Nordic nutrition recommendations and Vitamin D: evidence base and the impact on public health

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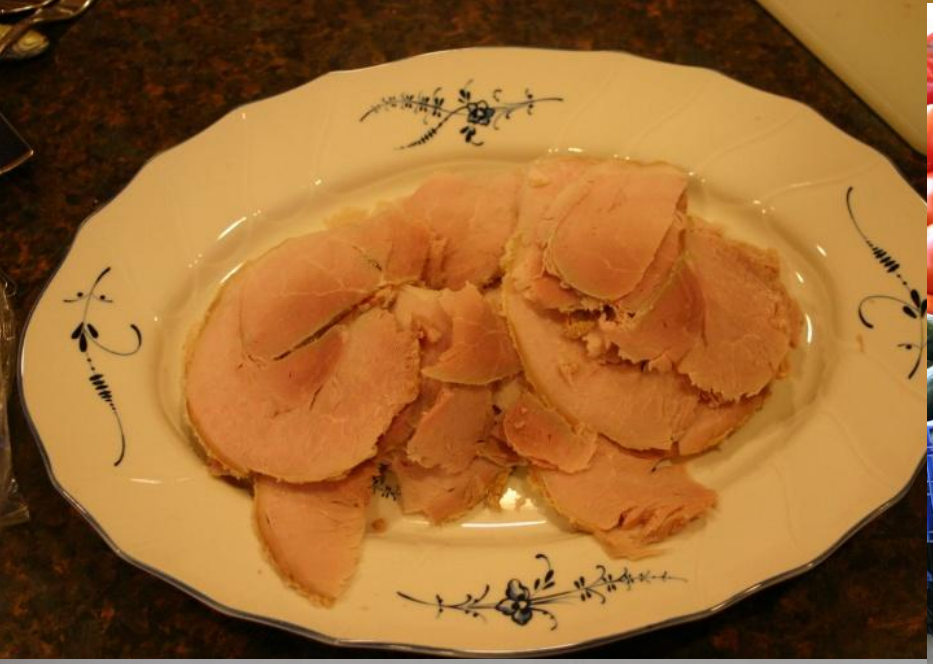
Euroopa Liit
Euroopa Sotsiaalfond

Eesti tuleviku heaks




16/kn

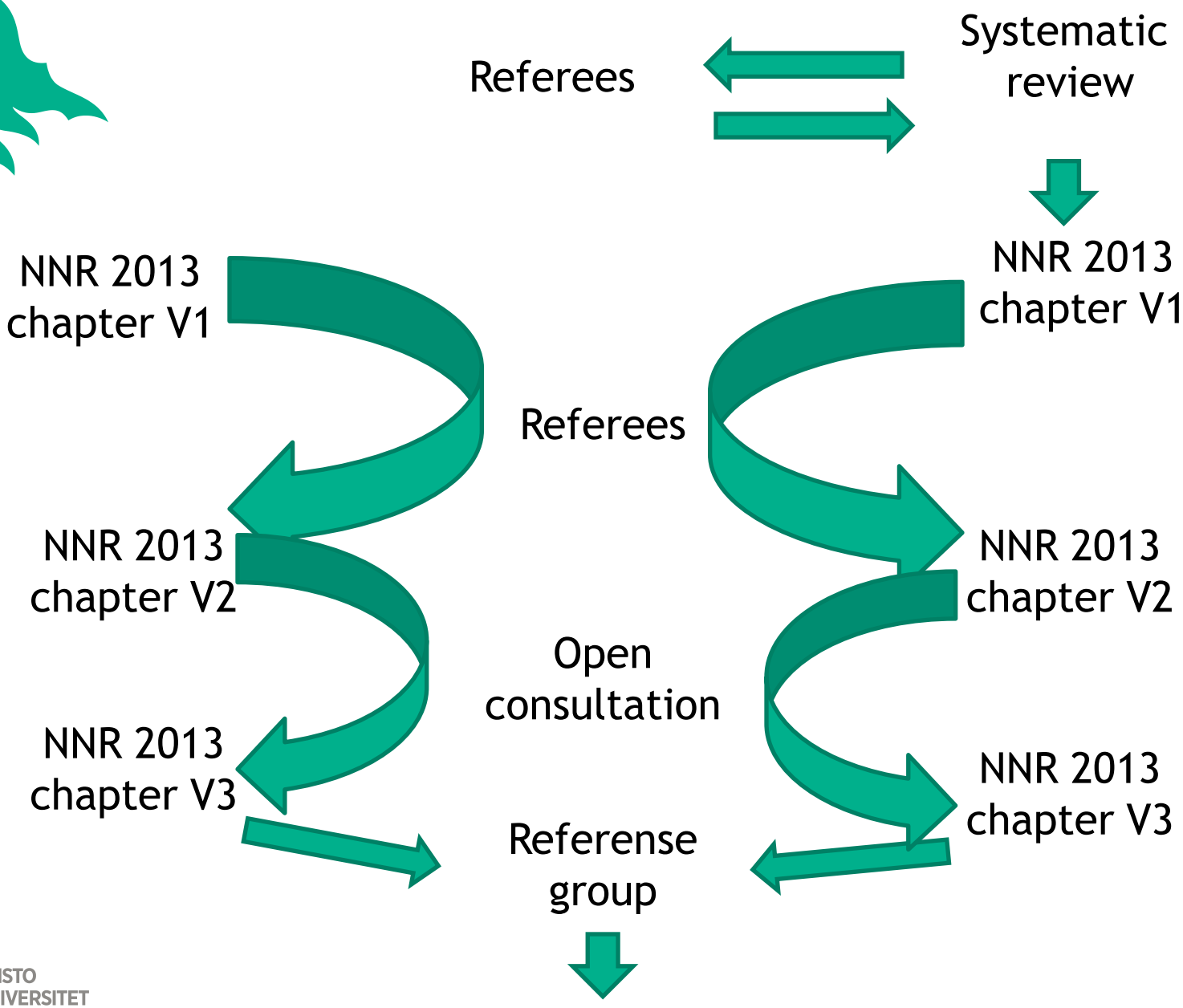
Nutrition recommendations

- For population level, healthy, moderately active people
- To be used with great care for individual dietary counselling
- Long-term recommended intake (weeks or months)
- Upper limit presented for some nutrients
- Quite well applicable for health promotion in e.g. type II diabetes, hypertension and dyslipidaemia
- Not for treatment of diseases or weight reduction
- Not for individuals with changed dietary needs due to a disease

Nordic Nutrition Recommendations (NNR)

