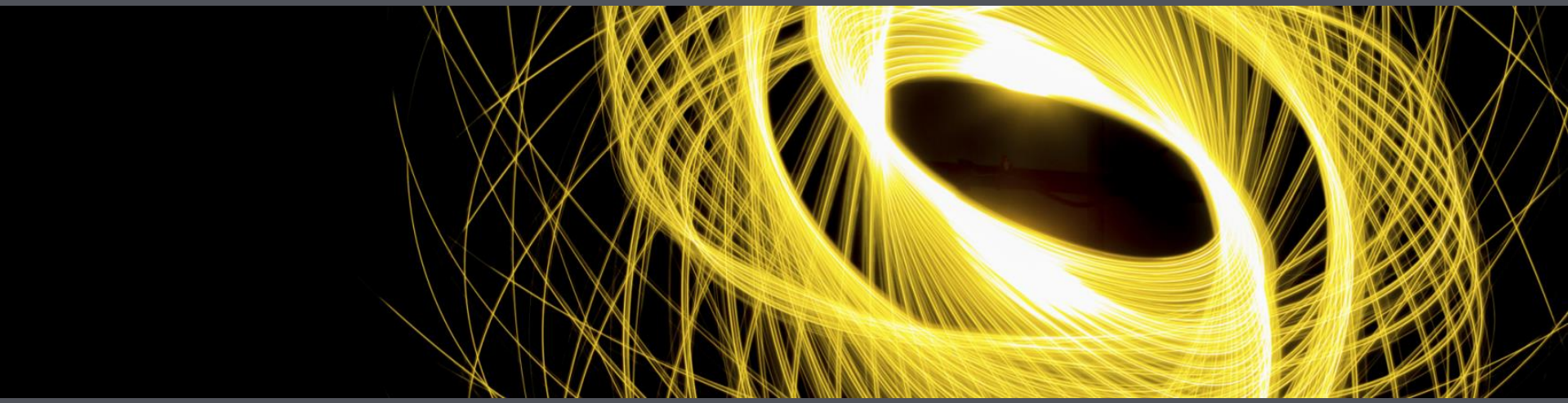
INSTITUTE FOR FOOD, NUTRITION AND HEALTH

University of Reading | 1926 2016
NINETY YEARS OF EXCELLENCE

THE ROLE OF MILK PRODUCTS IN HUMAN HEALTH



Ian Givens

Professor of Food Chain Nutrition

University of Reading

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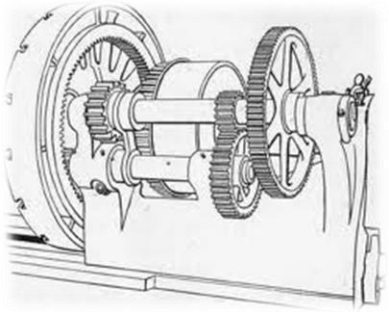
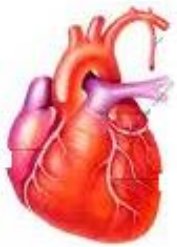
Dairy products and health: what are we trying to do?



Mechanisms?



