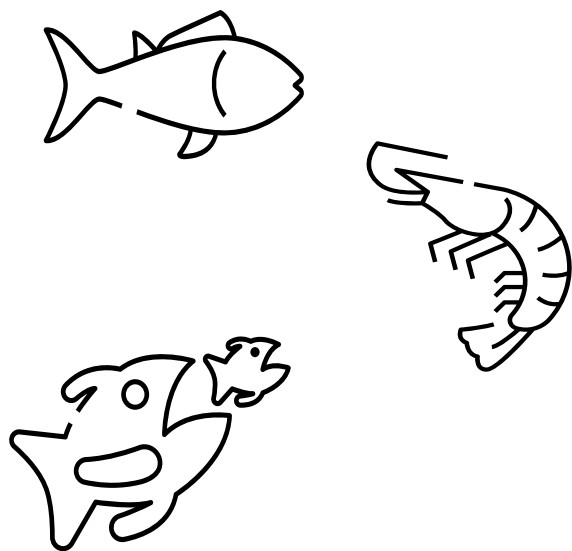


Det globale matbehovet frem mot 2050

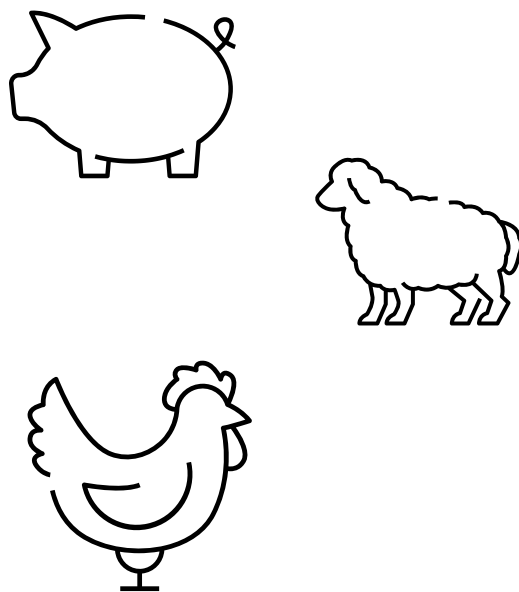


“Riktig” sluttbruker av råvarer?