- Previous years 1980, 1988, 1996 and 2004
- In English from y. 2004
- Commissioned and financed by the Nordic Council of Ministers
- Organization/roles
  - Project group (2 from each country; from Finland Ursula Schwab and Mikael Fogelholm)
  - Steering group
  - Authors
  - Referees/reviewers

NNR 2012 process



Systematic reviews (SR) on selected nutrients/topics

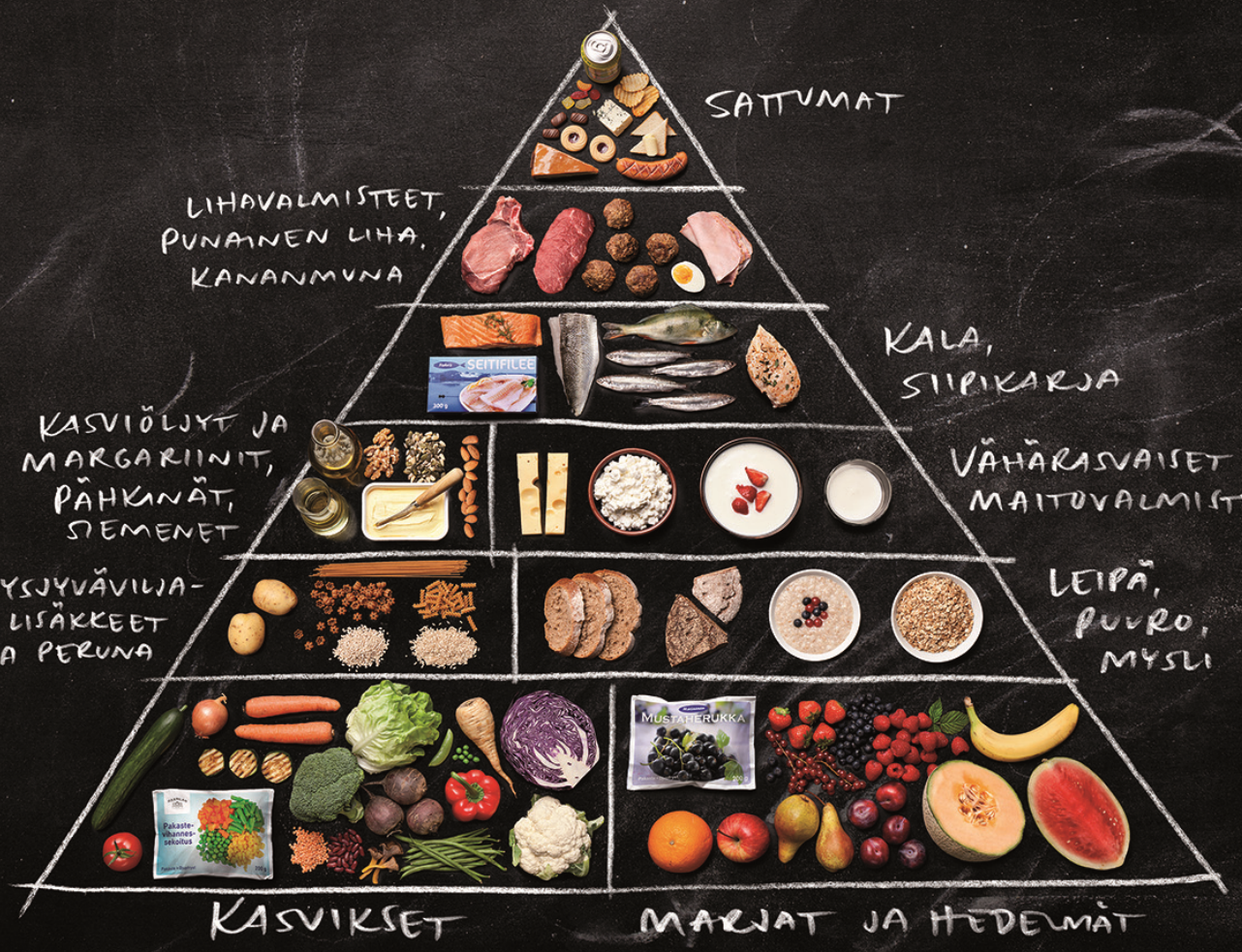
- Type of fat and carbohydrate, protein
- Vitamin D, folate, Ca, Fe, Iodine
- Food groups (milk, meat, wholegrain cereals, potatoes, berries) and dietary patterns
- Breastfeeding
- Specific groups: children, pregnancy/lactation, elderly, population groups in dietary acculturation, overweight/obesity (weight maintenance)
- All reviews are available open access (Food and Nutrition Research)

Food-based dietary guidelines in NNR 2012

Limit	Replace	Increase
Processed meat, read meat	Refined grains → whole-grains	Vegetables, legumes
Foods and drinks with (a lot of) added sugar	Butter, spreads with butter → vegetable oils, spreads with vegetable oils	Fruit, berries
Salt	High-fat dairy → low-fat dairy	Fish, shellfish
Alcohol		Nuts and seeds

