Hvordan er våre matvalg forbundet med helse og forventet levalder?

Resulter fra Food4HealthyLife

Lars T. Fadnes

Professor, University of Bergen

Bakgrunn

- Globalt er kosthold anslått å forårsake 11 millioner dødsfall og 255 million tapte leveår/år

- Global Burden of Disease studien og EAT-Lancet med flere gir noen befolkningsanslag på hva som hva som er gunstige kostholdsmønstre, men gir begrenset informasjon om hva en kan forvente av gevinster av ulike matvalg

En jungel av forskning

Publisert >1,5 millioner vitenskapelige artikler relatert til kosthold og ernæring ved (desembe 2022)

Hvordan kan en finne fram i jungelen av studier?

Hvilken tilnærminger kan vi ha?

Food4HealthyLife (https://food4healthylife.org)

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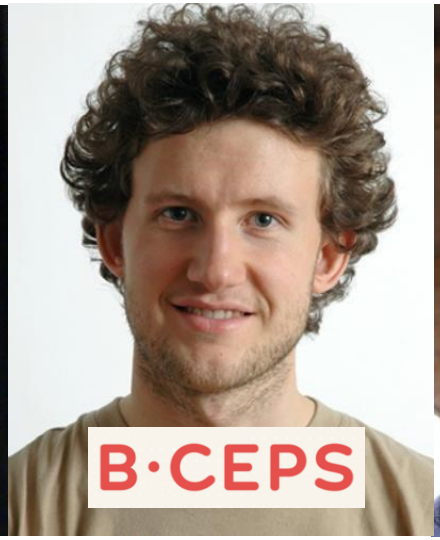

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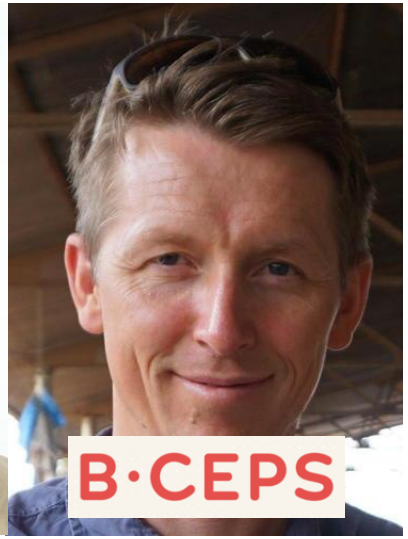

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RESEARCH ARTICLE

Estimating impact of food choices on life expectancy: A modeling study

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Abstract

Background

Interpreting and utilizing the findings of nutritional research can be challenging to clinicians, policy makers, and even researchers. To make better decisions about diet, innovative methods that integrate best evidence are needed. We have developed a decision support model that predicts how dietary choices affect life expectancy (LE).

Methods and findings

Based on meta-analyses and data from the Global Burden of Disease study (2019), we used life table methodology to estimate how LE changes with sustained changes in the intake of fruits, vegetables, whole grains, refined grains, nuts, legumes, fish, eggs, milk/dairy, red meat, processed meat, and sugar-sweetened beverages. We present estimates (with 95% uncertainty intervals [95% UIs]) for an optimized diet and a feasibility approach diet. An optimal diet had substantially higher intake than a typical diet of whole grains, legumes, fish, fruits, vegetables, and included a handful of nuts, while reducing red and processed meats, sugar-sweetened beverages, and refined grains. A feasibility approach diet was a midpoint between an optimal and a typical Western diet. A sustained change from a typical Western diet to the optimal diet from age 20 years would increase LE by more than a decade for women from the United States (10.7 [95% UI 8.4 to 12.3] years) and men (13.0 [95% UI 9.4 to 14.3] years). The largest gains would be made by eating more legumes (females: 2.2 [95% UI 1.1 to 3.4]; males: 2.5 [95% UI 1.1 to 3.9]), whole grains (females: 2.0 [95% UI 1.3 to 2.7]; males: 2.3 [95% UI 1.6 to 3.0]), and nuts (females: 1.7 [95% UI 1.5 to 2.0]; males: 2.0 [95% UI 1.7 to 2.3]), and less red meat (females: 1.6 [95% UI 1.5 to 1.8]; males: 1.9 [95% UI 1.7 to 2.1]) and processed meat (females: 1.6 [95% UI 1.5 to 1.8]; males: 1.9 [95% UI 1.7 to 2.1]). Changing from a typical diet to the optimized diet at age 60 years would increase LE by 8.0 (95% UI 6.2 to 9.3) years for women and 8.8 (95% UI 6.8 to 10.0) years for men, and 80-year-olds would gain 3.4 years (95% UI females: 2.6 to 3.8/ males: 2.7 to 3.9). Change from typical to feasibility approach diet would increase LE by 6.2 (95% UI 3.5 to 8.1) years for 20-year-old women from the United States and 7.3 (95% UI 4.7

uib.no/en/med/151413/food-pattern-calculator-estimates-how-gain-ten-life-years

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NEWS

Food pattern calculator estimates how to gain up to ten life years

Researchers at UiB have developed a calculator that can estimate how many life years you could gain by modifications in diet patterns.

Nuts, whole grain and legumes are food groups that are strongly associated with longer life expectancy. Photo: Colourbox

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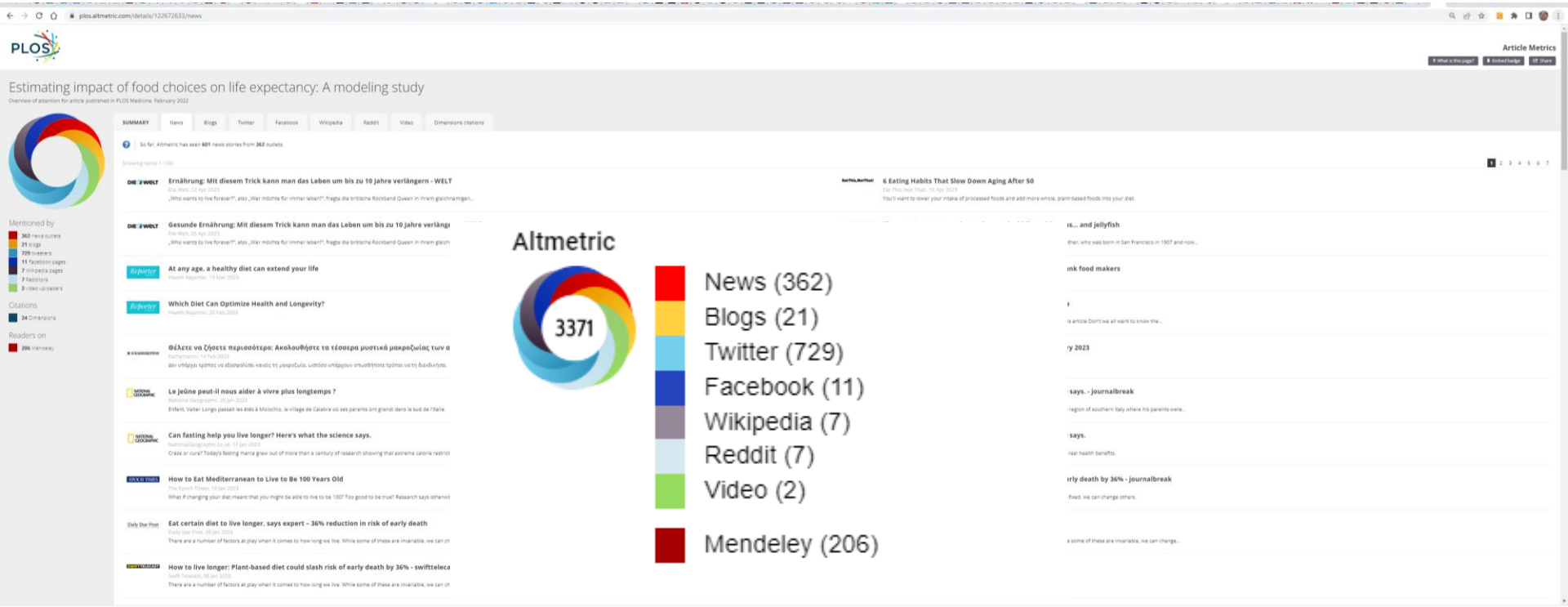

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Metode

Har benyttet

- meta-analyser,
- Global Burden of Disease studien (2019)

Kombinert disse med overlevelses-tabell metoder og presenterer usikkerhetsestimater for optimalisert og gjennomførbare kostholdsendringer

Metode 1: Meta-analyser

oppdaterte

tisk

alvs

heng mellom

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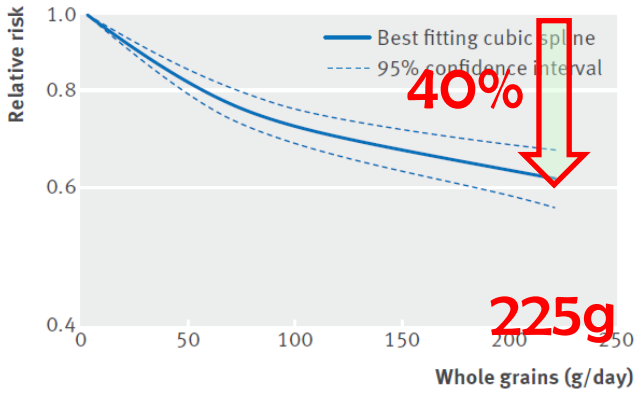