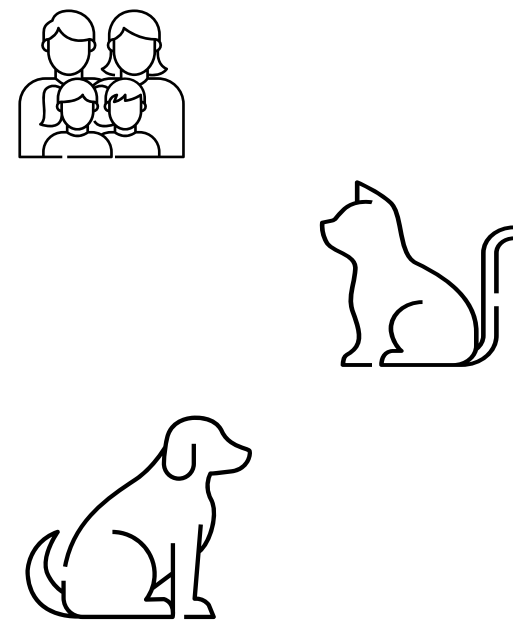
Akvakulturarter



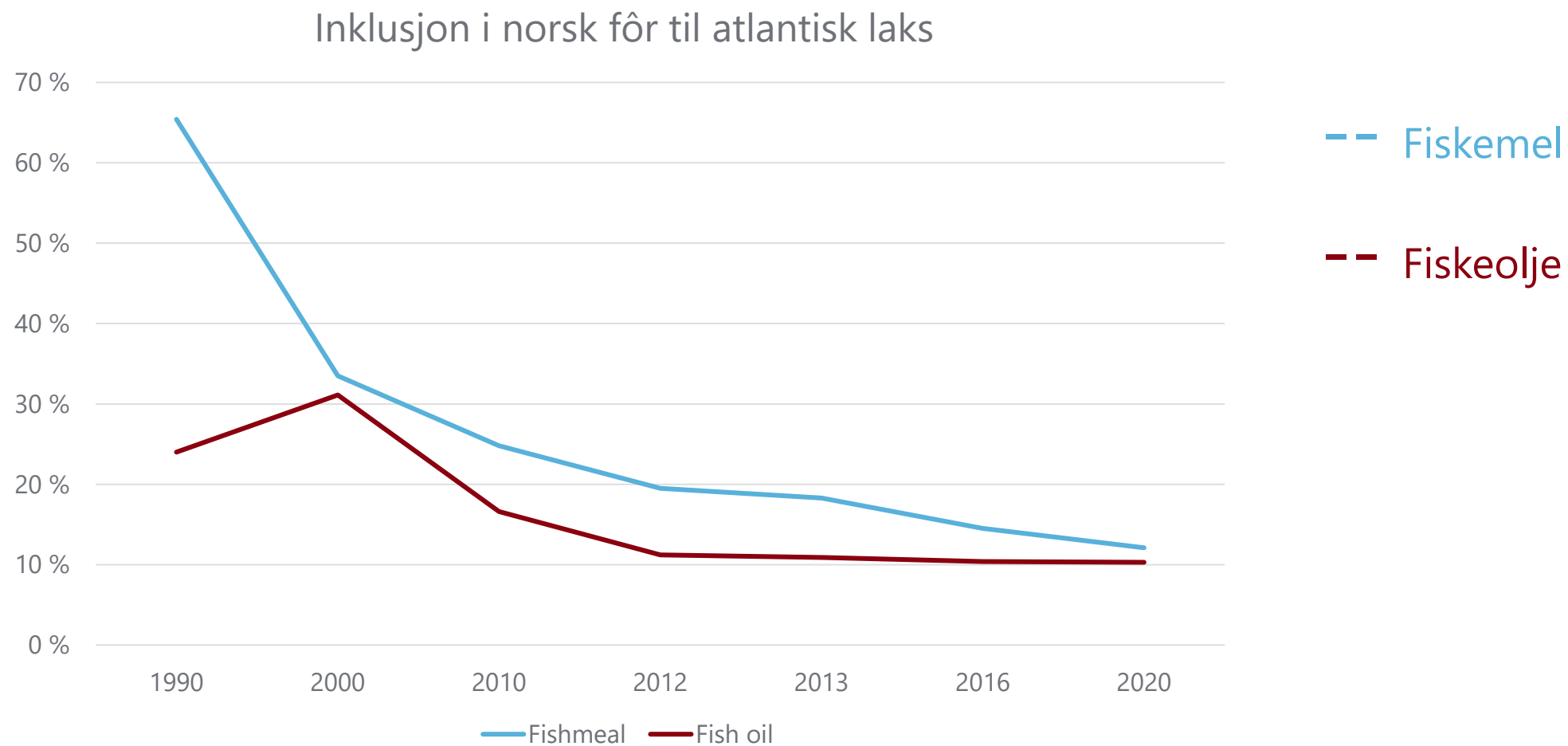
Husdyr og fjørfe



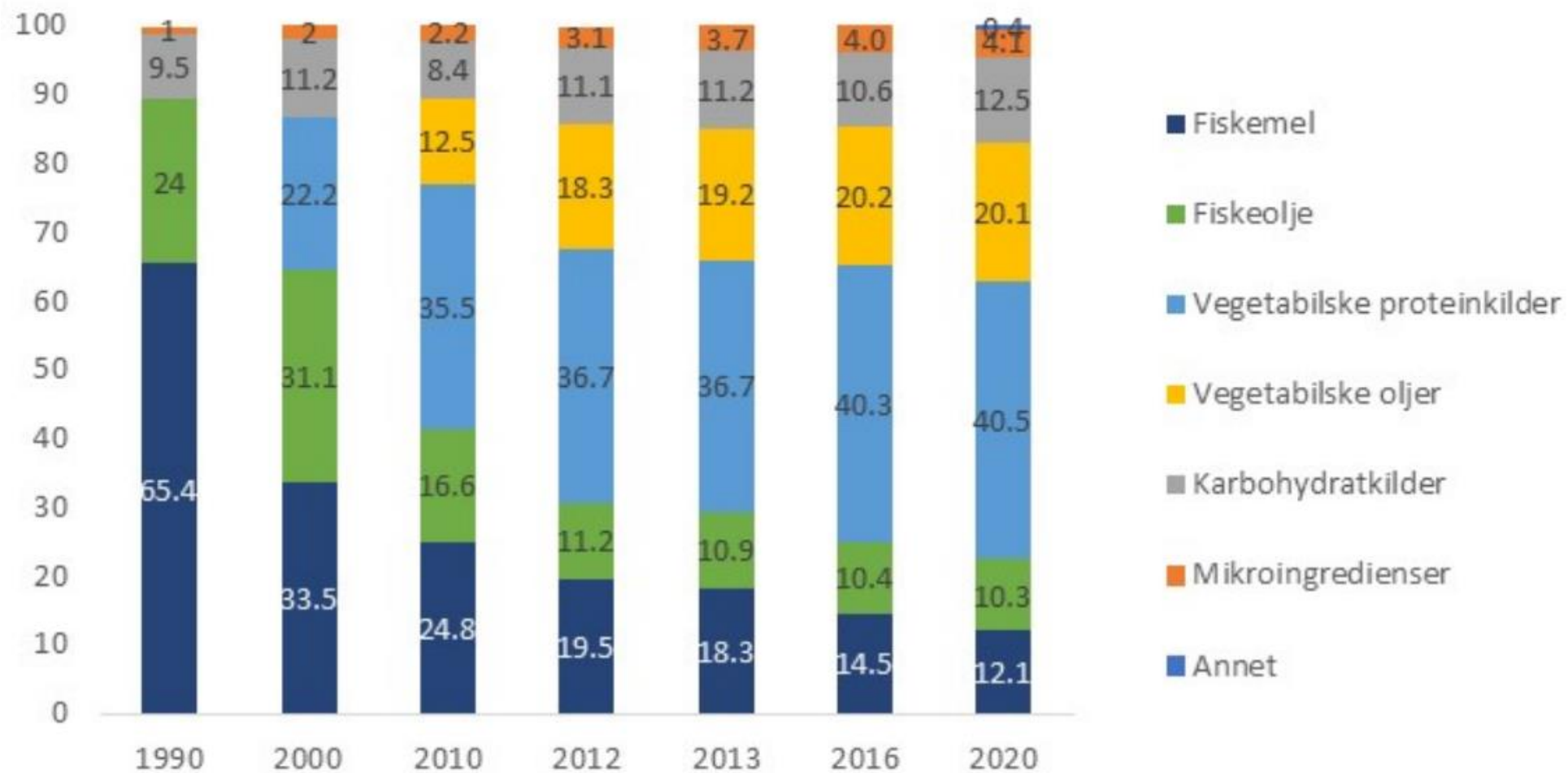
Andre brukere



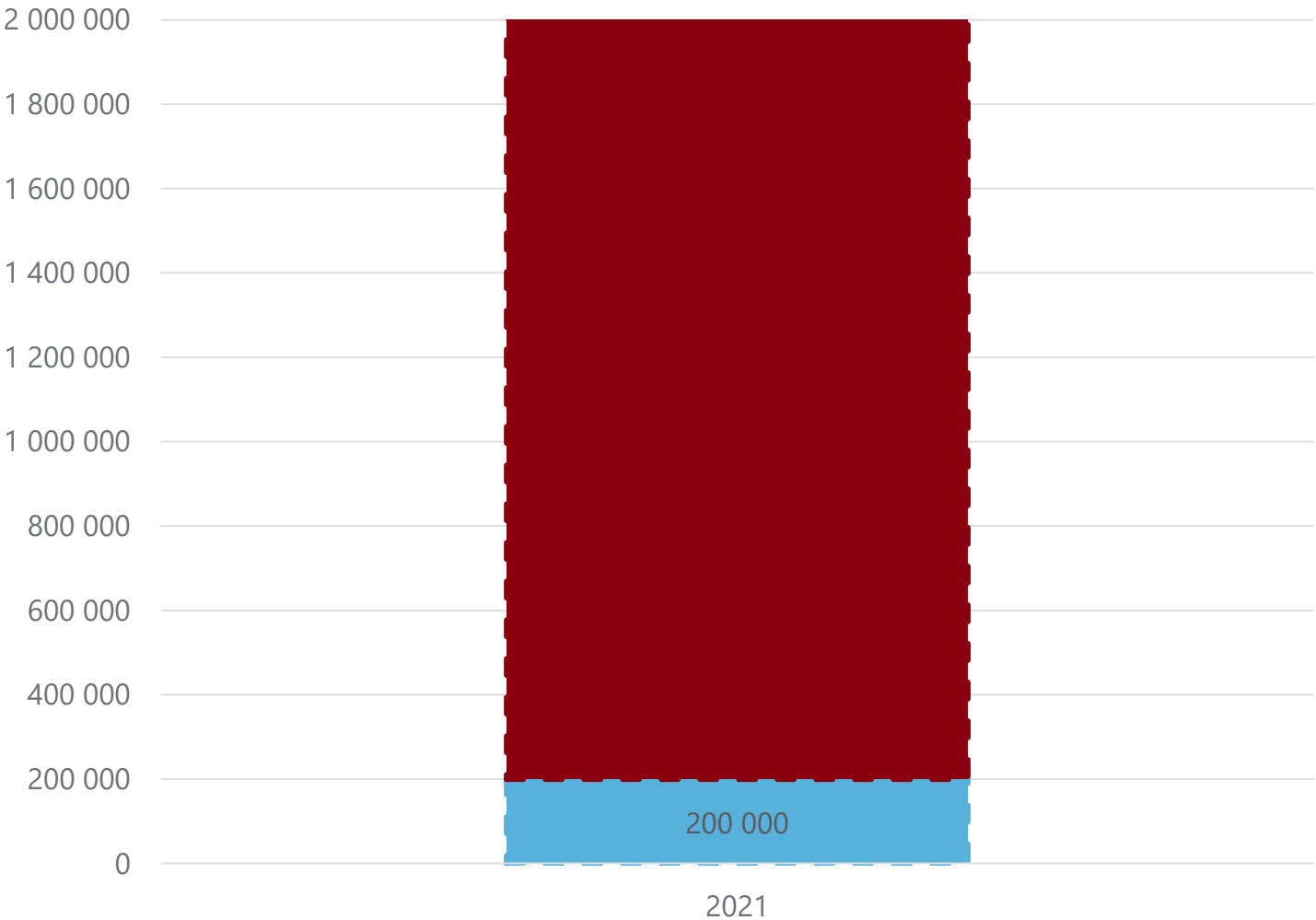