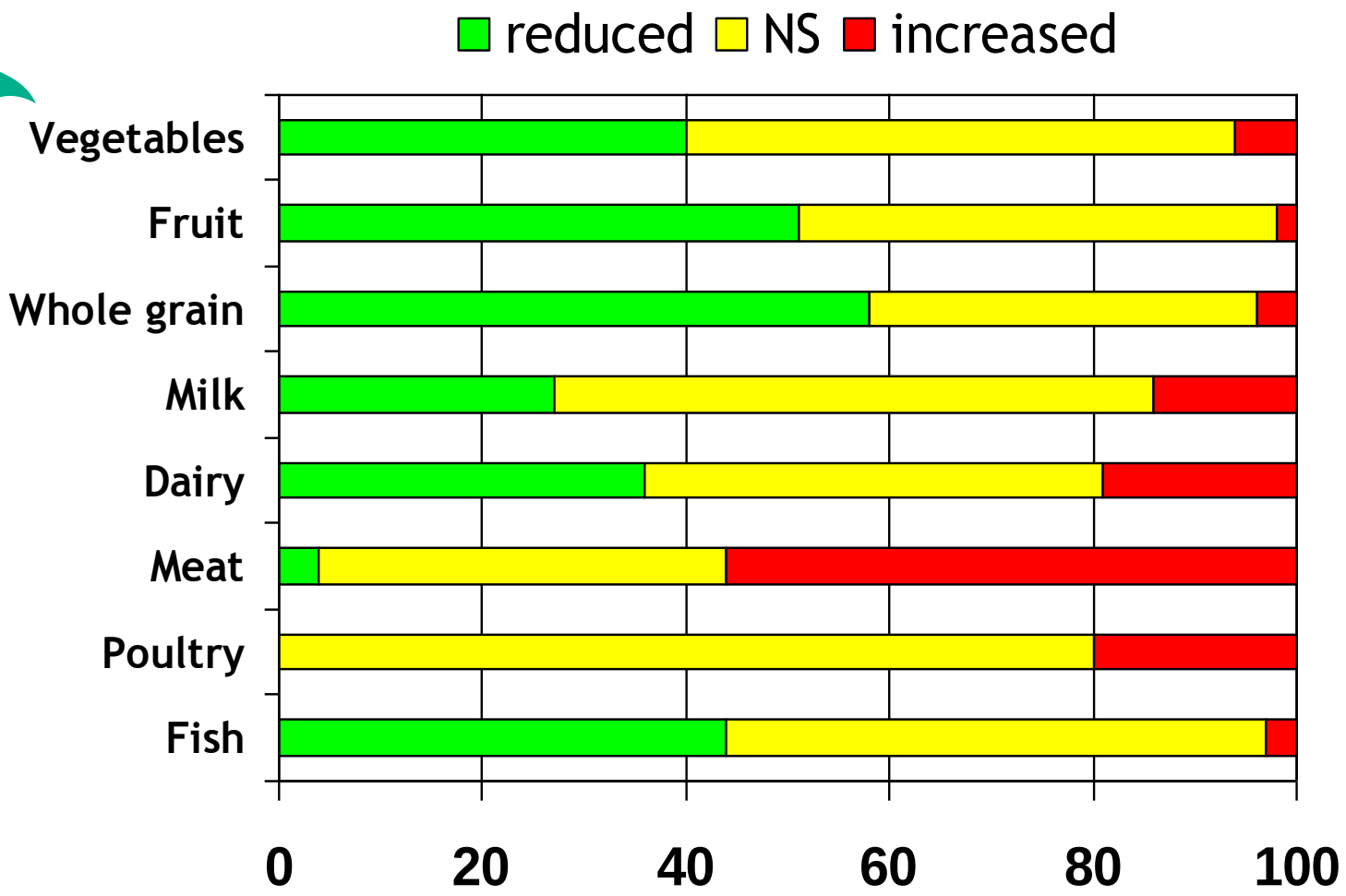
TERVEYTTÄ RUOASTA!

HYVÄN RUOKAVALION AINEKSIA



VALTION RAVITSEMUSNEUVOTTELUKUNTA

Food groups and chronic diseases



A systematic review on the association between food-group consumption and risk for chronic diseases (mainly CVD, T2D, obesity and cancer) in prospective population studies.

Fardet & Boirie. Nutrition Reviews 2014; 72(12):741-762

Macronutrient recommendations in NNR 2012 and dietary intake in Finland

	NNR 2004	NNR 2012	Intake 2012
Total fat, E%	25–35	(25–40)	36
Saturated fat, E%	n. 10	< 10	15
Monounsaturated fat, E%	10-15	10–20	14
Polyunsaturated fat, E%	5-10	5–10	7
Proteins, E%	10-20	10–20	18
Carbohydrates, E%	50-60	(45–60)	45
Sucrose, E%	< 10	< 10	10
Dietary fibre, g	25-35	> 25–35	21