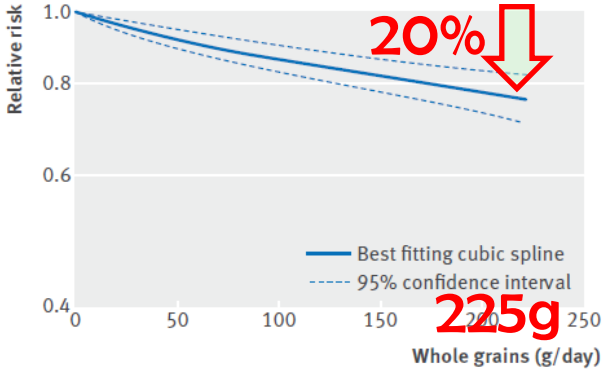

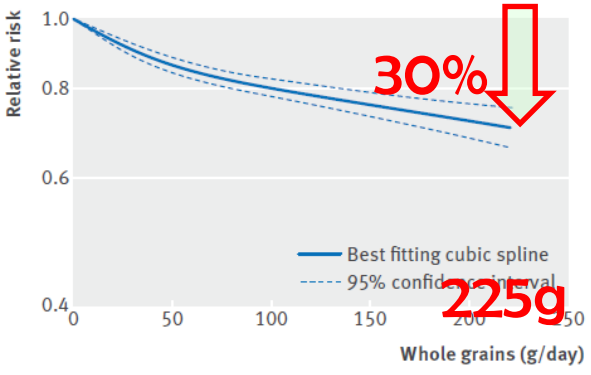

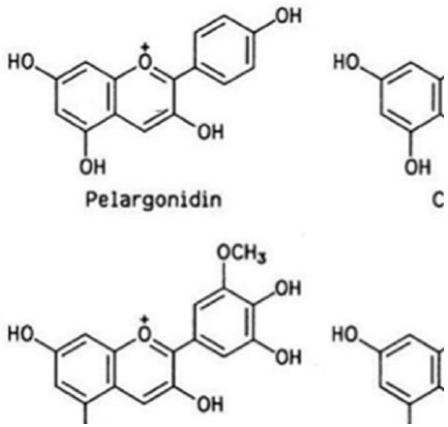

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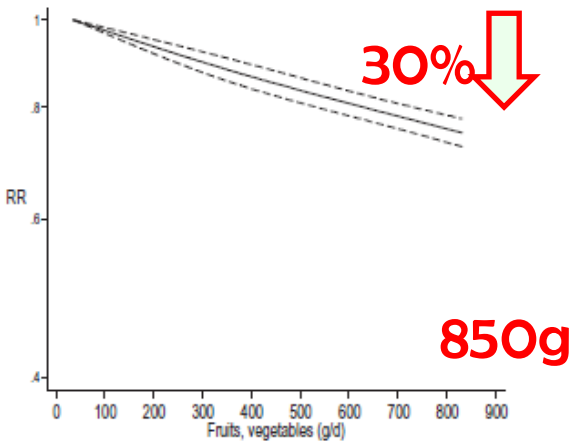

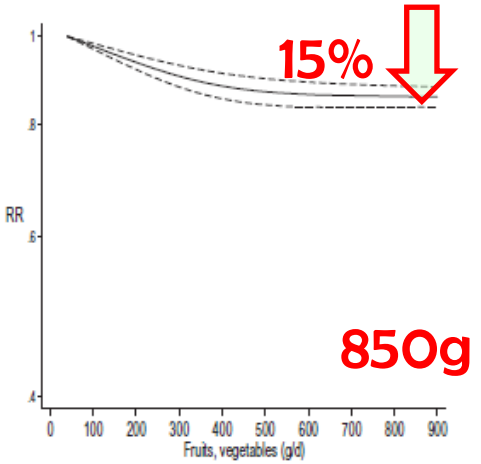

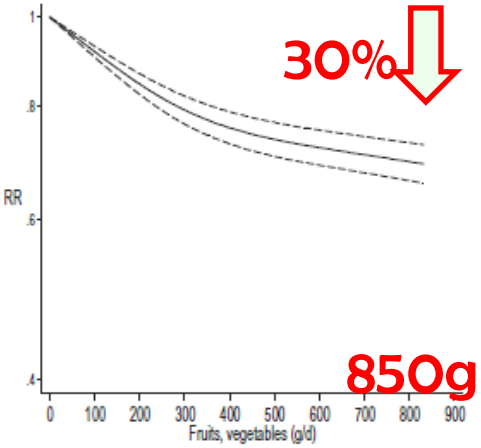

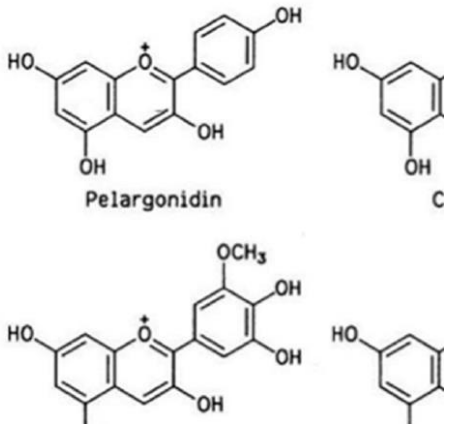

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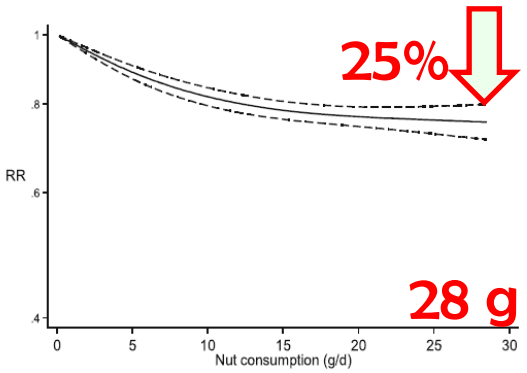

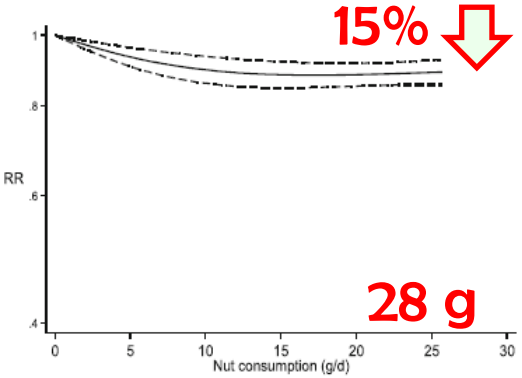

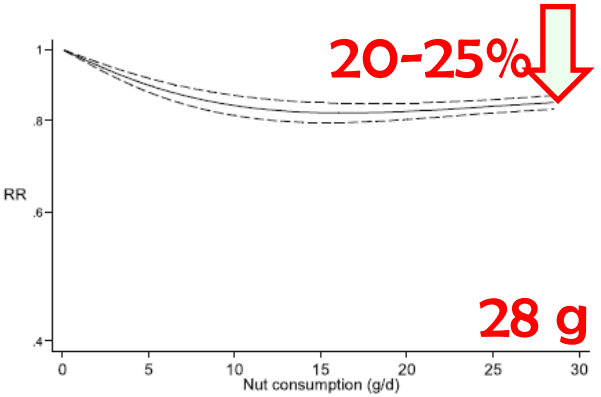

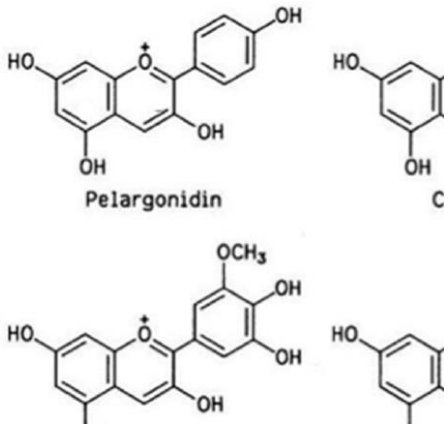

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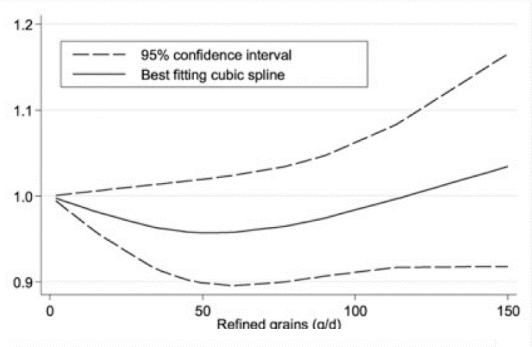
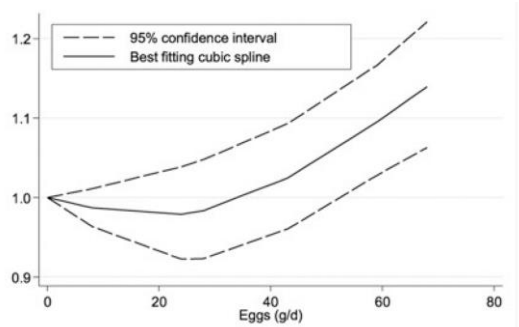
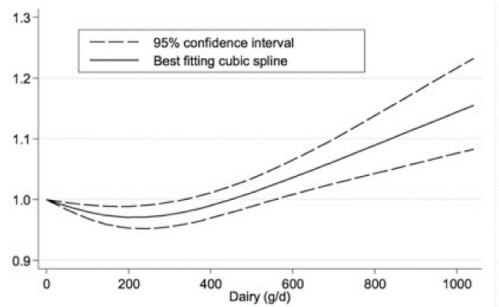
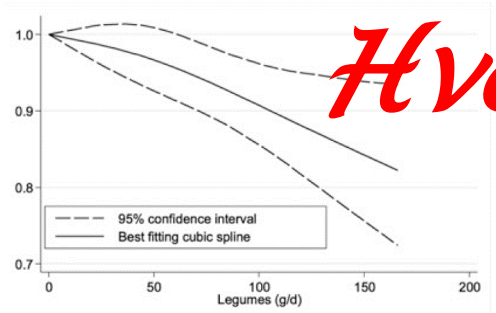
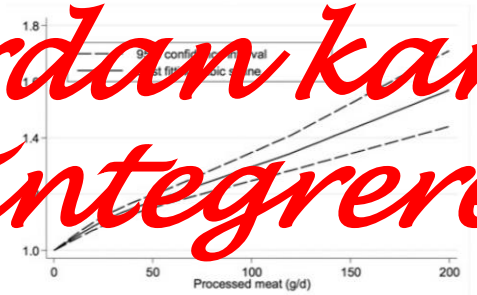
Andre matvaregrupper



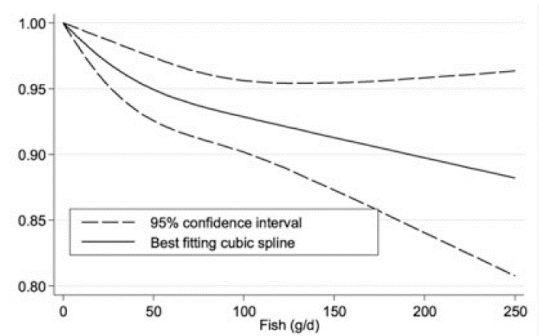


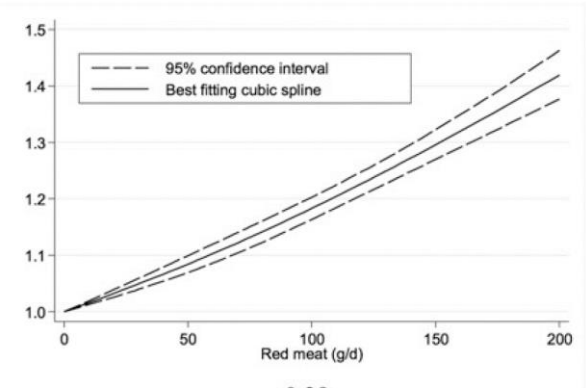






Hvordan kan disse integreres?