PROBLEMS IN THE YOUNG

Dairy food intake in UK females

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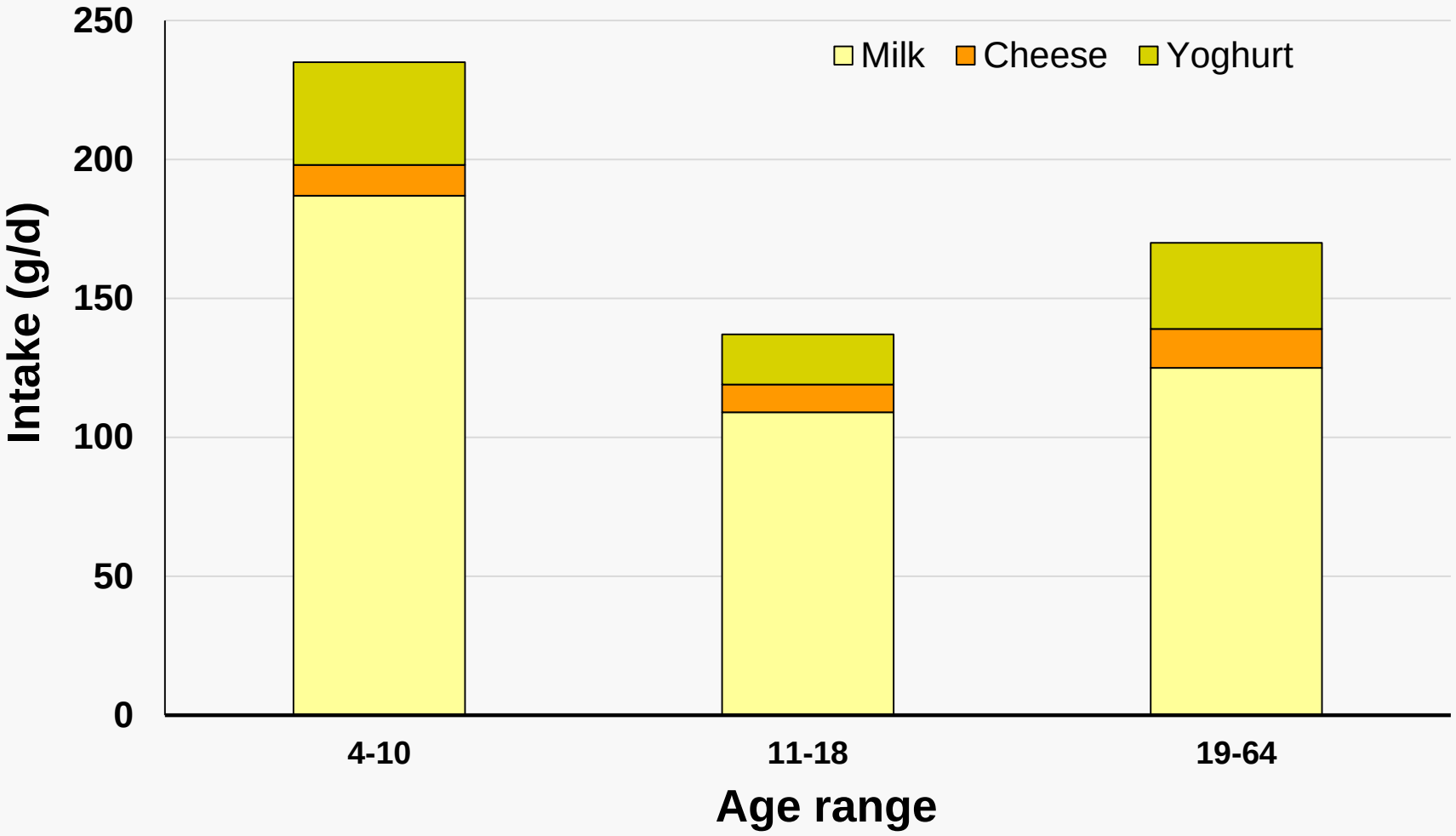
NDNS 2014, Y1-4 combined



Micronutrient status of UK children and adult females

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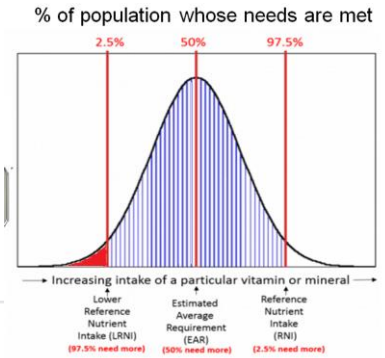