Intake: Findiet 2012, THL

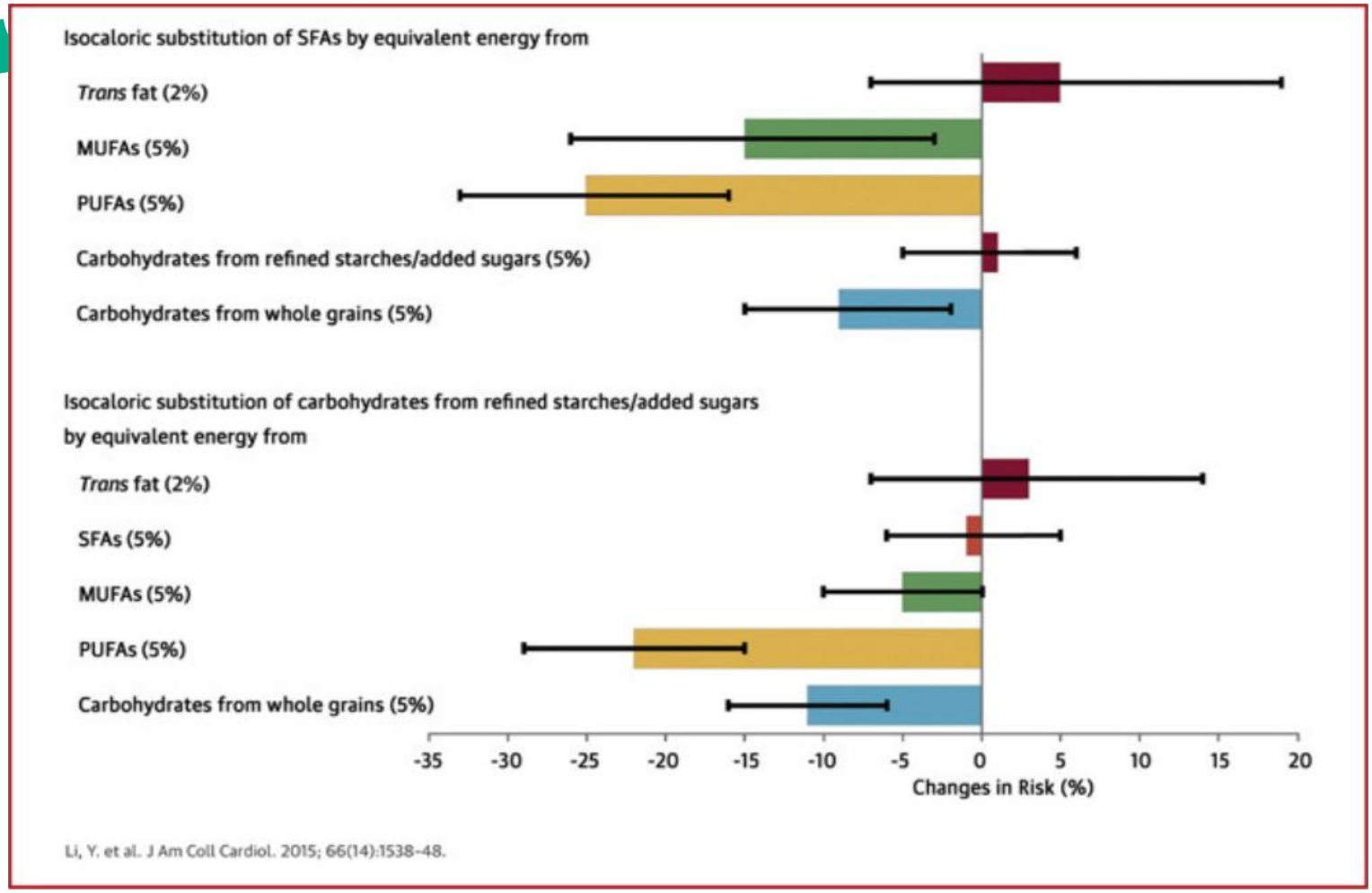

VALIO
VOI
SMÖR
NORMAALISUOLAINEN
NORMALSALTAT
Lisäaineeton
Perinteinen meijerivoi
Traditionellt mejerismör utan tillsatsämnen
500 g


Appelsiinimarmeladi


Becel
Becel
Becel
parempi valinta
bättre val
Omega 3&6

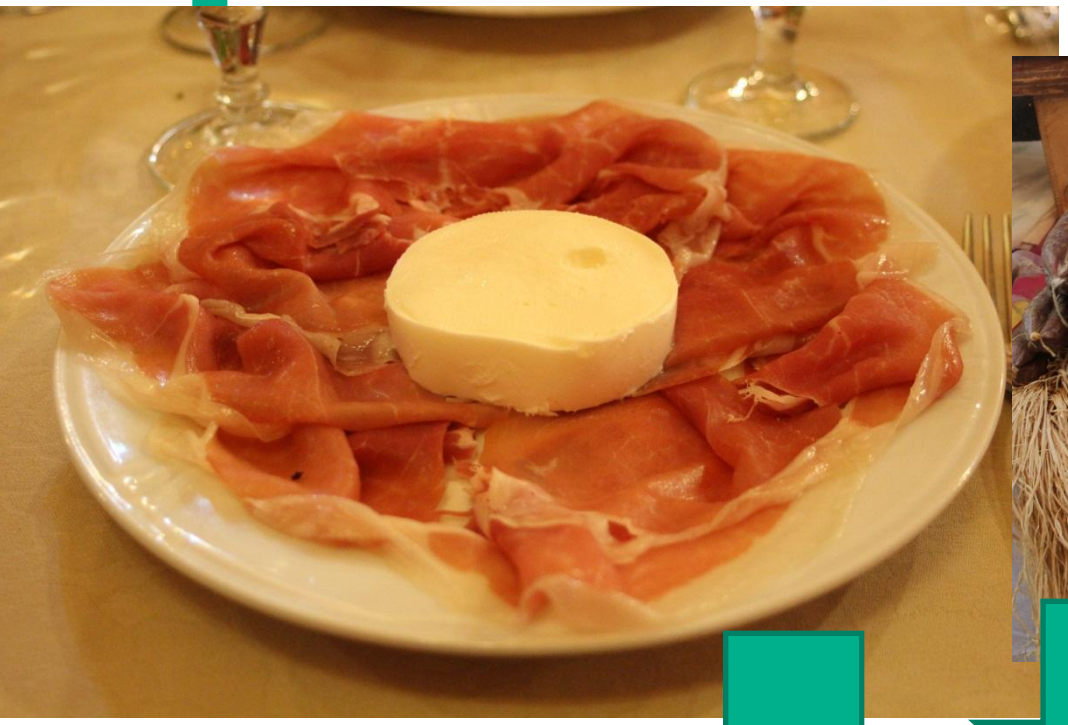
From: Saturated Fats Compared With Unsaturated Fats and Sources of Carbohydrates in Relation to Risk of Coronary Heart Disease: A Prospective Cohort Study

J Am Coll Cardiol. 2015;66(14):1538-1548. doi:10.1016/j.jacc.2015.07.055



Fat, Carbohydrates, and Heart Disease: Estimated Percentage of Changes in the Risk of Coronary Heart Disease Associated With Isocaloric Substitutions of 1 Dietary Component for Another

Changes in risk are derived from hazard ratios and represented as solid bars; I bars represent 95% confidence intervals. The multivariable model was adjusted for total energy intake, the energy contribution from protein, cholesterol intake, alcohol intake, smoking status, body mass index, physical activity, use of vitamins and aspirin, family history of myocardial infarction and diabetes, and presence of baseline hypercholesterolemia and hypertension. MUFA = monounsaturated fatty acid; PUFA = polyunsaturated fatty acid; SFA = saturated fatty acid.




LA FINOCCHIONA
(O meglio SBRICIOLONA)
Salume tipico della parte centrale della Toscana che nei tempi andati sposò il profumo inebriante e ruffiano del finocchio con la carne del maiale. Ancora oggi lo facciamo con i vecchi modi di casa.

Systematic review by Sonestedt et al. Food & Nutrition Research 2012

Does high sugar consumption exacerbate cardiometabolic risk factors and increase the risk of type 2 diabetes and cardiovascular disease?

A Systematic Review for the 5th Nordic Nutrition Recommendations

Emily Sonestedt, Nina Cecilie Øverby, David E Laaksonen, Bryndis Eva Birgisdottir