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Eksempler på ekstraherte data (meta-analyser)

Table S1: Hazard ratios (with uncertainty intervals) for various food groups with uncertainty limits (orange/red labels). Reference intake and energy levels per food groups are also indicated.

	Intake in grams/day																		Standard diet		Optimized		Norway patterns		US patterns	
Grams	0	25	50	100	150	200	250	300	400	500	600	700	800	Uncertainty threshold	No estimate threshold	Publication	kJ/g	Examples of food	kJ/100 g	‰ / 100 kJ	Sliders start	Energy (kJ)	Optimized	Energy (kJ)	Norway, mean intake	Energy (kJ)	US, mean intake	Energy (kJ)
Whole grains	1	0,935	0,87	0,8	0,76	0,72	0,7	0,7	0,72	0,72	0,8	0,8	0,87	300		Aune. Whole grain consumpt	4	Oat meal,	400	0,50	50	200	250	1000	61	244	30	122
- Mid to u +/-1			0,01	0,02	0,03	0,04	0,05	0,06	0,08	0,1	0,12	0,14	0,16															
Cllower			0,86	0,78	0,73	0,68	0,65	0,64	0,64	0,62	0,68	0,66	0,71															
Clupper			0,88	0,82	0,79	0,76	0,75	0,76	0,8	0,82	0,92	0,94	1,03															
Veg	1	0,965	0,93	0,87	0,835	0,8	0,785	0,77	0,76	0,76	0,75	0,75	0,75	700		Aune. Fruit and vegetable int	2	Salad incl	200	0,50	250	500	450	900	255	510	249	497
- Mid to upper/lower			0,015	0,025	0,04	0,05	0,05	0,05	0,05	0,05	0,06	0,07	0,08															
Fruit	1	0,97	0,94	0,89	0,865	0,84	0,83	0,82	0,81	0,81	0,81	0,82	0,84	700		Aune suppl. 164 (F&veg)	1,5	Oranges,	150	0,53	200	300	400	600	244	366	184	276
- Mid to upper/lowe	0	0	0,005	0,01	0,015	0,02	0,025	0,03	0,035	0,04	0,05	0,06	0,07															
Nuts	1	0,84	0,86	0,9	0,95									50	200	Aune. Nut consumption and r	26	Pea nuts	2600	0,25	0	0	25	650	11	286	11	284
- Mid to upper/lower		0,02	0,04	0,08	0,12																							
Legumes	1			0,9		0,8		0,75	0,72	0,71	0,72			250	625	Schwingshackl. Food groups a	5	Boiled chi	500	0,20	0	0	200	1000	6	30	9	43
- Mid to upper/lower		0,015	0,03	0,05	0,075	0,1	0,125	0,15	0,2	0,25	0,3																	
Fish	1		0,95	0,93		0,9	0,88	0,86	0,86	0,88	0,9			300	625	Schwingshackl. Food groups a	6	Mackerel,	600	0,12	50	300	200	1200	82	492	17	99
- Mid to upper/lower		0,02	0,025	0,03	0,04	0,06	0,08	0,12	0,16	0,2	0,25																	
Egg	1	0,98	1,05	1,3		1,5								100	225	Schwingshackl. Food groups a	6	Egg, boile	600	0,13	50	300	25	150	36	216	44	264
- Mid to upper/lower		0,06	0,06	0,07	0,1	0,15																						
Milk	1			0,985		0,97		0,98	0,99	1,015	1,04	1,065	1,09			Schwingshackl. Food groups a	1,7	Milk, 1% f	170	0,09	300	510	200	340	225	383	434	737
- Mid to upper/lower		0,01	0,015	0,015	0,0175	0,02	0,02	0,02	0,02	0,025	0,03	0,035	0,04															
Refined grains	1		0,94	0,98	1,03	1,09	1,16	1,24	1,4	1,57				200	525	Schwingshackl. Food groups a	11	Bread wit	1100	0,11	150	1650	50	550	172	1892	159	1753
- Mid to upper/lower		0,03	0,06	0,07	0,1	0,13	0,16	0,19	0,25	0,31																		
Meat, red	1	1,05	1,09	1,18	1,3	1,42	1,54	1,66	1,9	2,14	2,38			250	625	Schwingshackl. Food groups a	7	Cutlets, ch	700	-0,30	100	700	0	0	93	651	95	665
- Mid to upper/lowe	0	0,005	0,01	0,02	0,035	0,05	0,07	0,12	0,17	0,22	0,3																	
Meat, processed	1	1,1	1,18	1,3	1,43	1,57	1,71	1,85	2,13	2,41	2,69			250	625	Schwingshackl. Food groups a	19	Bacon	1900	-0,15	50	950	0	0	73	1387	53	1003
- Mid to upper/lowe	0	0,01	0,02	0,05	0,1	0,15	0,2	0,25	0,32	0,4	0,5																	
Meat, white	1	1	1	1	1	1	1	1	1					0	625	Abete. Association between t	10	Chicken le	1000	0,00	75	750	50	500	50	500	75	750
- Mid to upper/lowe	0	0,05	0,1	0,2	0,25	0,3	0,35	0,4	0,45		0,2																	
Sugar sweetened be	1	1,0075	1,015	1,03	1,045	1,06	1,07	1,08	1,1	1,12	1,14	1,16	1,18	400		Schwingshackl. Food groups a	2	Lemonad	200	-0,15	500	1000	0	0	425	850	621	1242
- Mid to upper/lowe	0	0,0125	0,025	0,05	0,055	0,06	0,065	0,07	0,08	0,09	0,1	0,11	0,14															
Added oils	1	1	1	1										0	225	Abdelhamid, A.S., et al., Polyu	37	Rapeseed	3700	0,14	25	925	25	925	30	1110	21	777
- Mid to upper/lowe	0	0,05	0,1	0,2																								
				Orange label: Uncertain estimates (moderate)				**Red label:** No estimate (very high uncertainty)								**Total estimates**					**1 800**	**8 085**		**7 815**	**1 763**	**8 917**		**8 512**

Metode 2: Bakgrunnsdata

- Populasjonsdata om dødsfall fra Global Burden of Disease (2019)
- Forventet levealder: antall år en person kan forventes å leve fra ulike grupper dersom de kommer opp til en viss alder
- Har Hentet data for USA, Storbritannia, Tyskland, Frankrike, Kina, Norge, Iran, med flere

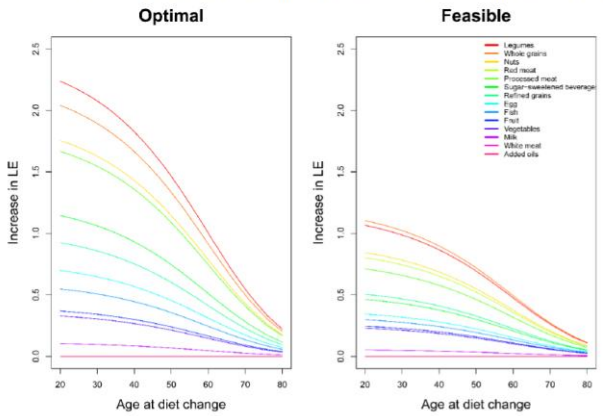
Metode 3: Effektforsinkelse

- Helsegevinster fra kosthold er relatert til reduksjon i kardiovaskulær sykdom, kreft, og diabetes, samt færrige tidlige dødsfall blant annet fra disse. Kan anta full effekt etter 10-20 år med gradvis økning i effekt før dette

- Tilleggs (sensitivitets) analyser for 5, 30 og 50 år

Table S3: Absolute and relative change in life expectancy with delay to full effects of 10 (default), 5, 30 and 5 year-old females and males from the United States.