Fiskemel og fiskeolje



Det gjennomsnittlige laksefôret i 2020 i Norge

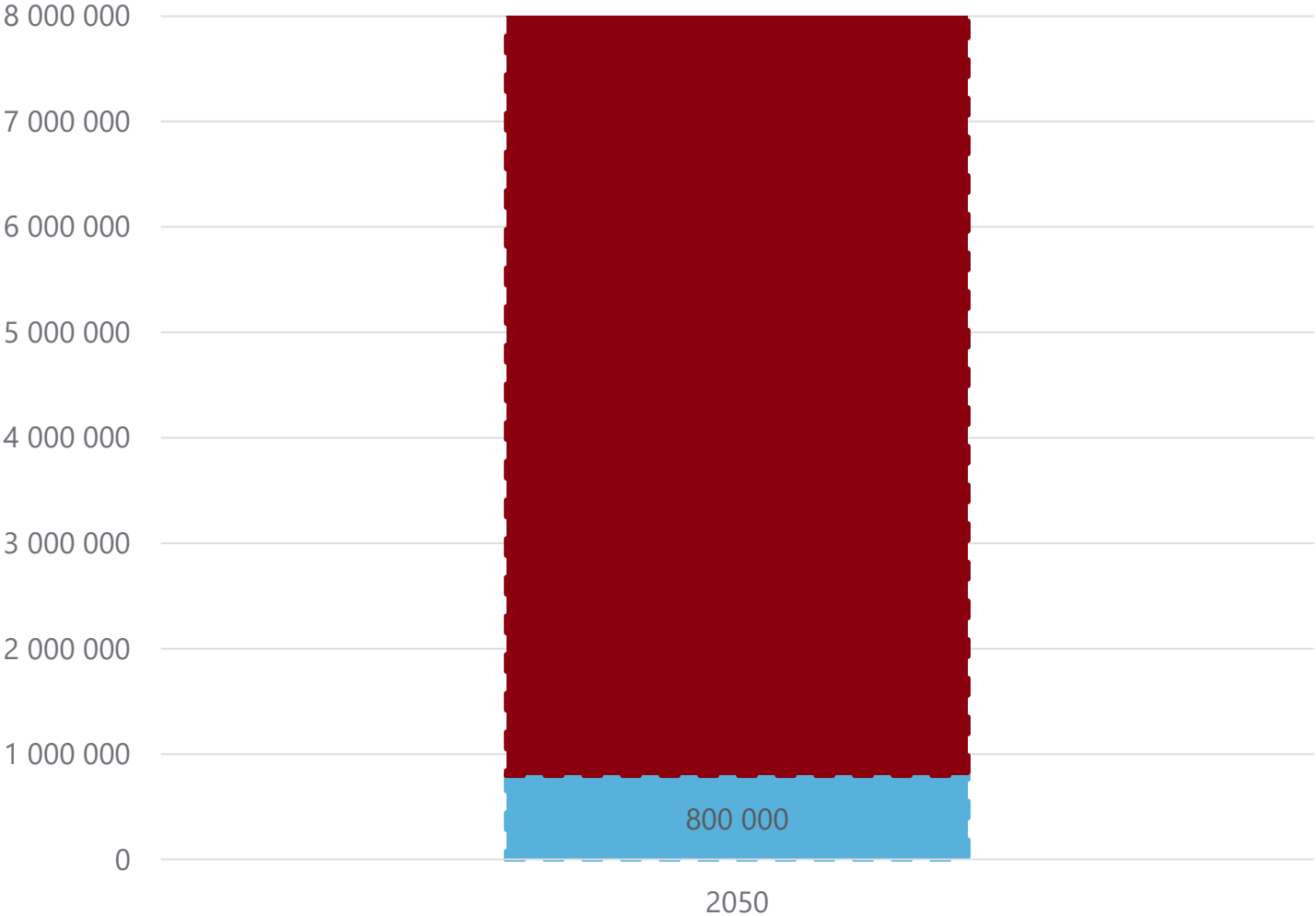


Dagens utfordring



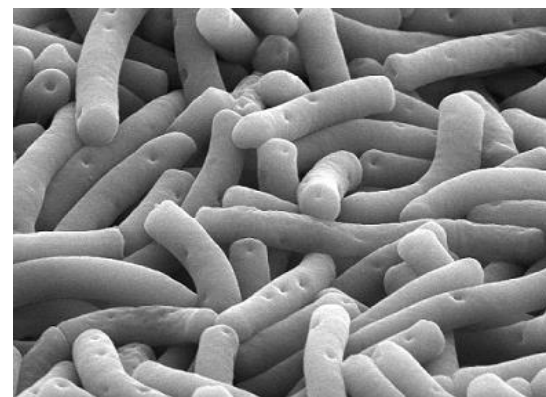
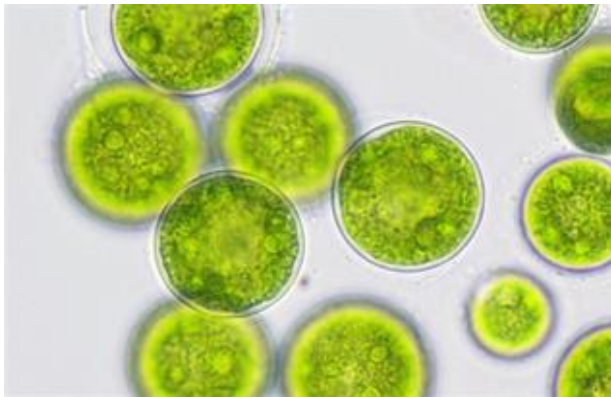
10% = 200 000 tonn