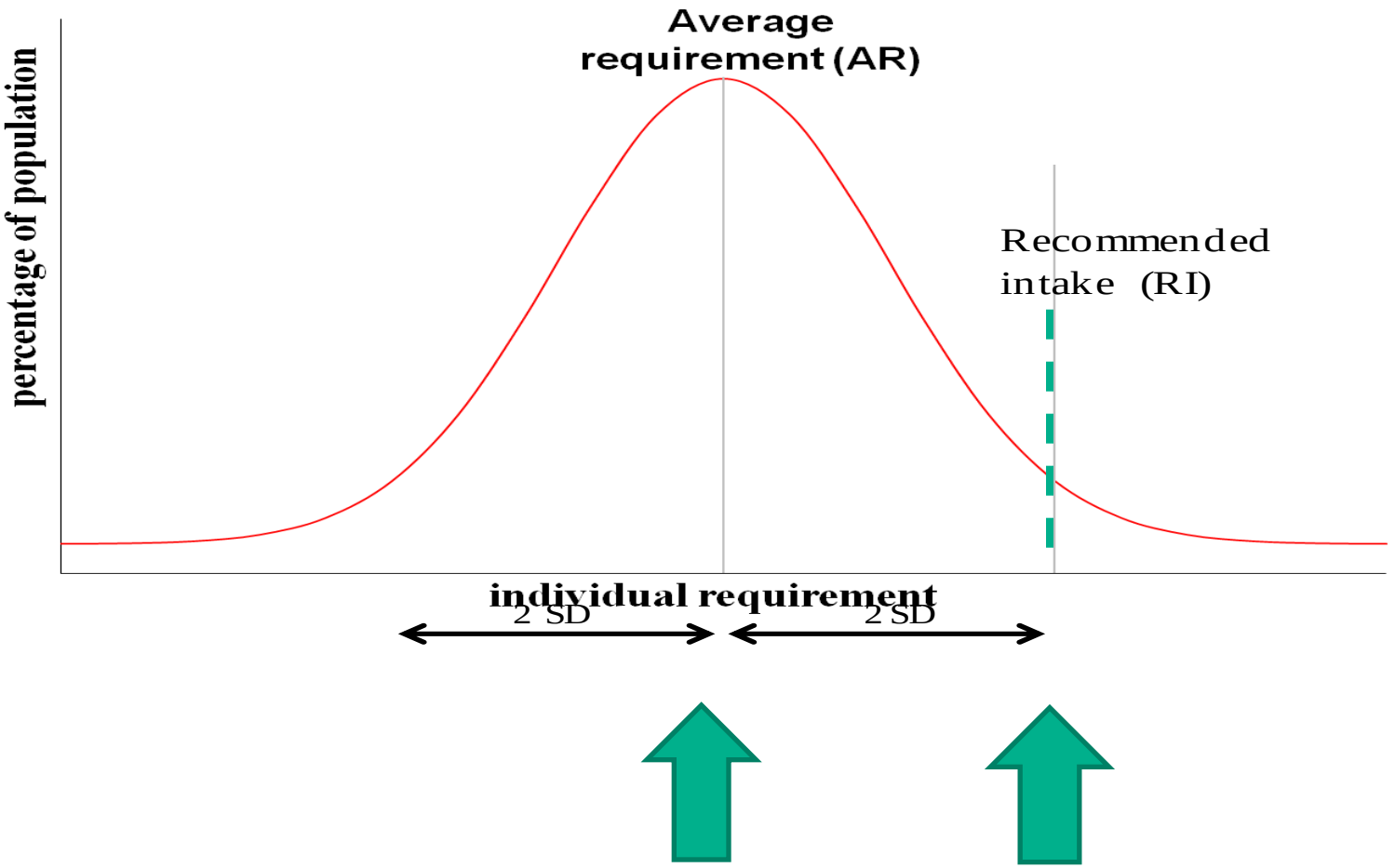
Systematic review by Sonestedt et al. 2012

- 2743 abstracts → 17 studies in the final analyses (15 prospective cohorts, 2 RCTs; adults)
- High consumption of sugar-sweetened beverages is associated with increased risk (incidens) for type 2 diabetes in cohort studies → evidens: probable; 4 out of 6 cohort studies supported the evidece
- No other associations between sugar consumption and disease risk
- Sugar vs. disease risk, all identified studies (regardless of exposure and outcome): 13 x increased risk, 19 x NS, 3 x reduced risk

Setting recommended intake for micronutrients

The requirement is defined as the lowest long-term intake level of a nutrient that will maintain a defined level of nutritional status in an individual. The term average requirement (AR) is used to define the level of a nutrient intake that is sufficient to cover the requirement for half of a defined group of individuals, provided a normal distribution of the requirement .

Average requirement and recommended intake



Recommendations for vitamins in Finland, 2014

	Men	Women
Vit A, µg	900	700
Vit D, µg	10	10
Vit E, mg	10	8
Thiamin, mg	1,4	1,1
Riboflavin, mg	1,7	1,3
Niacin, mg	19	15
Pyridoxine, mg	1,6	1,6
Folate, µg	300	300/400
Vit B12, µg	2	2
Vit C, mg	75	75

Recommendations for certain minerals and trace elements in Finland, 2014

	Men	Women
Salt (NaCl), g	5	5
Potassium, g	3,5	3,1
Phosphorus, mg	600	600
Calcium, mg	800	800
Magnesium, mg	350	280
Iron, mg	9	15/9
Selenium, µg	60	50

Vitamin D

UV-light

Diet

Supplements

D-vitamin in serum
(Serum 25-OHD)

Health outcomes
e.g. bone health,
muscle function

Vitamin D - a systematic literature review for the 5th edition of the Nordic Nutrition Recommendations

Christel Lamberg-Allardt[1]*, Magritt Brustad[2],
Haakon E. Meyer[3,4] and Laufey Steingrimsdottir[5]

[1]Department of Food and Environmental Sciences, University of Helsinki, Helsinki, Finland; [2]UIT-The Arctic University of Norway, Tromsø, Norway; [3]Department of Community Medicine, Institute of Health and Society, University of Oslo, Oslo, Norway; [4]Norwegian Institute of Public Health, Oslo, Norway; [5]Unit for Nutrition Research, Landspitali University Hospital & University of Iceland, Reykjavik, Iceland

Food and Nutrition Research 2013

The electronic databases MEDLINE and Swemed were searched.

Eight questions which were used for the search. The search terms related to vitamin D status and intake and different health outcomes as well as to the effect of different vitamin D sources on vitamin D status. Serum or plasma 25(OH)D-concentration was used as an indictor of exposure.

First search: systematic literature reviews (SLRs).
Second search: SLRs and randomized control trials (RCTs) published after March 2009. Furthermore, snowballing was used for SLRs and RCTs published between February 2011 and May 2012.

Outcome: 1,706 studies in the two searches of which 28 studies were included in the review. In addition, 7 more by snowballing, thus 35 papers were included in total. Of these studies, 31 were SLRs and 4 were RCTs.

The following outcome measures were included:

- Pregnancy outcomes and growth, bone health (all fractures, hip fractures, vertebral fractures, bone mineral density/osteoporosis, bone mass, bone quality, rickets, osteomalacia, dental health)
- muscle strength, falls
- all cancers, breast cancer, colorectal cancer, prostate cancer
- diabetes type I
- diabetes type II
- multiple sclerosis
- obesity
- hypertension/blood pressure
- cardiovascular disease (CVD) clinical outcomes
- infections
- total mortality

What is the relationship between 25-OHD concentrations/ dietary vitamin D intake/supplemental vitamin D and different outcomes in different population and age groups?