			Absolute change (years)				Relative change (proportion)			
Age	Sex	Estimate	10-year	5-year	30-year	50-year	10-year	5-year	30-year	50-year
20	Female	10.7	0	0.1	-0.4	-1.3	0	0.01	-0.04	-0.12
20	Male	13.0	0	0.2	-0.9	-2.2	0	0.02	-0.07	-0.17
40	Female	10.0	0	0.2	-1.2	-3.4	0	0.02	-0.12	-0.34
40	Male	11.7	0	0.3	-1.8	-4.7	0	0.03	-0.15	-0.40
60	Female	8.0	0	0.5	-2.8	-5.3	0	0.06	-0.35	-0.66
60	Male	8.8	0	0.8	-3.6	-6.1	0	0.09	-0.41	-0.69
80	Female	3.4	0	1.2	-2.4	-2.8	0	0.35	-0.71	-0.82
80	Male	3.4	0	1.3	-2.4	-2.9	0	0.38	-0.71	-0.85



Metode 4: Usikkerhet

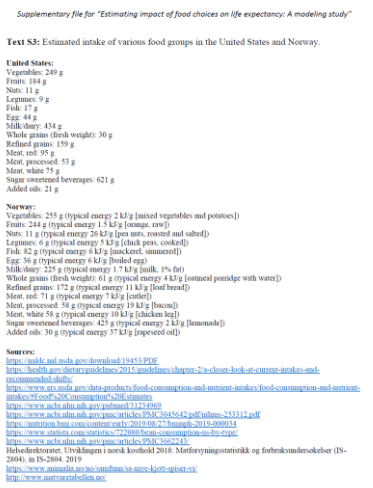
Vi beregnet usikkerhet basert på konfidensintervaller med Monte Carlo simulering

Metode 5: Overlapp

1. Selv om meta-analyser ofte justerer for flere andre matvaregrupper, er det mulig en har noe gjenstående forvekslingsfaktorer relatert til andre matvaregrupper. Tok hensyn til dette med å ta hensyn til ulike grader av potensiell overlap i sensitivitetsanalyser

Metode 6: Matvaremønstre

- Vi estimerte ulike kostholdsmønstre som var forbundet med særlig gunstig leveutsikter,(OD) et typisk vestlig kosthold (TW) samt et "gjennomførbart kosthold" (FA) som var gjennomsnittet mellom disse).
- Fullkorn : TW 50g, FA 137.5g, OD 225g
- Grønnsaker: TW 250g, FA 325g, OD 400g
- Frukt: TW 200g, 300g, and OD 400g
- Nøtter: TW 0g, FA 12.5g, and OD 25g
- Belgvekster: TW 0g, FA 100g, and OD 200g
- Fisk: TW 50, FA 125g, and OD 200g
- Egg: TW 50g, FA 37.5g and OD 25g
- Melk: TW 300g, FA 250g, and OD 200g
- Raffinert korn: TW 150g, FA 100g, OD 50g
- Rødt kjøtt: TW 100, FA 50g, and OD 0g
- Bearbeidet kjøtt: TW 50g, FA 25g, OD 0g
- Hvitt kjøtt: TW 75g, FA 62.5g and OD 50g
- Sukret drikke: TW 500g, FA 250g, and OD 0g
- Tilsatte planteoljer: TW 25g, FA 25g, and OD 25g
- Energi estimatat 8085 kJ/day for TW, 7850 kJ/day for FA, 7615 kJ/day for OD.



Supplementary file for "Estimating impact of food choices on life expectancy: A modeling study"

Text S3: Estimated intake of various food groups in the United States and Norway.

United States:
Vegetables: 249 g
Fruits: 184 g
Nuts: 11 g
Legumes: 9 g
Fish: 17 g
Egg: 44 g
Milk/dairy: 434 g
Whole grains (fresh weight): 30 g
Refined grains: 159 g
Meat, red: 95 g
Meat, processed: 53 g
Meat, white 75 g
Sugar sweetened beverages: 621 g
Added oils: 21 g

Norway:
Vegetables: 255 g (typical energy 2 kJ/g [mixed vegetables and potatoes])
Fruits: 244 g (typical energy 1.5 kJ/g [orange, raw])
Nuts: 11 g (typical energy 26 kJ/g [pea nuts, roasted and salted])
Legumes: 6 g (typical energy 5 kJ/g [chick peas, cooked])
Fish: 82 g (typical energy 6 kJ/g [mackerel, simmered])
Egg: 36 g (typical energy 6 kJ/g [boiled egg])
Milk/dairy: 225 g (typical energy 1.7 kJ/g [milk, 1% fat])
Whole grains (fresh weight): 61 g (typical energy 4 kJ/g [oatmeal porridge with water])
Refined grains: 172 g (typical energy 11 kJ/g [loaf bread])
Meat, red: 71 g (typical energy 7 kJ/g [cutlet])
Meat, processed: 58 g (typical energy 19 kJ/g [bacon])
Meat, white 58 g (typical energy 10 kJ/g [chicken leg])
Sugar sweetened beverages: 425 g (typical energy 2 kJ/g [lemonade])
Added oils: 30 g (typical energy 37 kJ/g [rapeseed oil])

Sources:
https://nahle.nal.usda.gov/download/119453/PDF
https://health.gov/dietaryguidelines/2015/guidelines/chapter-2/a-closer-look-at-current-intakes-and-recommended-shifts/
https://www.ers.usda.gov/data-products/food-consumption-and-nutrient-intakes/food-consumption-and-nutrient-intakes/#:text=20Consumption%20Estimates
https://www.ncbi.nlm.nih.gov/pubmed/31234969
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https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3662245/
Helsedirektoratet. Utviklingen i norsk kosthold 2018: Matforsyningsstatistikk og forbruksundersøkelser (IS-2804). in IS-2804. 2019
https://www.matvaretabellen.no/

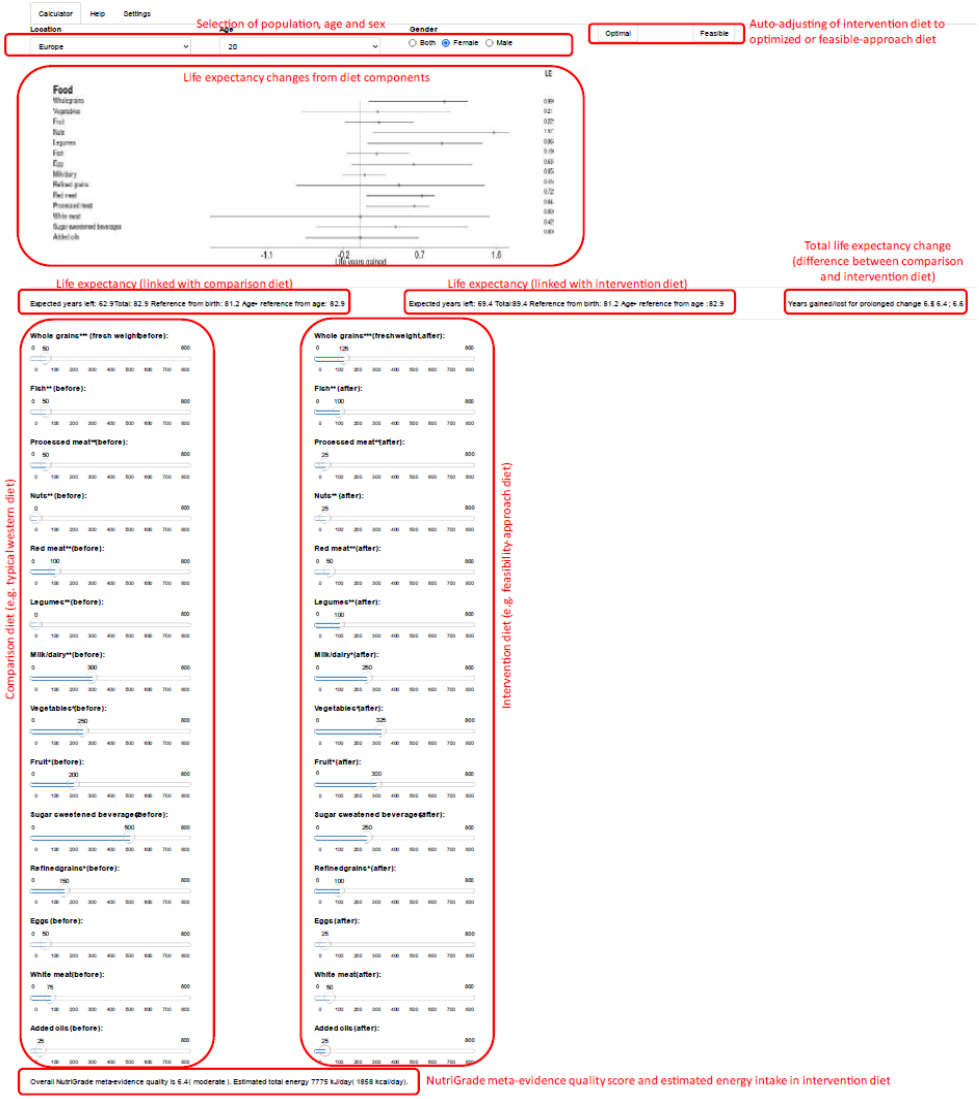
Metode 7: Evidens

- Gradering av evidens
- Evidensgrad var “høy” for fullkorn “moderat” for fisk, rødt og bearbeidet kjøtt, nøtter, beglvekster, melk, “lav” for grønnsaker, frukt, sukret drikke og raffinerte kornprodukter samt “veldig lav” for egg og hvitt kjøtt
- Total evidensgrad moderat
- Fleste metaanalysene hadde høy kvalitetsgrad (AMSTAR-2)

Metode 8: Analyser

- R Shiny med web applikasjon (http://food4healthylife.org/)

https://food4healthylife.org



Whole grains*** (fresh weight,before):

Fish** (before):

Processed meat**(before):

Nuts** (before):

Red meat**(before):

Legumes**(before):

Whole grains***(freshweight,after):

Fish** (after):

Processed meat**(after):

Nuts** (after):

Red meat**(after):