Fremtidens utfordring

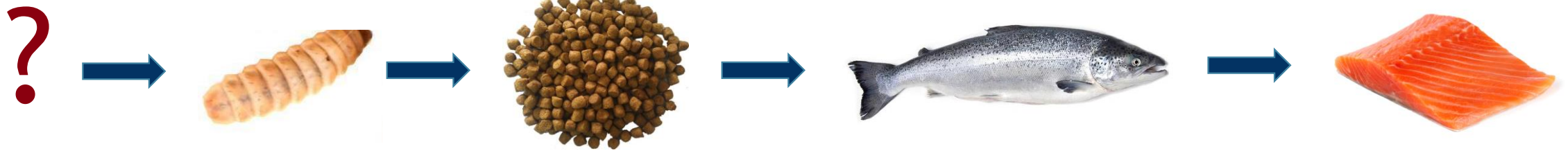


10% = 800 000 tonn

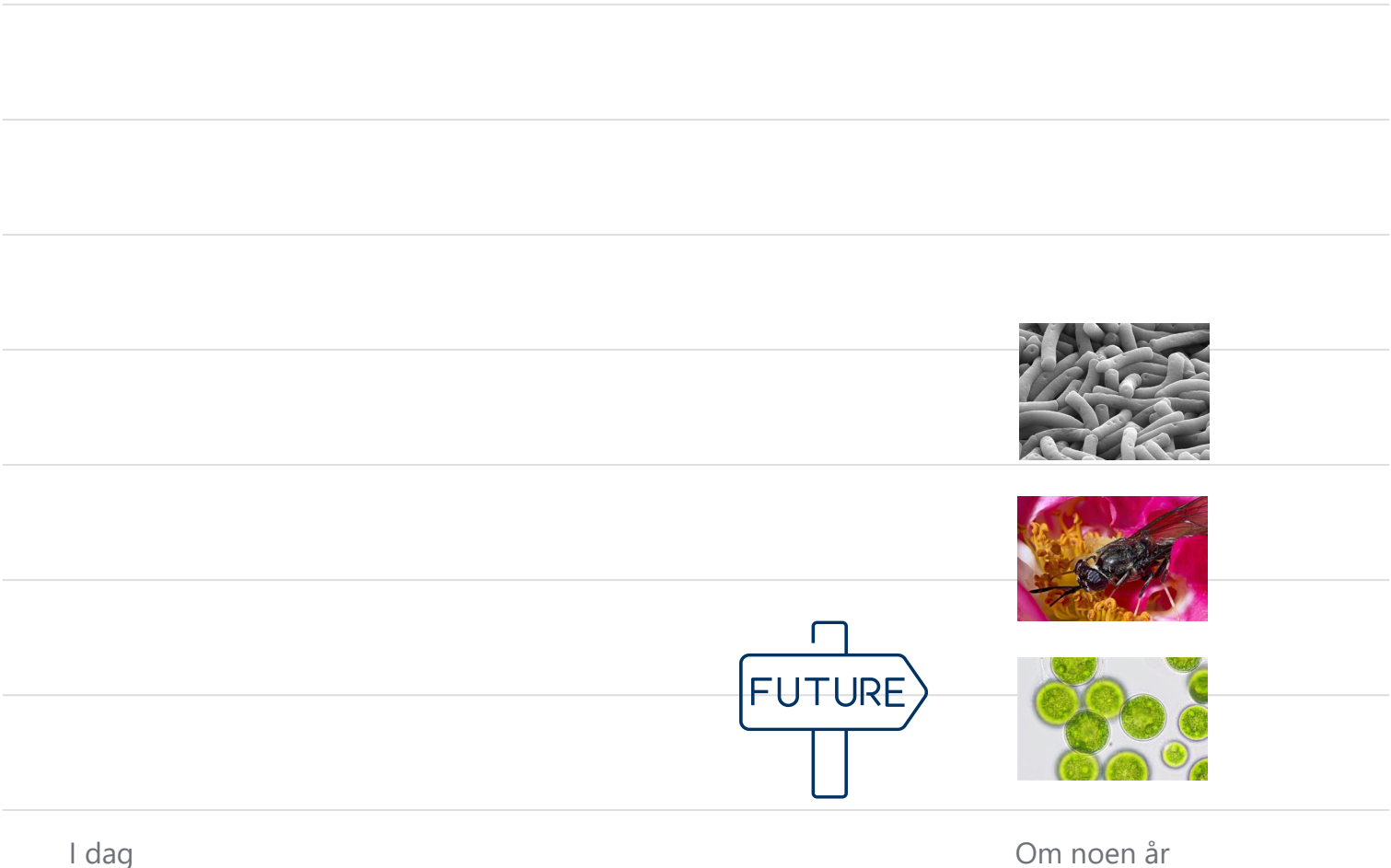
Nye råvarer



Dagens utfordring



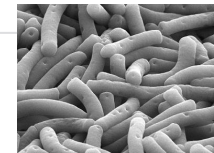
Vi ønsker nye råvarer, men...



Vi ønsker nye råvarer, men...



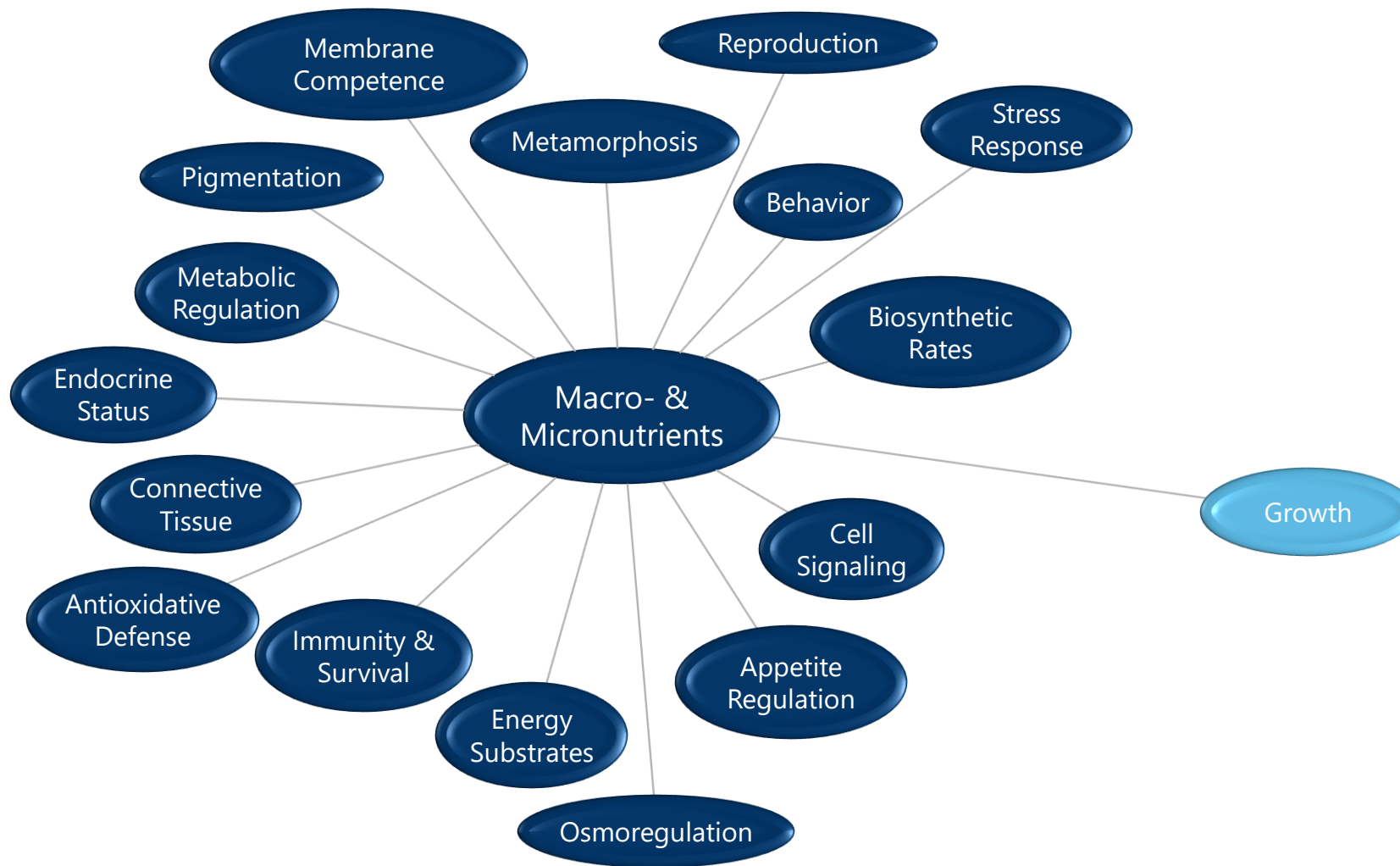
I dag



Om noen år

Trenger fisk *egentlig* marine råvarer?