We found some evidence for a causal relationship with bone health, falls and muscle strength, and total mortality.

We did not find evidence for establishing a causal relationship between vitamin D intake, vitamin D supplementation, or serum 25-OHD concentration and most other the health outcomes.

Most intervention studies report that intervention with vitamin D combined with calcium and not vitamin D alone gives these benefits.

Reid IR, Bolland MJ, Grey A. Effects of vitamin D supplements on bone mineral density: a systematic review and meta-analysis. Lancet. 2014 Jan 11;383(9912):146-55.

We searched for trials assessing the effects of vitamin D (D3 or D2, but not vitamin D metabolites) on bone mineral density.

Of 3930 citations identified by the search strategy, 23 studies (mean duration 23·5 months, comprising 4082 participants, 92% women, average age 59 years) met the inclusion criteria. Mean baseline serum 25-hydroxyvitamin D concentration was less than 50 nmol/L in eight studies (n=1791).

In ten studies (n=2294), individuals were given vitamin D doses less than 20 µg/d. Bone mineral density was measured at one to five sites (lumbar spine, femoral neck, total hip, trochanter, total body, or forearm) in each study, so 70 tests of statistical significance were done across the studies. There were six findings of significant benefit, two of significant detriment, and the rest were non-significant.

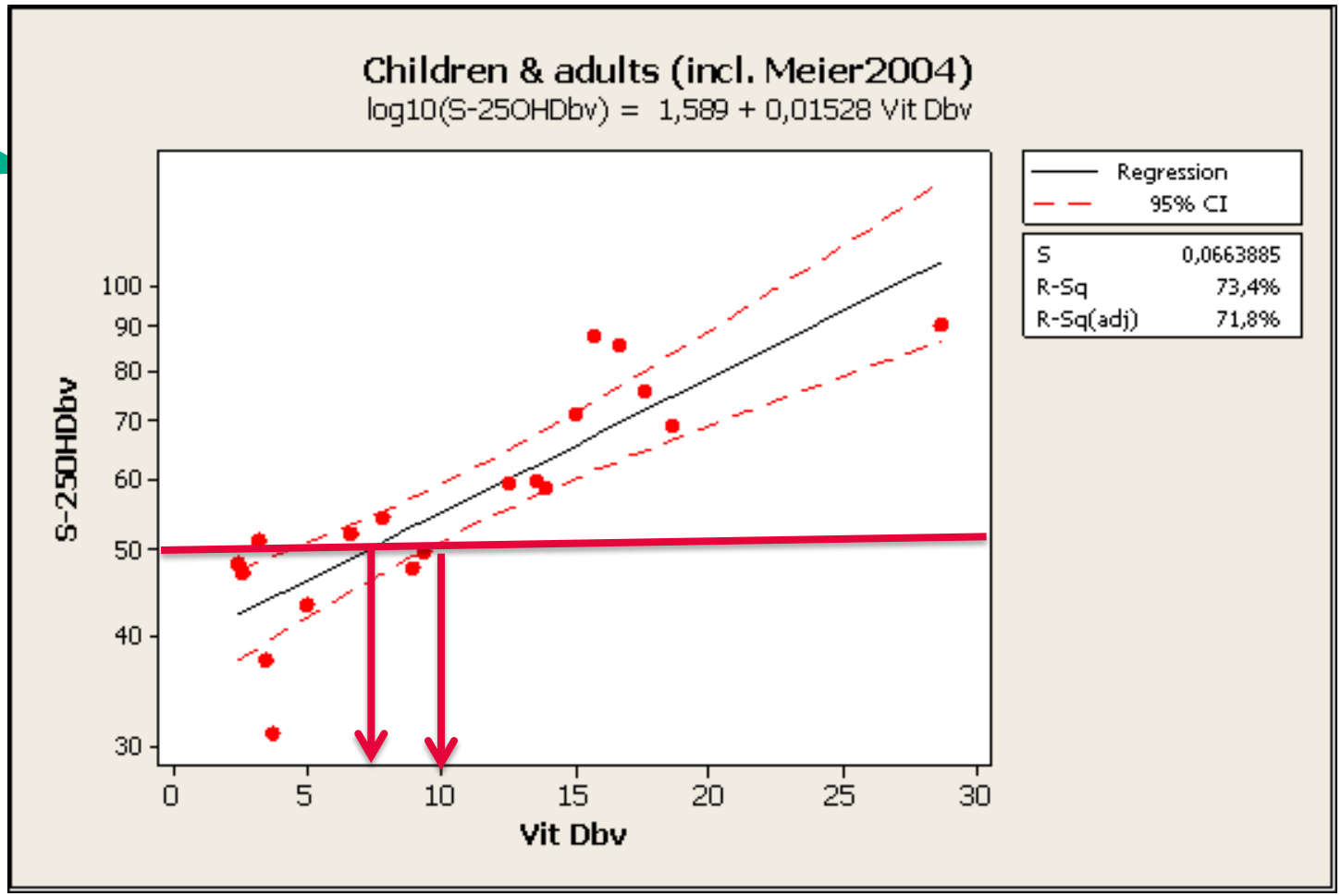
What is the relationship between 25-OHD concentrations/ dietary vitamin D intake/supplemental vitamin D and different outcomes in different population and age groups?

Many studies suggest that there is an increased risk for rickets in infants and children when S-25(OHD) concentration is <27.5 nmol/l.

A threshold for 25(OH)D at 40—50 nmol/l has been suggested in the SLRs for the prevention of falls and fractures in the elderly.