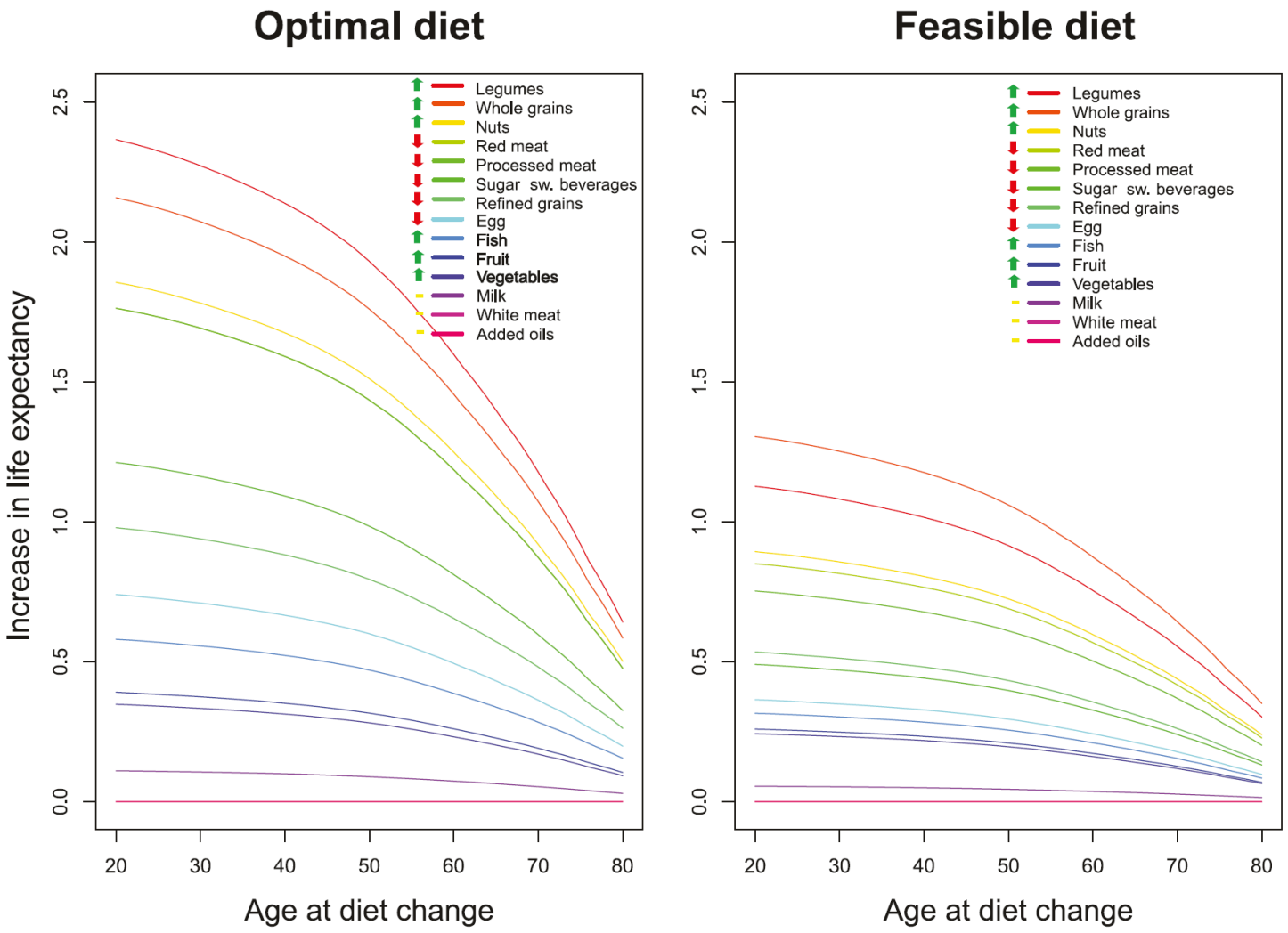
Legumes** (after):

Overall NutriGrade meta-evidence quality is 6.4(moderate). Estimated total energy 7775 kJ/day(1858 kcal/day).

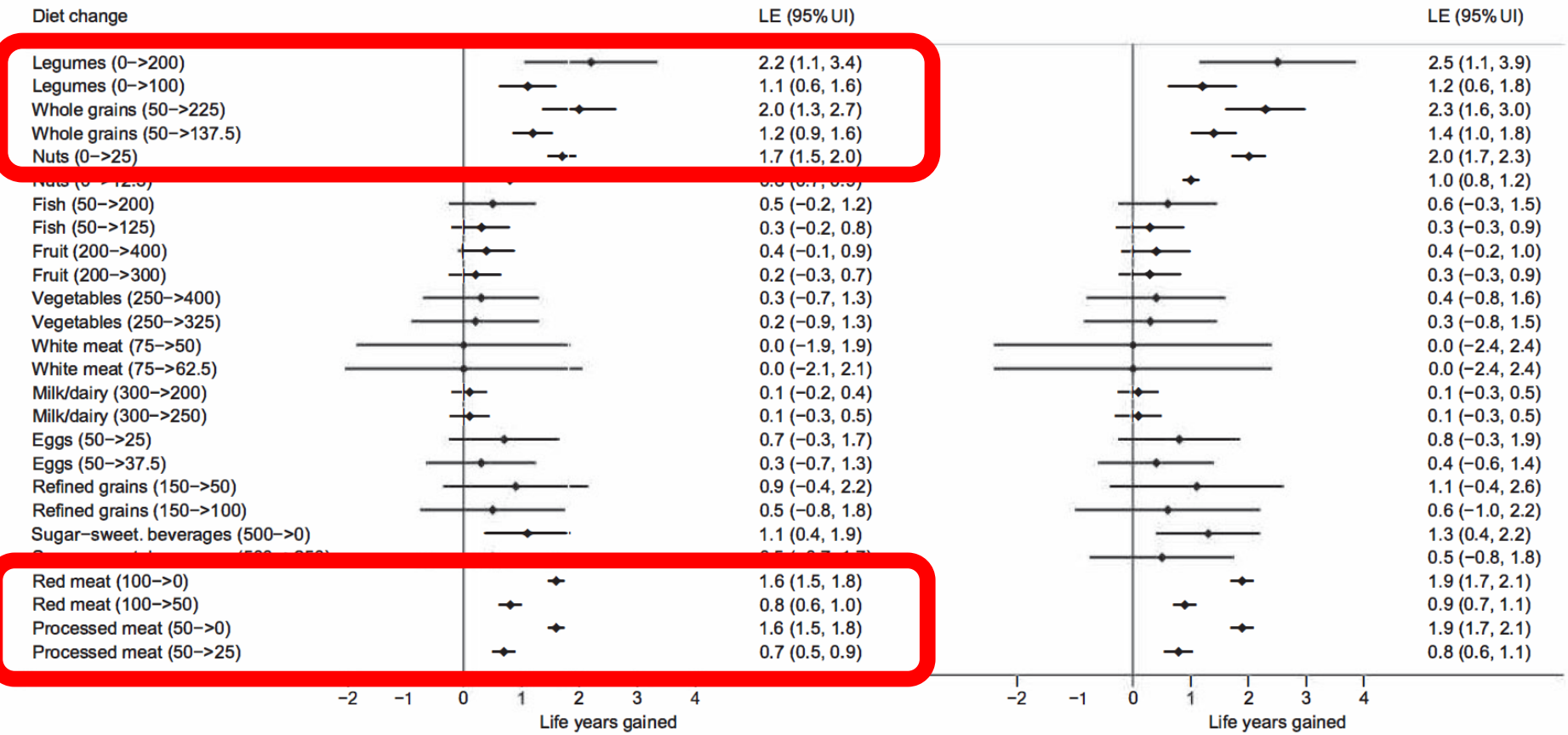
NutriGrade meta-evidence q

Region		Typical Western		Feasibility approach				Optimized			
		Male	Female	Male		Female		Male		Female	
	Age	LE	LE	LE	Gain	LE	Gain	LE	Gain	LE	Gain
United States	20	57.8	62.5	65.1	7.3	68.7	6.2	70.8	13.0	73.3	10.7
	40	39.4	43.3	46.0	6.5	49.0	5.7	51.1	11.7	53.3	10.0
	60	22.4	25.3	27.2	4.8	29.9	4.5	31.2	8.8	33.3	8.0
	80	9.0	10.3	10.9	1.9	12.3	2.0	12.4	3.4	13.7	3.4
[illegible]	[illegible]	[illegible]	[illegible]	63.7	[illegible]	67.7	[illegible]	69.6	[illegible]	72.4	[illegible]
	40	37.6	42.2	44.1	6.4	47.8	5.6	49.7	12.0	52.4	10.2
	60	20.1	23.5	25.0	4.9	28.2	4.7	29.4	9.3	32.1	8.6
	80	7.4	8.6	9.1	1.7	10.5	1.9	10.5	3.1	12.0	3.4
Europe	20	56.3	62.9	63.8	7.6	68.8	5.9	69.9	13.7	73.3	10.4
	40	37.7	43.4	44.5	6.8	49.0	5.5	50.0	12.3	53.2	9.8
	60	21.0	25.1	25.9	4.9	29.6	4.5	30.0	9.1	33.2	8.1
	80	8.4	9.8	10.3	1.8	11.7	2.0	11.7	3.3	13.2	3.5