Fisk trenger *næringsstoffer*, ikke råvarer



Det siste en fisk vil gjøre er å vokse

To hovedgrupper næringsstoffer

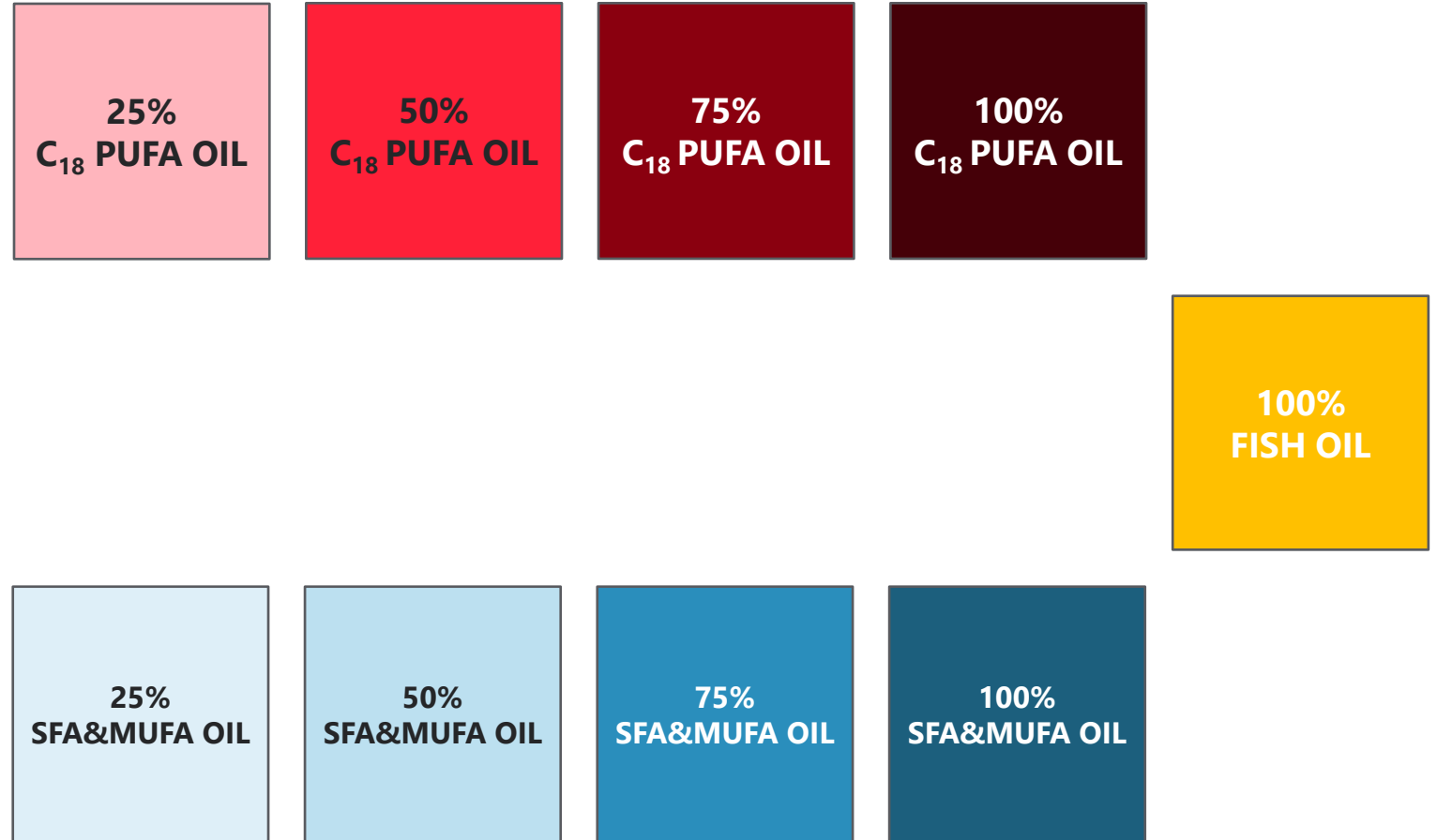
Fettsyrer

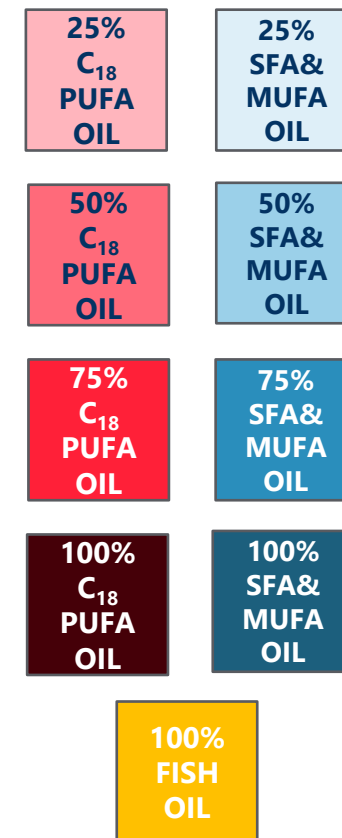
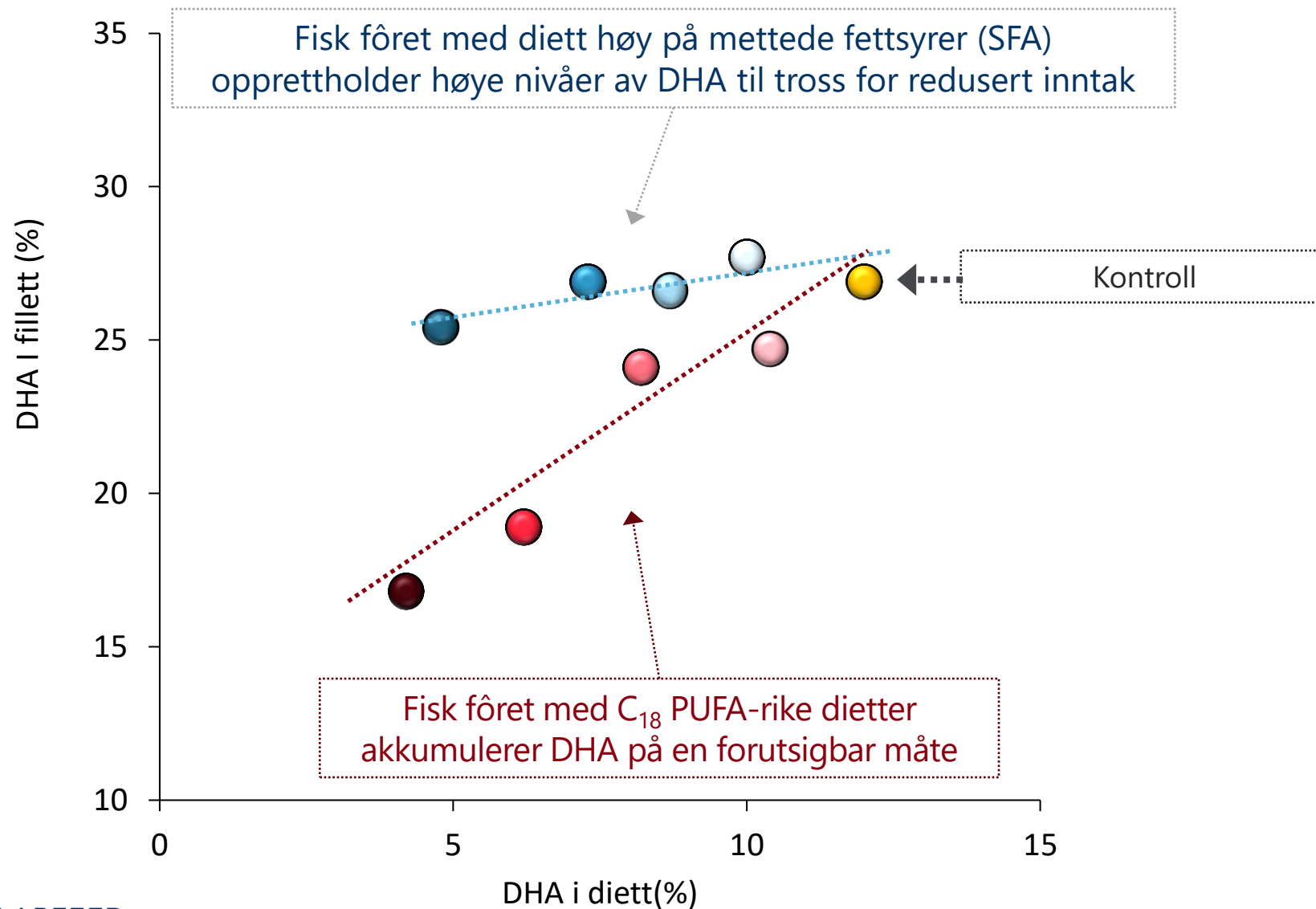
Protein