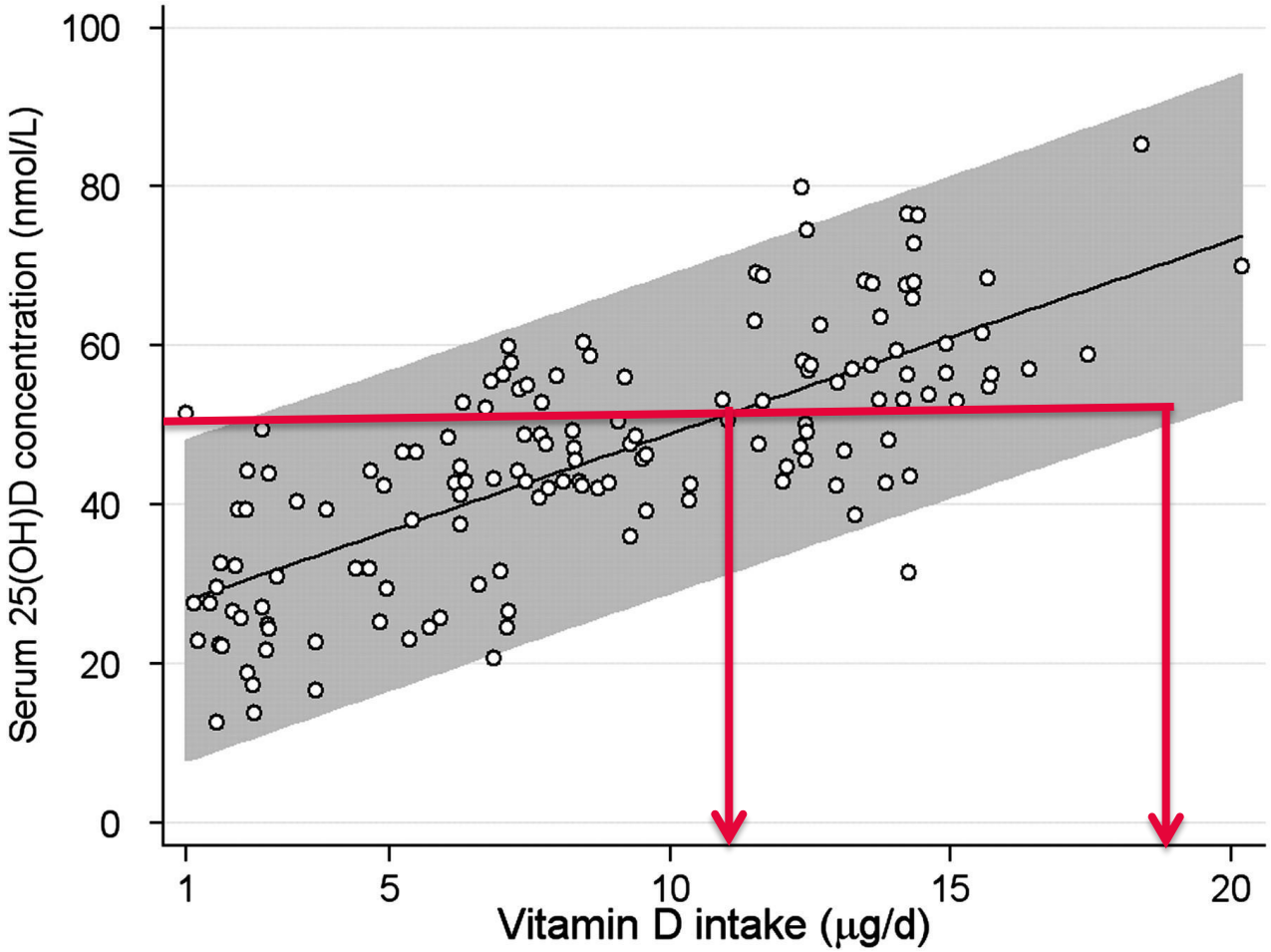
Solid evidence for an optimal S-25(OH)D concentration (or optimal intake) in children, adolescents and adults was not found in the SLRs relating to the health outcomes.

However, a S-25(OH)D concentration of 50 nmol/l could be a reasonable threshold in these age groups also.



VitD, µg/d	S-25OHD
7,2	50,0
10	55,2
15	65,8

Relation between serum 25-hydroxyvitamin D [25(OH)D] concentrations in late winter and total vitamin D intake (diet and supplemental) in healthy girls with a mean age of 11.3 y (n = 144) living at northerly latitudes (55° and 60°N).



Cashman K D et al. Am J Clin Nutr 2011;93:549-555

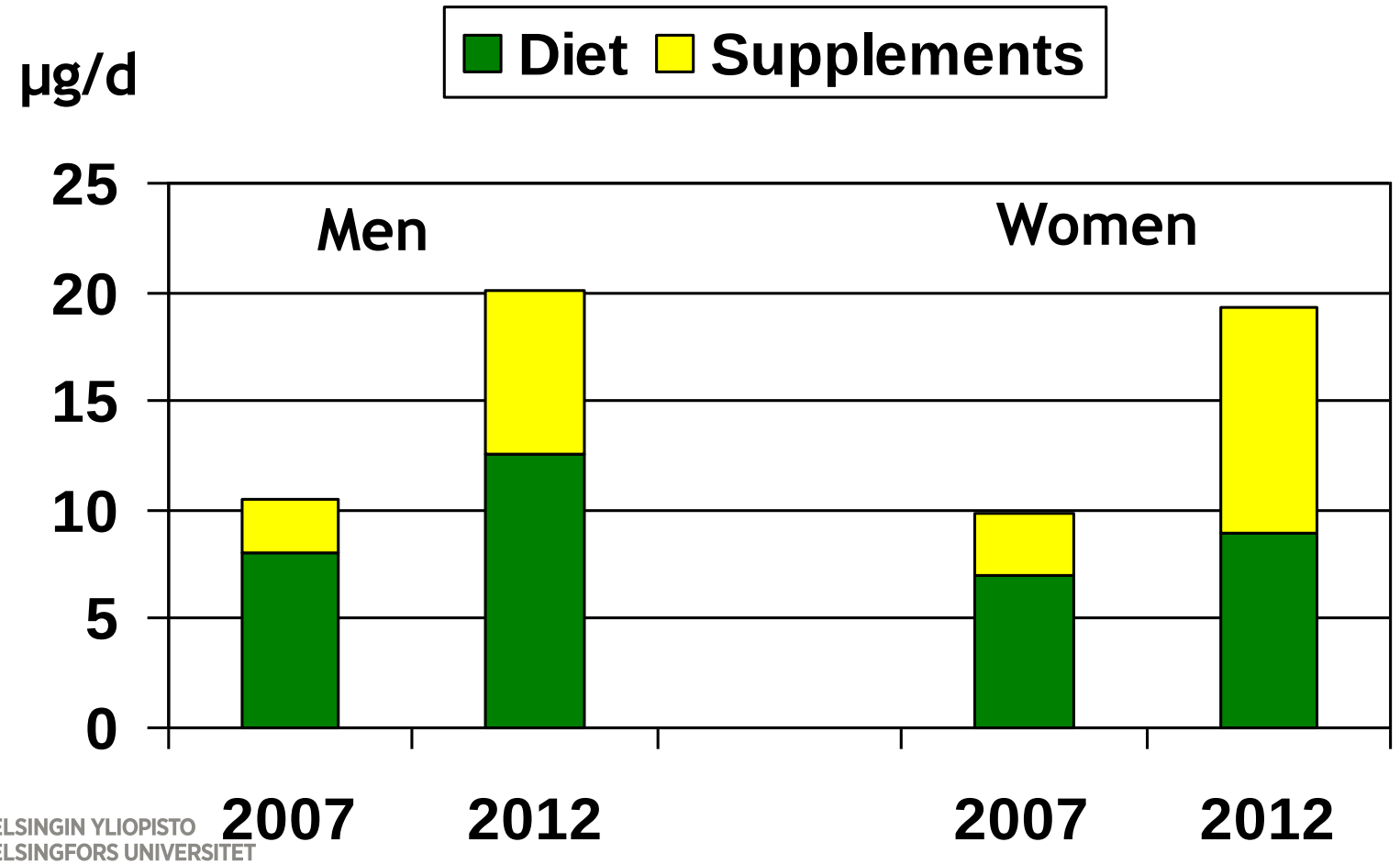
New recommendations for vitamin D (µg/d)