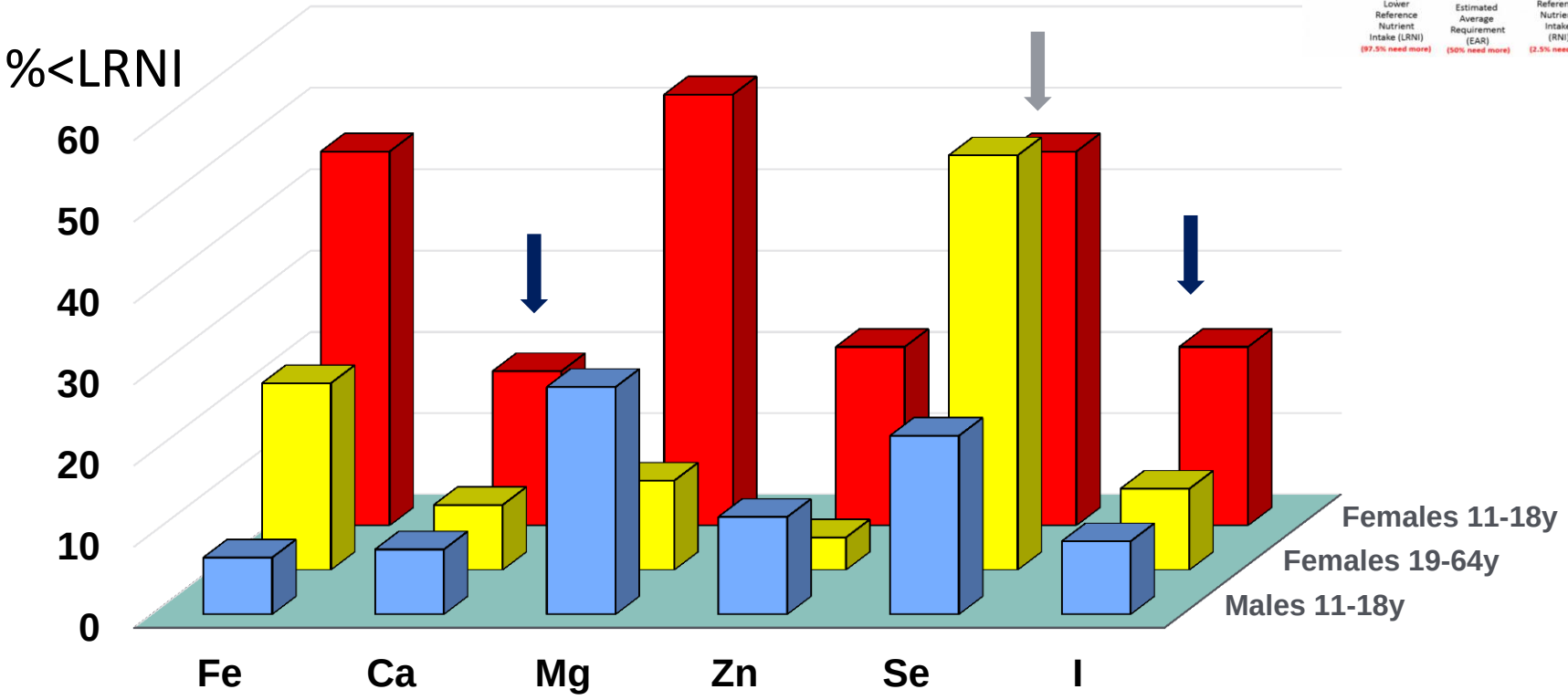

Bone mass changes with age

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