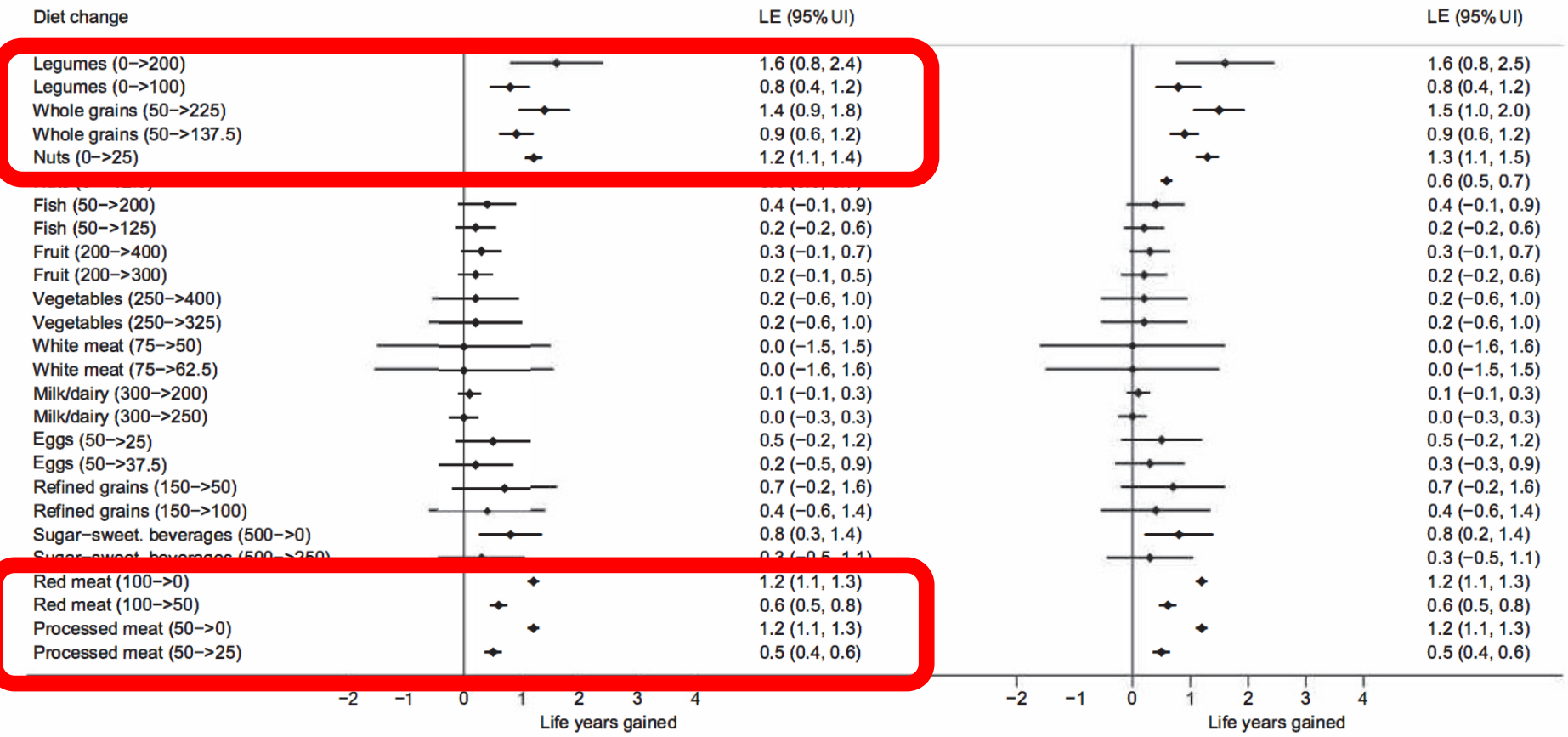
Gevinster av matgrupper



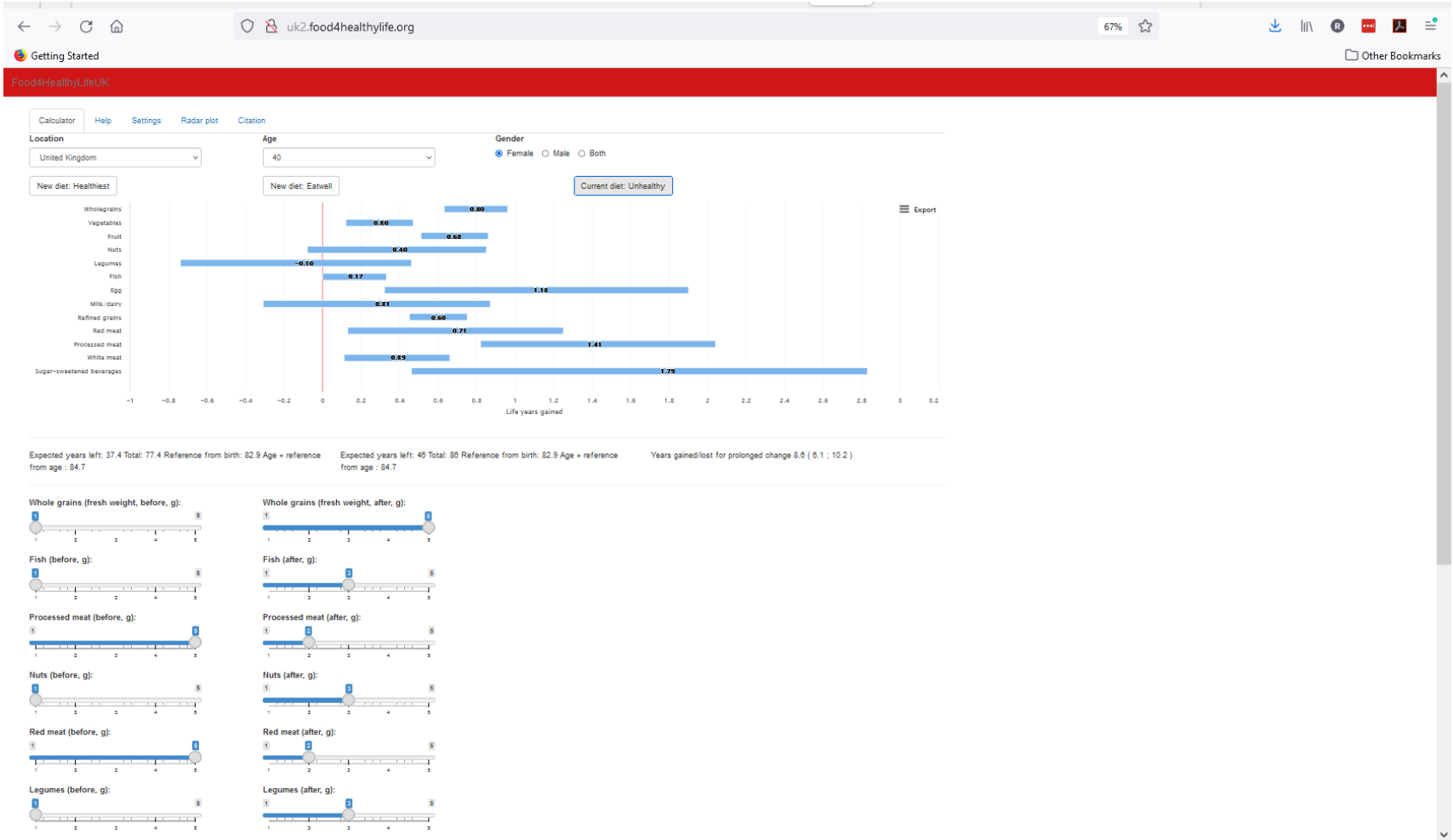
Estimerte leveårsgevinst for 20-år gammel kvinne fra USA med typisk vestlig kosthold til gjennomførbart eller optimalisert kosthold



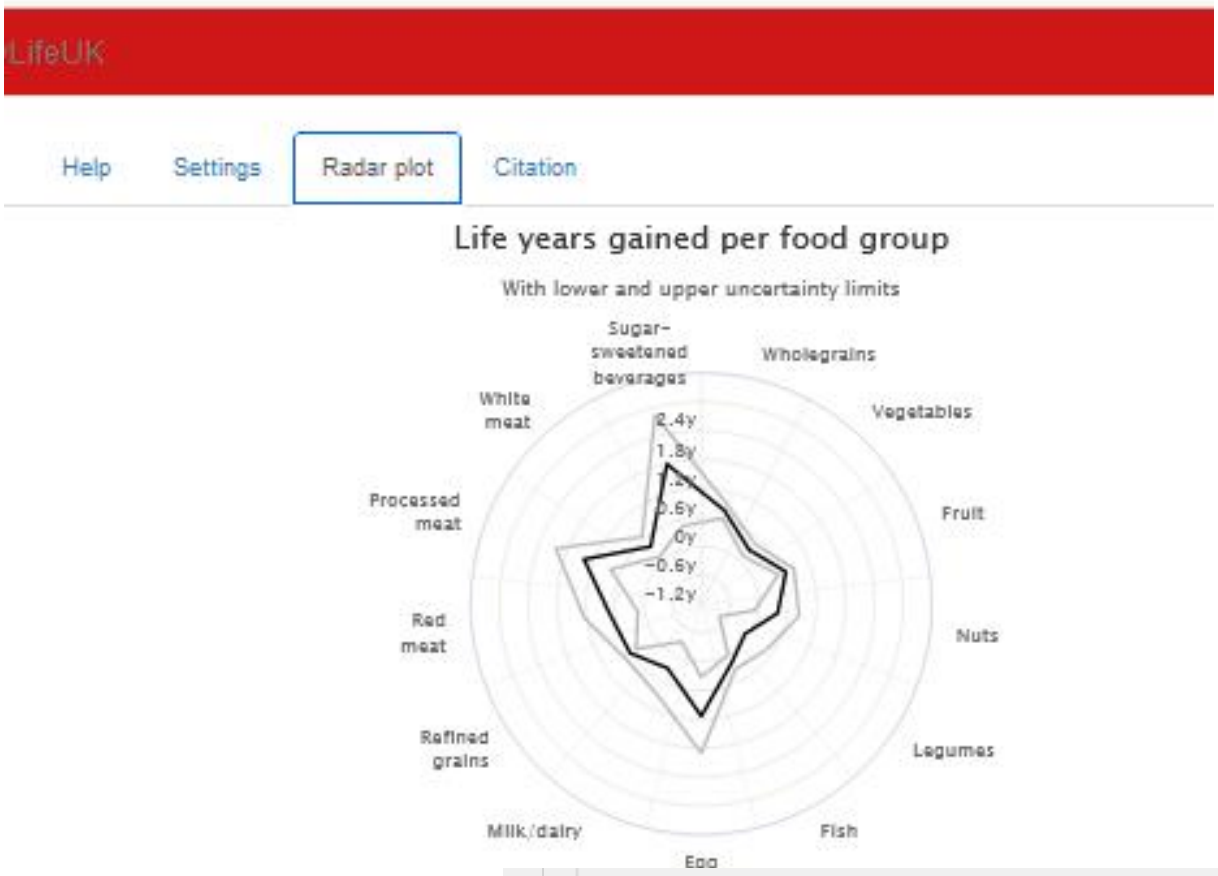
Estimerte leveårsgevinst for 60-år gammel kvinne fra USA med typisk vestlig kosthold til gjennomførbart eller optimalisert kosthold