Recommended intake	RI	
2-60 y.		10
61-74 y.		10
≥ 75 y.		20
Average requirement		7.5
Lower intake level LI		2.5
Upper intake level UL		100

Finnish recommendation for vitamin D intake and supplementation (National Nutrition Council, 2014)

Age-group	Recommended dietary intake	Supplementation (in addition to dietary intake)
2 wk - 2 y	10 µg/d	10 µg/d (daily)
2 - 17 y	10 µg/d	7,5 µg/d (daily)
18 - 60 y	10 µg/d	10 µg/d (if needed)
61 - 74 y	10 µg/d	10 µg/d (if needed)
≥ 75 y	20 µg/d	20 µg/d (daily)
Pregnant, lactating	10 µg/d	10 µg/d (daily)

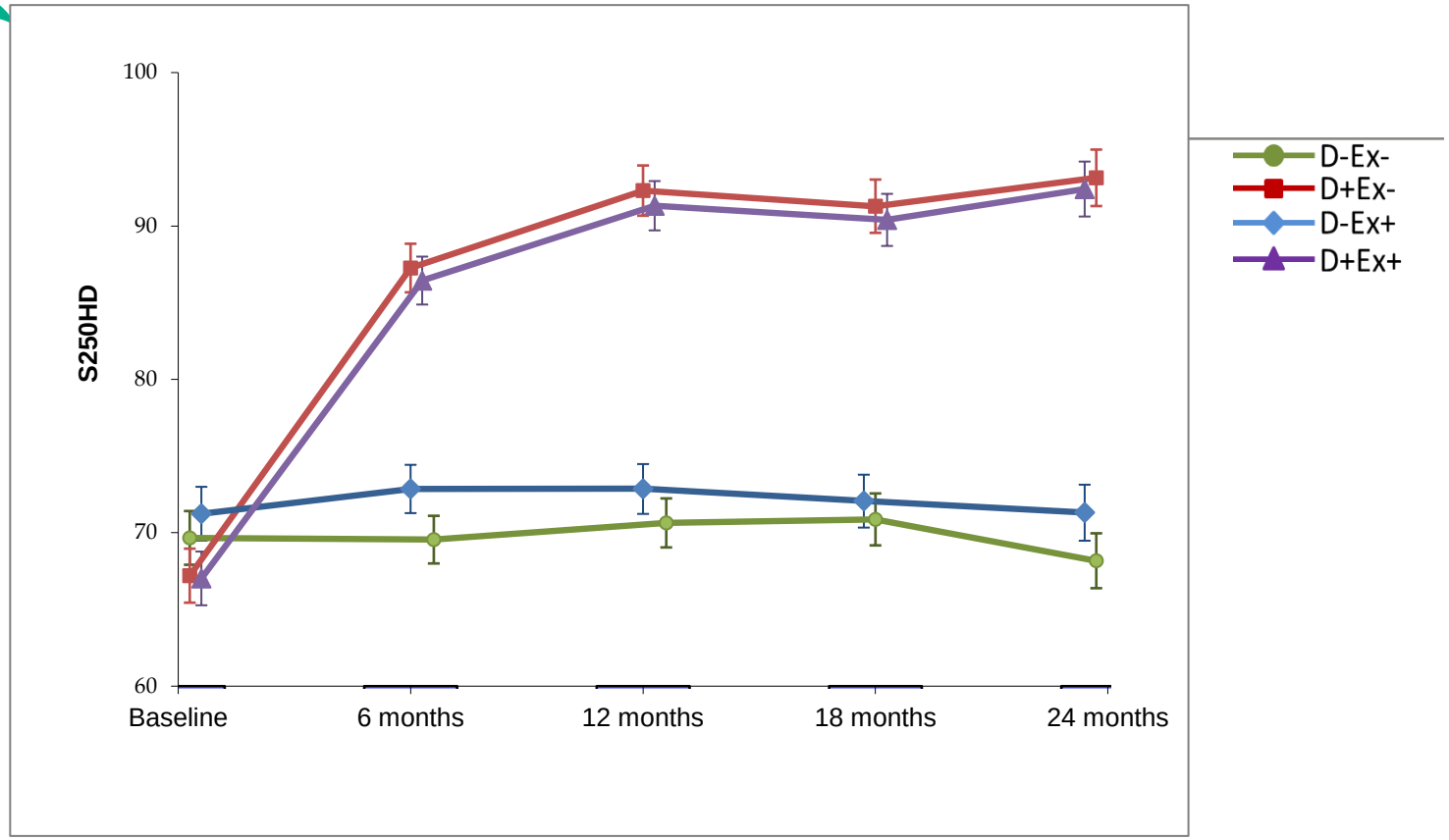
Intake of vit D in Finland 2007 and 2012 (µg/d)



60% of intake:

THL: Findiet 2012

Exercise and vitamin D (20 µg/d) in fall prevention among older women: a randomized clinical trial.



Mean changes (95 % CI) in S-25(OH)D-concentrations in 409 home-dwelling women 70 to 80 years old

Uusi-Rasi et al. JAMA Intern Med 2015;175:703-11.


Uncle Ben's
Risottoriisi
Risottoris
Uncle Ben's
"Onnistuu aina"
Risottoriisi
Risottoris
15 MIN.
Korkealaatuinen Toppivalinta
500 g
1 lit
9 dl
8 dl
7 dl
6 dl
5 dl
4 dl
3 dl
2 dl
1 dl
GRAM
600
500
400
300
200
100
800
700
600
500
400
300
900
800
700
600
500
400


Cono Sur
Adolfo Hurtado, Winemaker
Riesling
GRANAROLO
Grana Padano