UTFORDRE

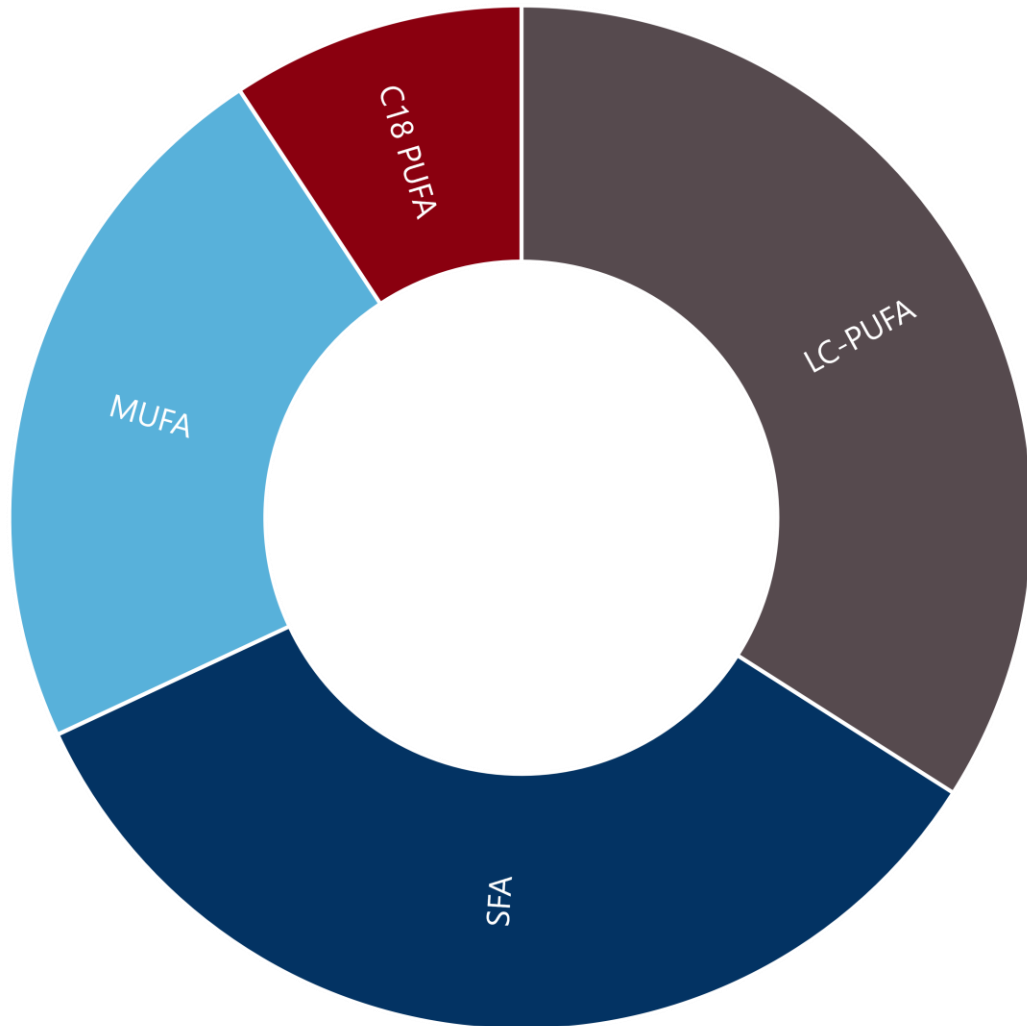
"FISKEN ER HVA DEN SPISER"