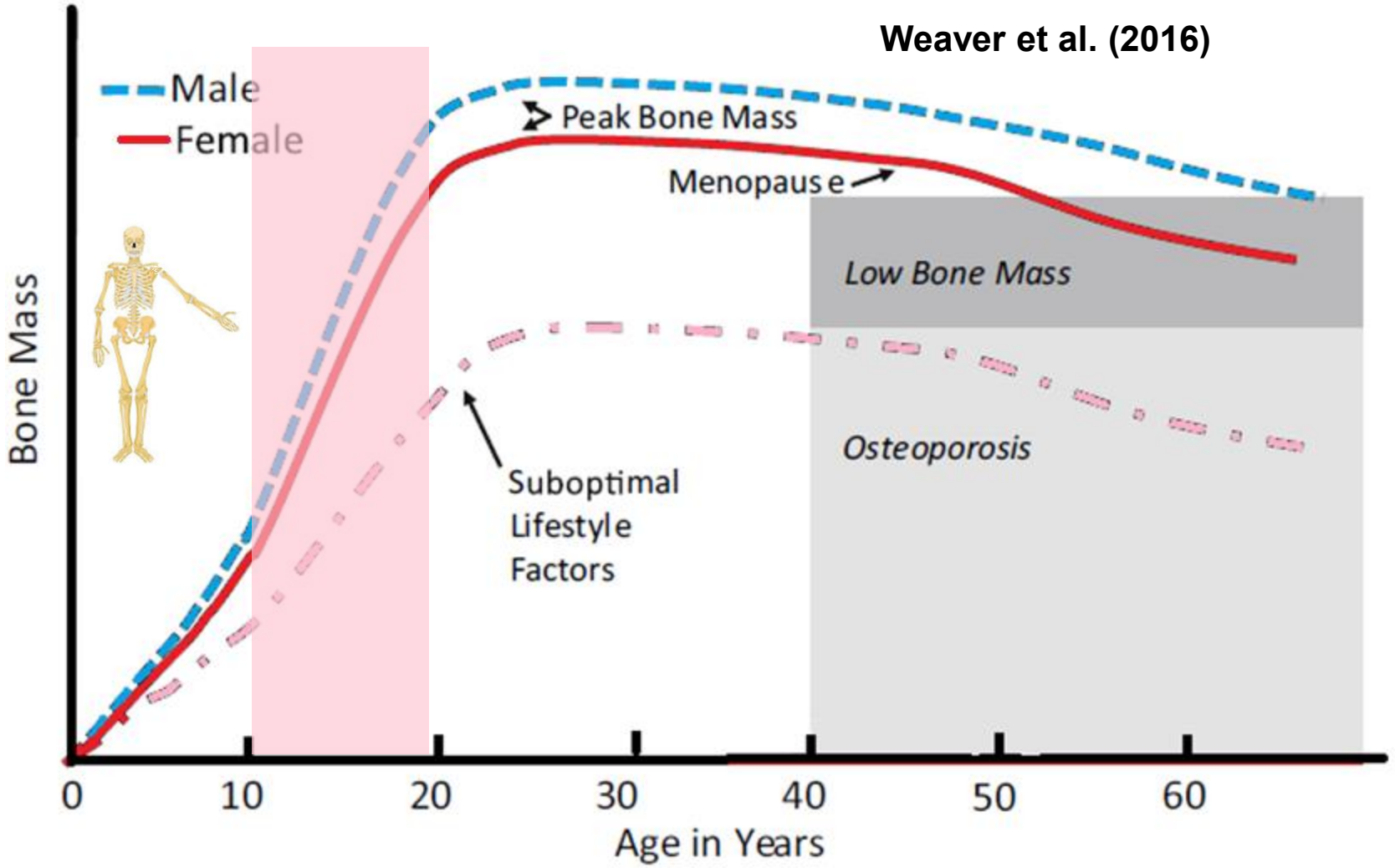
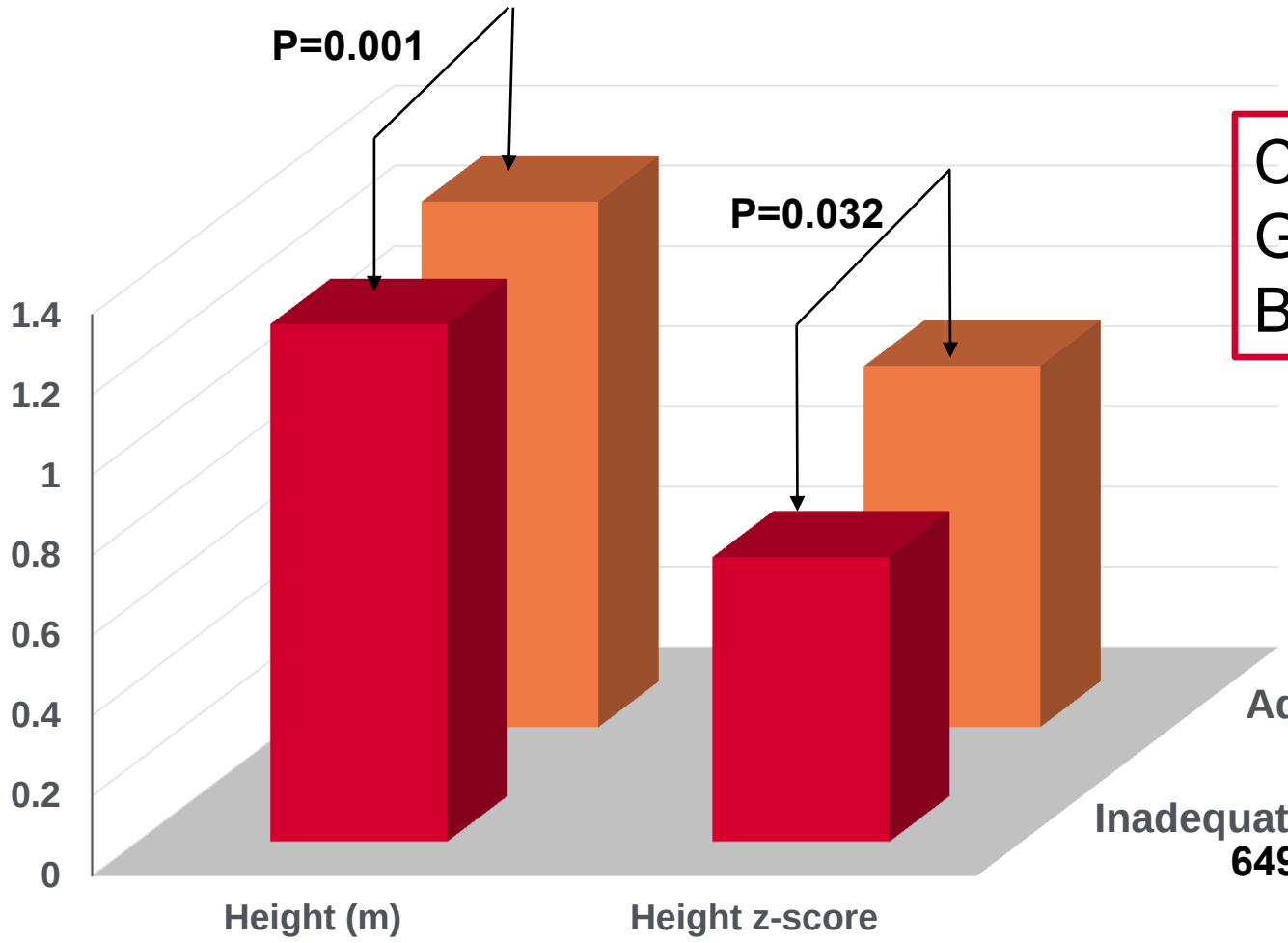