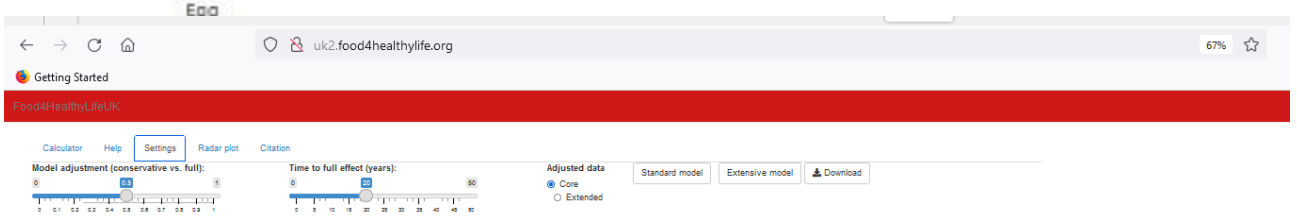


UK tilpasning

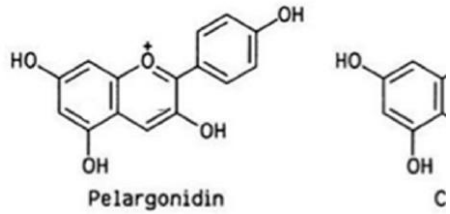


UK tilpasning





Neste steg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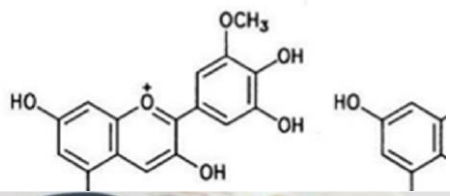
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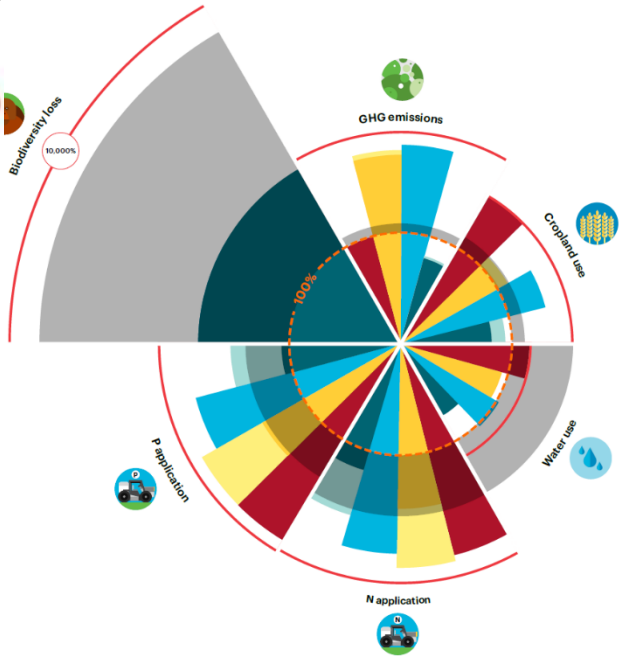
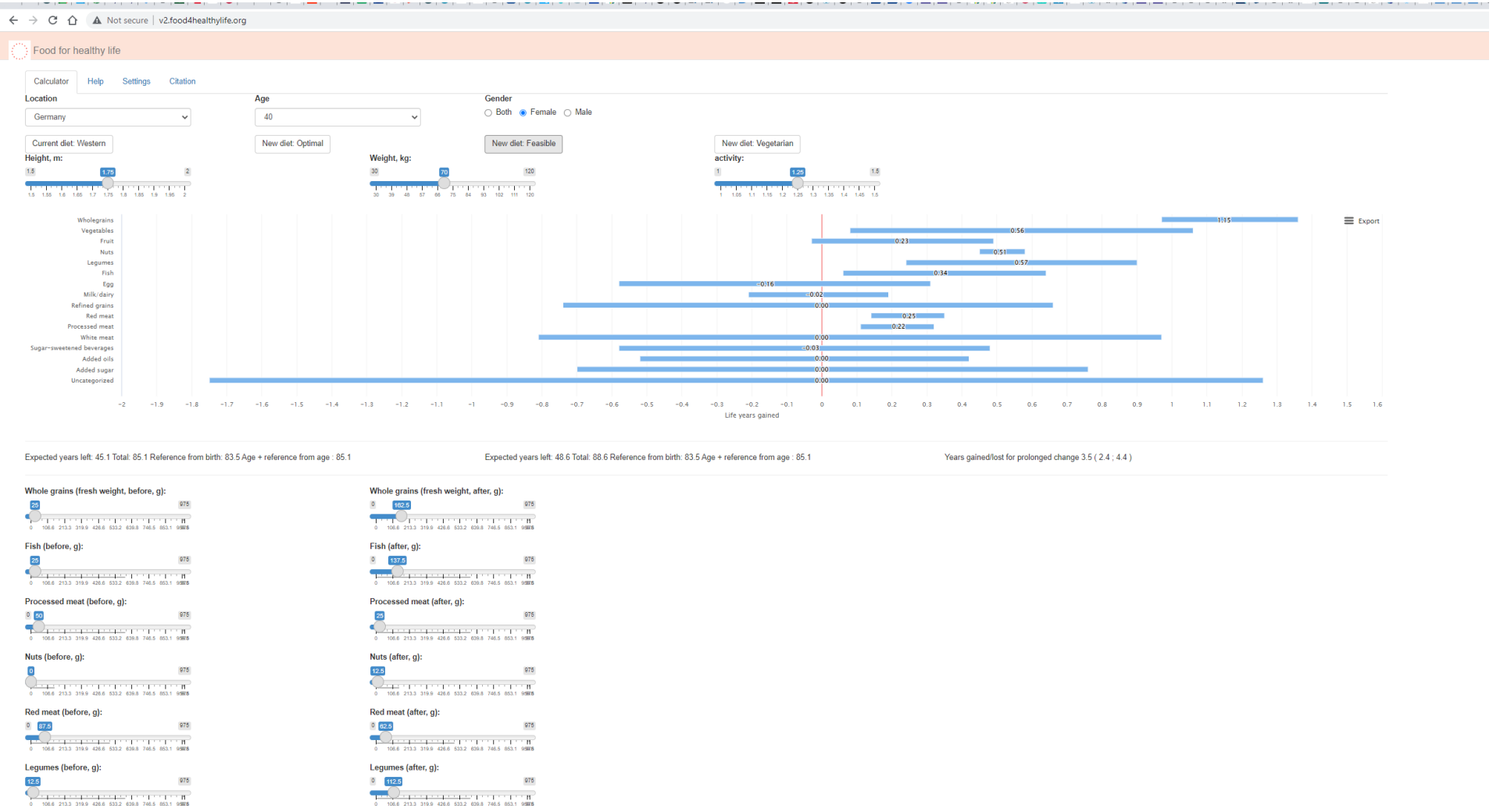

Biodiversity loss
10,000%
GHG emissions
Cropland use
100%
Water use
P application
N application


Contour TS
4.8


2KG
2KG

Food4HealthyLife 2.0



Hva ser kontrollerte studier om ulike metabolske utfall?

- Nøtter, belgvekster, fullkornsprodukter, frukt og grønnsaker kommer best ut også her

Food group relativeranking for each individual primary and secondary outcome and summary ranking across outcomes[1]

	Primary outcomes		Secondary outcomes								Summary ranking
Food group	LDL-C	TG	TC	HDL-C	FG	HbA1c	HOMA-IR	SBP	DBP	CRP	All outcomes combined
Nuts	93	78	92	62	84	37	67	32	42	76	66
Legumes	85	58	91	12	51	61	76	69	70	45	62
Whole grains	70	53	71	44	57	76	86	44	57	61	62
Refined grains	42	25	42	49	74	70	56	14	30	36	44
Fruits and vegetables	63	35	58	49	20	52	43	91	54	26	49
Eggs	40	16	30	58	NA	NA	6	41	41	80	39
Dairy	33	44	33	49	32	NA	21	NA	NA	48	37
Fish	23	97	23	91	NA	NA	47	62	33	32	51
Red meat	20	72	28	57	24	5	NA	48	74	46	42
SSBs	30	23	32	30	28	NA	NA	NA	NA	NA	29