Oljesammensetning

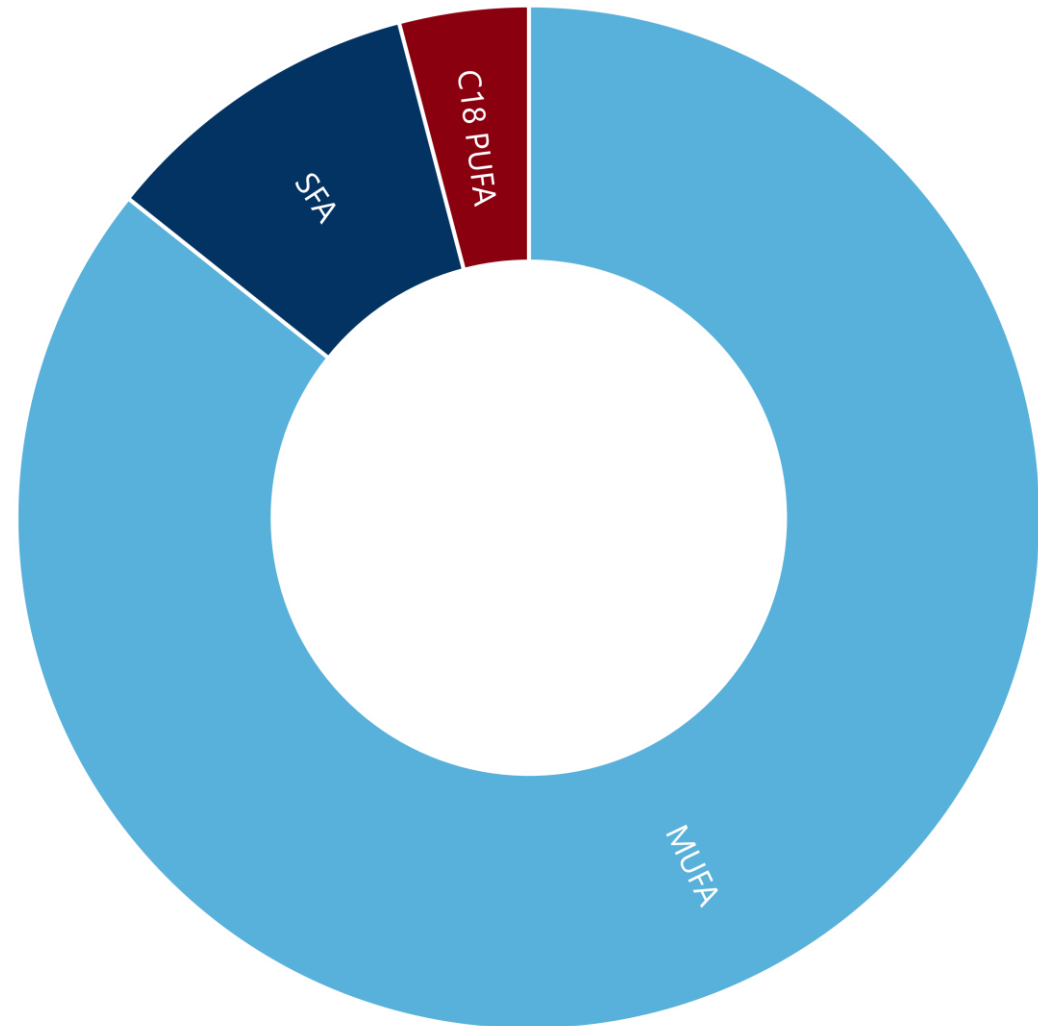




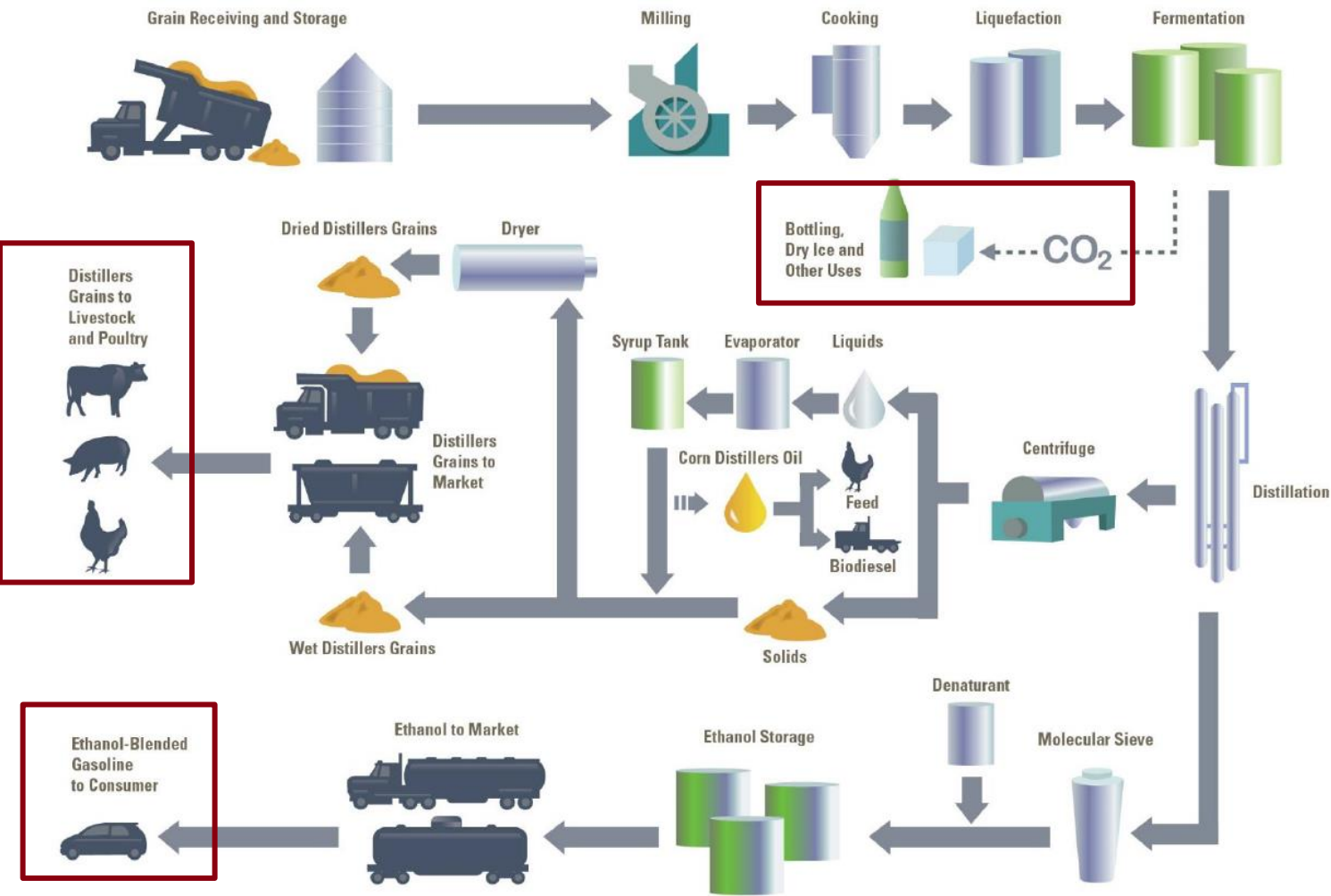
FISKEOLJE



SOLSIKKEOLJE



Increase Nutritional Value of DDGs



BIOFUELS

INDUSTRIAL USES (CO₂)

ANIMAL FEEDS

Can be refined to increase nutritional value for aquatic animals

Refined DDGs - MSC™ 50

 **12 Biorefineries**
Strategically throughout the United States

 **10 Million**
Tons of corn processed annually

 **Over 1 Billion Gallons**
Our annual production capacity of low-carbon biofuels

 **Over 700**
Dedicated employees



Nutrient (% DM)	Corn	MSC™ 50
Protein	8.8	49.0
Lysine	0.3	2.1
Methionine	0.2	1.1
Tryptophan	0.1	0.5
Threonine	0.3	2.1
Isoleucine	0.3	2.1
Leucine	1.1	5.9
	0.4	2.6
Phenylalanine		
Valine	0.4	2.7
Histidine	0.3	1.4
Arginine	0.4	2.5
Starch	61.6	4.4
Fiber	10.0	16
Ash	1.2	4.8
Lipid	3.8	2.0

Refined DDGs - MSC™ 50

**12 Biorefineries**
Strategically throughout the United States

**10 Million**
Tons of corn processed annually

**Over 1 Billion Gallons**
Our annual production capacity of low-carbon biofuels

**Over 700**
Dedicated employees



Nutrient (% DM)	Corn	MSC™ 50
Protein	8.8	49.0
Lysine	0.3	2.1
Methionine	0.2	1.1
Tryptophan	0.1	0.5
Threonine	0.3	2.1
Isoleucine	0.3	2.1
Leucine	1.1	5.9
	0.4	2.6
Phenylalanine		
Valine	0.4	2.7
Histidine	0.3	1.4
Arginine	0.4	2.5
Starch	61.6	4.4
Fiber	10.0	16
Ash	1.2	4.8
Lipid	3.8	2.0