Calcium status of Spanish children at ~7 years old

Rubio-López et al., 2017



Ca inadequate
Girls 29%
Boys 22%

Childhood milk intake and fracture risk in females >=50 years

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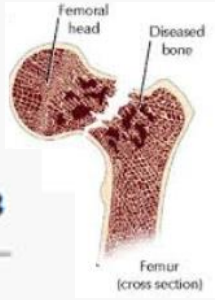

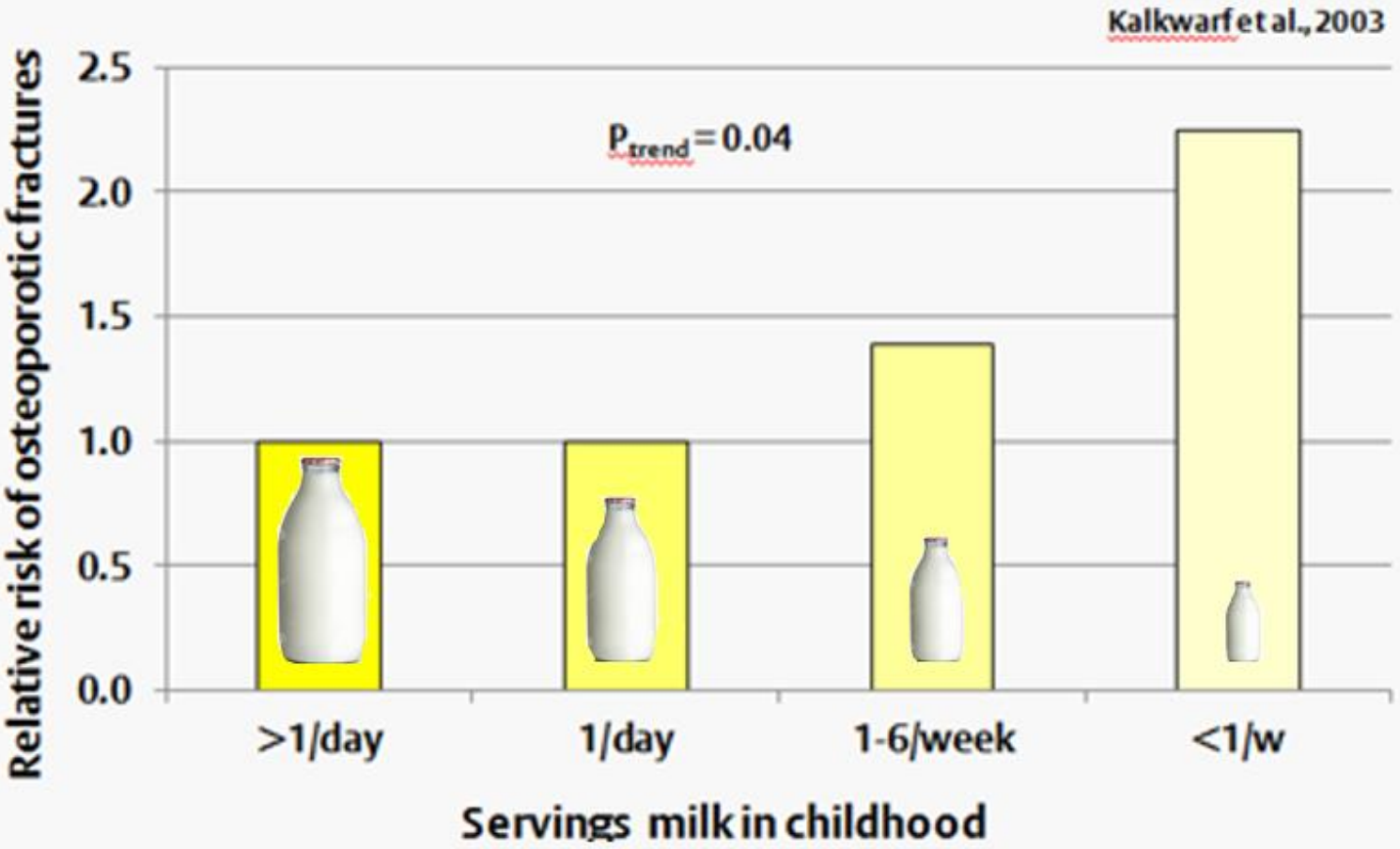

Bonetrophic nutrient interactions

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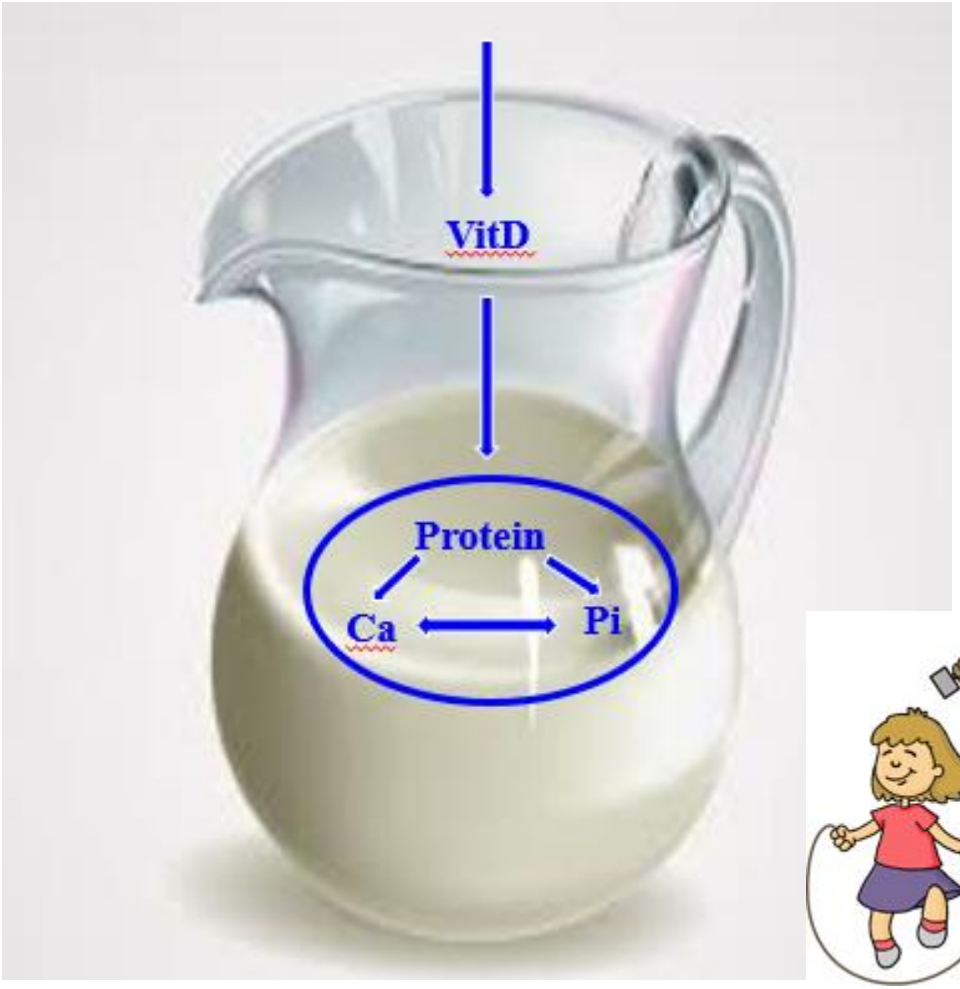

Protein for bones?