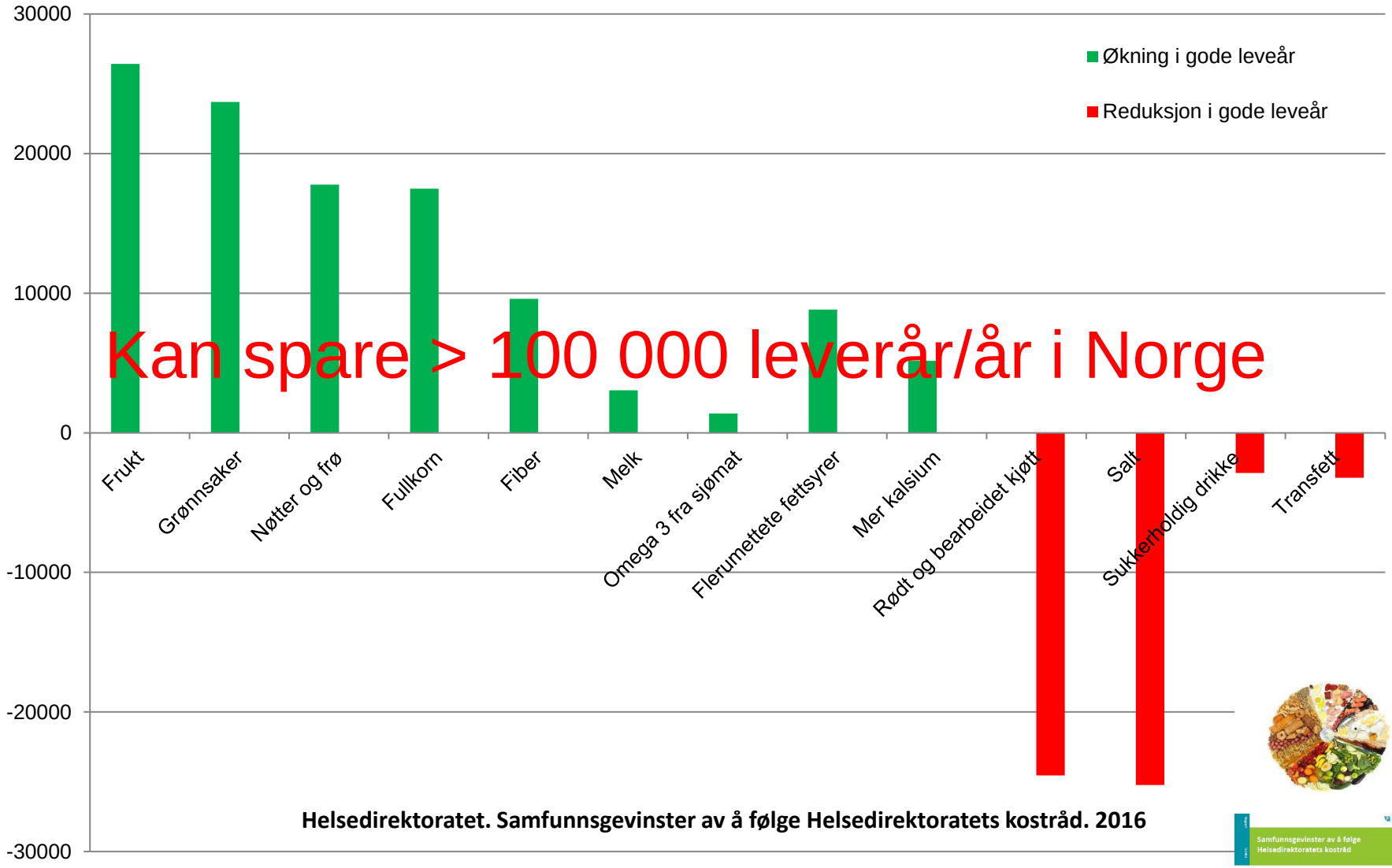
[1]The values represent the SUCRA for all outcomes (e.g, nuts were ranked as the best food group for reducing LDL cholesterol, SUCRA: 93%; fish was ranked as the best food group for reducing triacylglycerol, SUCRA: 97%). CRP, C-reactive protein; DBP, diastolic blood pressure; FG, fasting glucose; HbA1c, glycated hemoglobin; HDL-C, HDL cholesterol; LDL-C, LDL cholesterol NA, not applicable; SBP, systolic blood pressure; SSB, sugar-sweetened beverage; SUCRA, surface under the cumulative ranking curves; TC, total cholesterol; TG, triacyglycerols.

Schwingshackl: **Food groups and intermediate disease markers: a systematic review and network meta-analysis of randomized trials**. *The American journal of clinical nutrition* 2018

Hvordan matcher dette mot de norske kostrådene?

- Råd 1: Det anbefales et kosthold som **hovedsakelig er plantebasert** og som inneholder **mye grønnsaker, frukt, bær, fullkorn og fisk**, og **begrensede mengder rødt kjøtt**, **salt**, tilsatt **sukker** og energirike matvarer.
- Råd 2: Det anbefales at man **opprettholder balanse mellom energiinntak og energiforbruk.**
- Råd 3: Spis **minst 5 porsjoner grønnsaker, frukt og bær** hver dag
- Råd 4: Spis **minst 4 porsjoner fullkornsprodukter** hver dag
- Råd 5: Spis **fisk** tilsvarende **2-3** middagsporsjoner **i uken**
- Råd 6: Det anbefales at magre meieriprodukter inngår i det daglige kostholdet
- Råd 7: Det anbefales at man velger magert kjøtt og magre kjøttprodukter og **begrenser inntaket av rødt kjøtt og bearbeidet kjøtt**
- Råd 8: Det anbefales at man velger matoljer, flytende margarin eller myk margarin
- Råd 9: **Vann** anbefales **som drikke**
- Råd 10: **Begrens** inntaket av **tilsatt sukker**
- Råd 11: **Begrens** inntaket av **salt**
- Råd 12: Kosttilskudd kan være nødvendig for å sikre næringsstoffinntaket for noen grupper i befolkningen.
- Råd 13: Det anbefales at alle daglig er i fysisk aktivitet i minst 30 minutter.»

Endring i gode leveår (Norge)

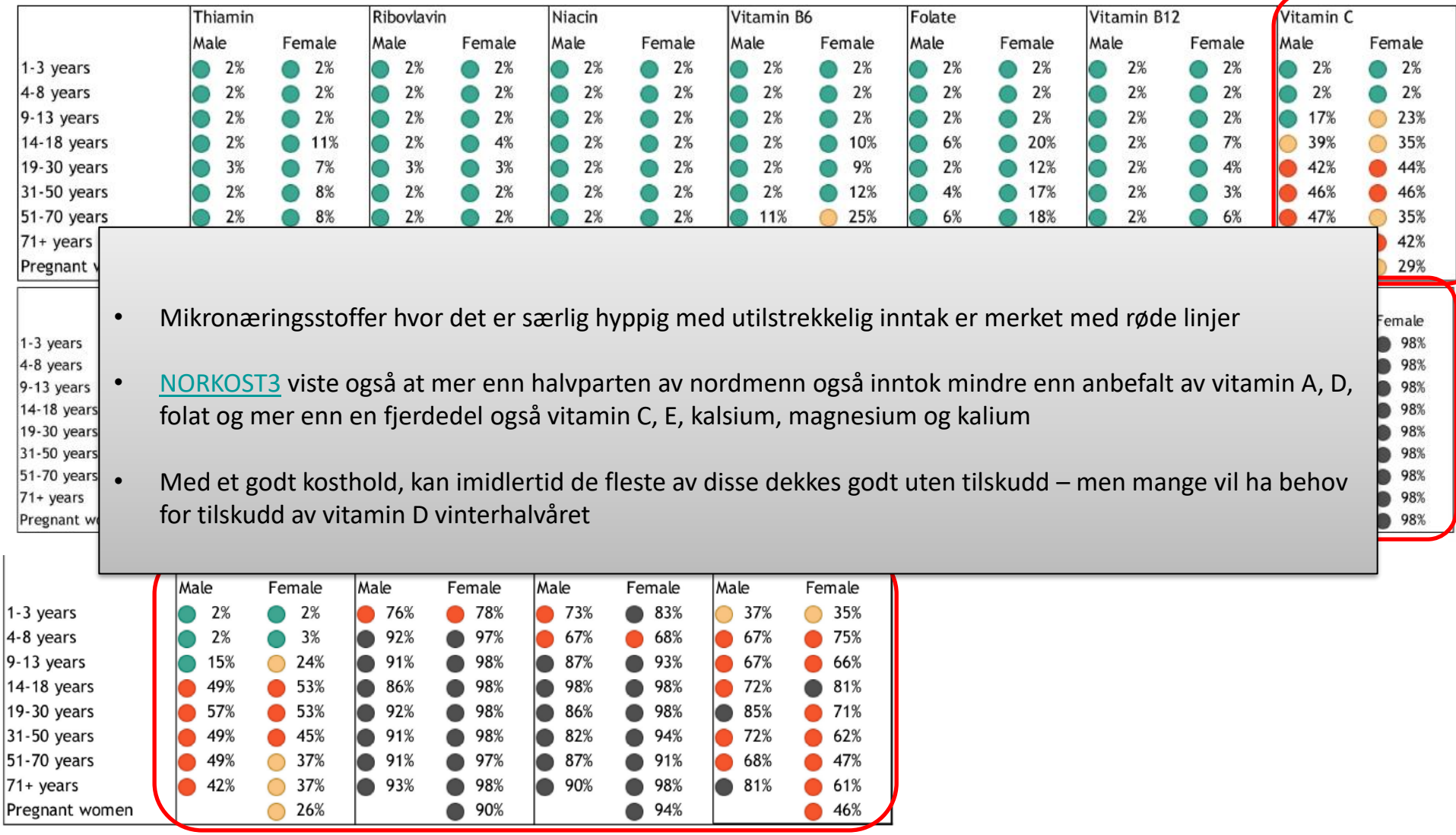


Buettner D, Skemp S: **Blue Zones: Lessons From the World's Longest Lived**. *Am J Lifestyle Med* 2016

Sykdomsforebyggende kosthold «i et nøtteskall»

Mat det er lurt å begrense

Andel med lavt inntak



- Mikronæringsstoffer hvor det er særlig hyppig med utilstrekkelig inntak er merket med røde linjer
- NORKOST3 viste også at mer enn halvparten av nordmenn også inntok mindre enn anbefalt av vitamin A, D, folat og mer enn en fjerdedel også vitamin C, E, kalsium, magnesium og kalium
- Med et godt kosthold, kan imidlertid de fleste av disse dekkes godt uten tilskudd – men mange vil ha behov for tilskudd av vitamin D vinterhalvåret

Proportion of inadequate intakes of minerals, water and fat-soluble vitamins by age, gender and life stage categories based on percentage of the US population with intakes below the Estimated Average Requirement (EAR) (protein) or adequate intake (fiber, 18:3 PUFA). From National Health and Nutrition Examination Survey (NHANES) 2007–2010).

Bruins. *Considerations for Secondary Prevention of Nutritional Deficiencies in High-Risk Groups in High-Income Countries.*

Mat & kosthold har ulike aspekter

- Miljø- og klimaaspekter
- Hensyn for andre arter
- Global matsikkerhet
- Helseaspekter




Konklusjon

- Gunstige kostholdsendringer over tid kan gi store gevinster i form av reduksjon i sykdom og økning i gode leveår for kvinner og menn i ulike alder
- Også gjennomførbare endringer gir stor gevinst
- Største gevinster ser en ved å øke mengden fullkorn, belgvekster, og nøtter samt redusere rødt og bearbeidet kjøtt samt sukret drikke og sukkerrik mat
- Gevinster er større jo tidligere en starter, men store også dersom en starter senere i livet
- Food4HealthyLife (http://food4healthylife.org/) kan hjelpe en i å prioritere hvilke endringer som vil ha stor og mindre stor betydning

Spørsmål og kommentarer