TRINN FOR IMPLEMENTERING



Akseptabelt
Gjennomførbart
Økonomisk
Tilgjengelig

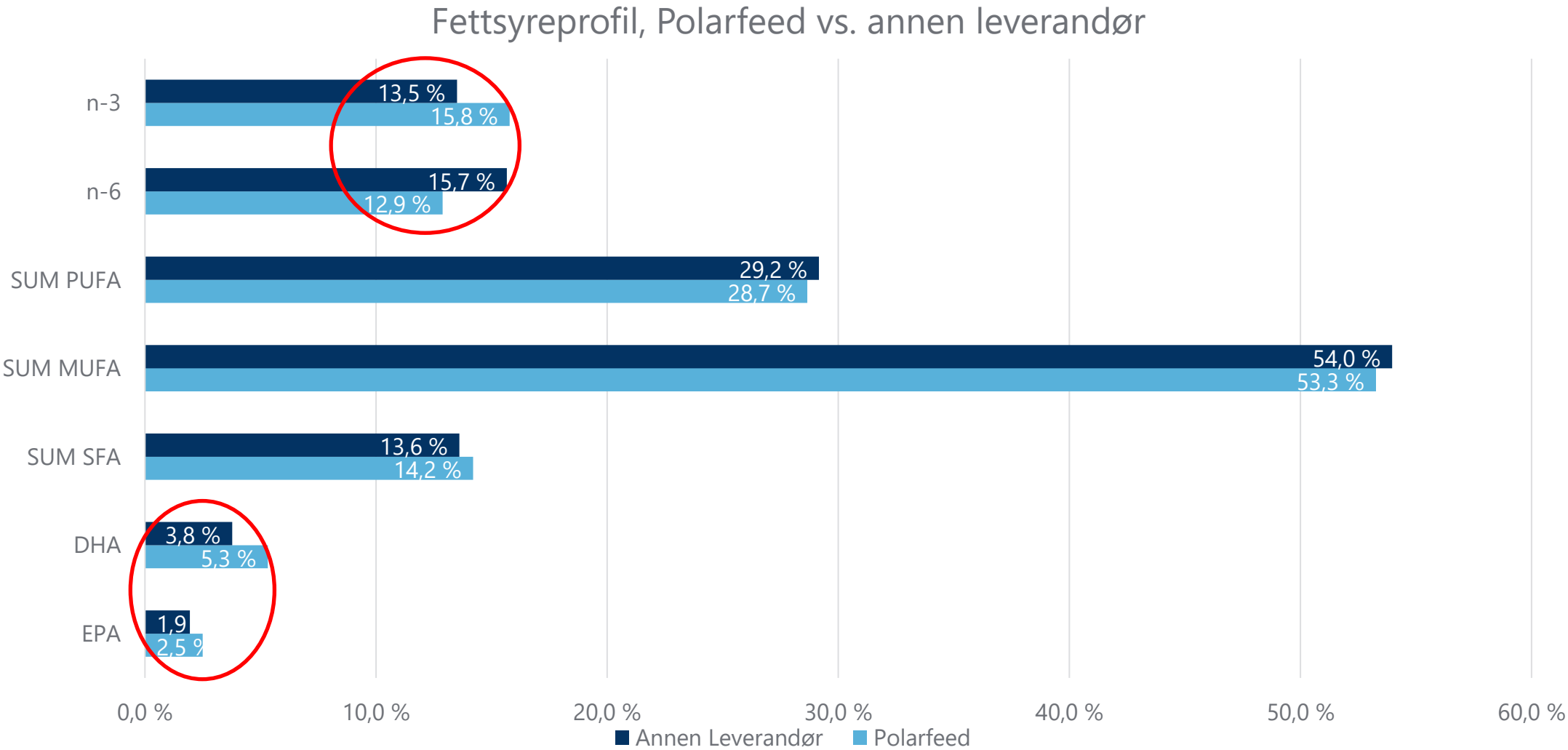


Fiskehelse

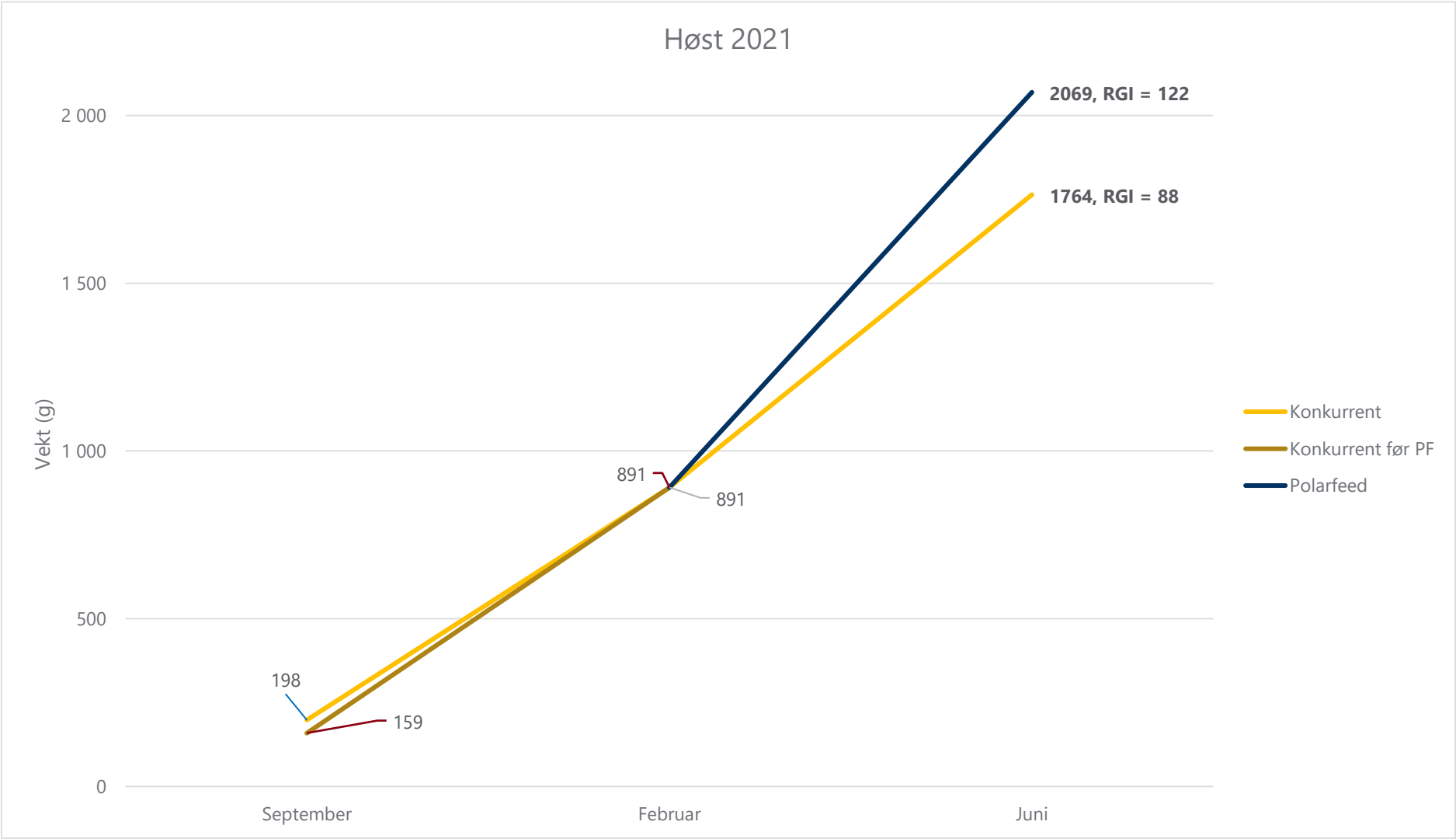
Tilvekst

Kvalitet

Et godt fôr gir god fiskehelse



Et godt fôr gir god tilvekst



Et godt fôr gir topp kvalitet



Takk for meg 😊