Sub-optimal vitamin D status across Europe

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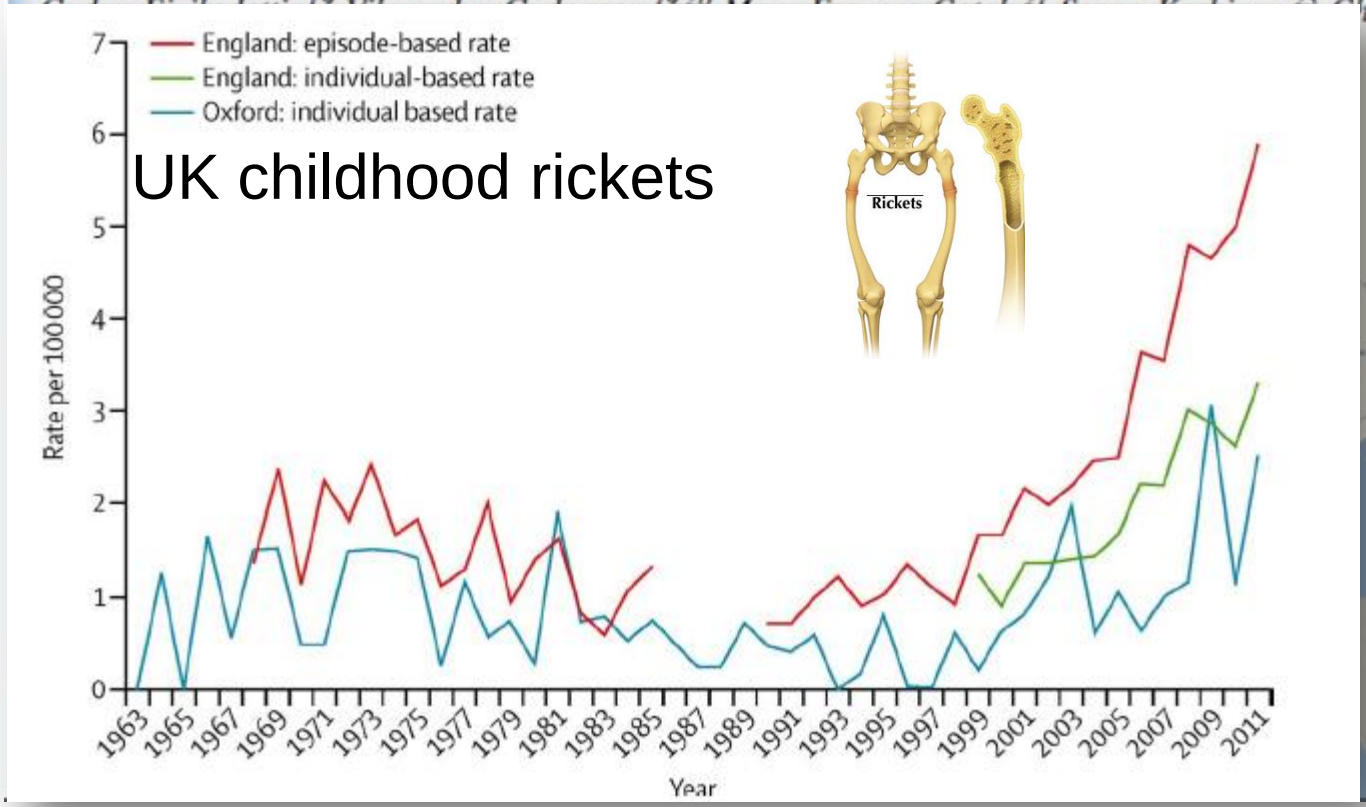
Vitamin D deficiency in Europe: pandemic?[1,2]

doi: 10.3945/ajcn.115.120873.

Kevin D Cashman,[3,4] Kirsten G Dowling,[3] Zuzana Škrabáková,[3] Marcela Gonzalez-Gross,[6,7] Jara Valtueña,[6] Stefaan De Henauw,[8] Luis Moreno,[9] Camilla T Damsgaard,[10] Kim F Michaelsen,[10] Christian Mølgaard,[10] Rolf Jorde,[11] Guri Grimnes,[11] George Moschonis,[12] Christina Mavrogianni,[12] Yannis Manios,[12] Michael Thamm,[13] Gert BM Mensink,[13] Martina Rabenberg,[13] Markus A Busch,[13] Lorna Cox,[14] Sarah Meadows,[14] Gail Goldberg,[14] Ann Prentice,[14] Jacqueline M Dekker,[15] Giel Nijpels,[16] Stefan Pilz,[18] Karin M Swart,[15] Natasja M van Schoor,[15] Paul Lips,[17] ristel Lamberg-Allardt,[24]



Recent studies of UK iodine status

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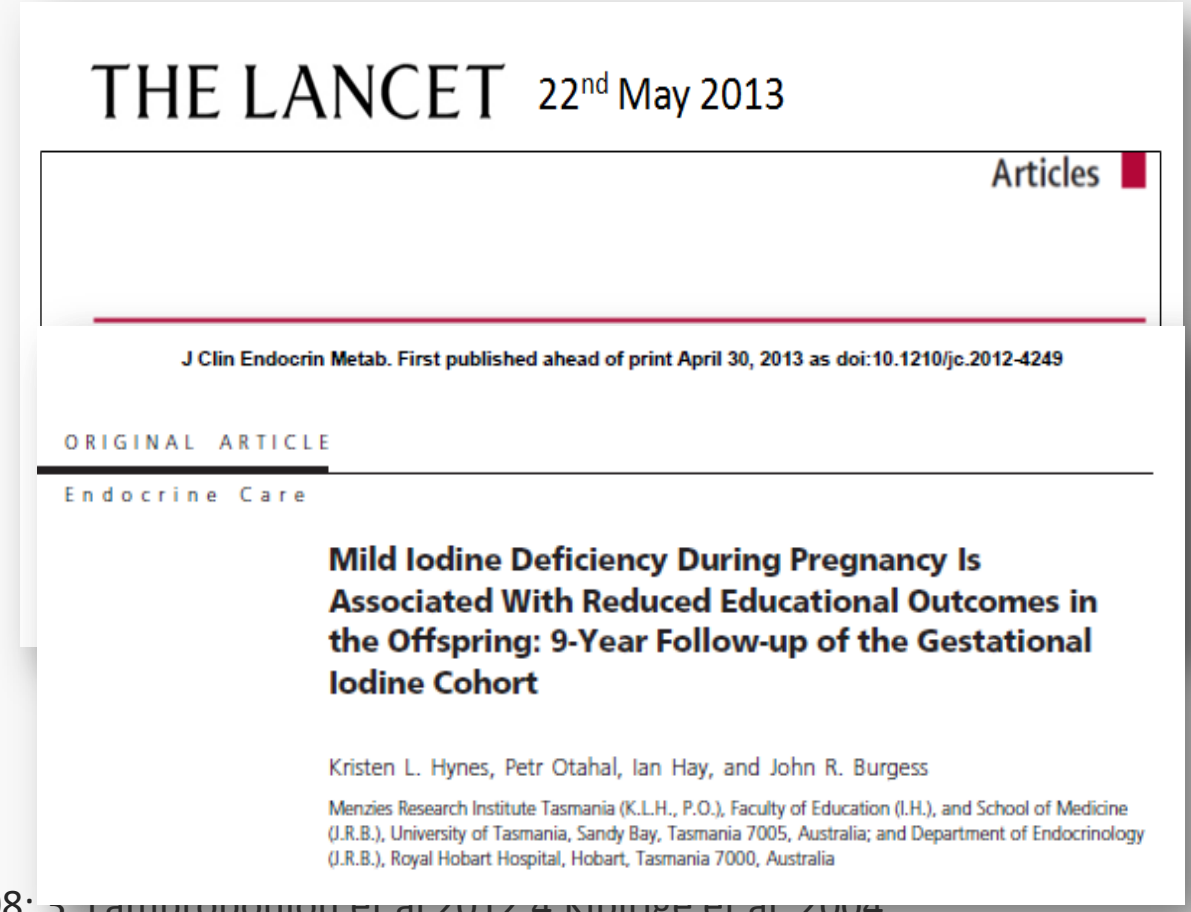
Recent UK studies have shown sub-optimal status in:

- Women of childbearing age[1-3]
- Pregnant women[4-7]



THE LANCET 22nd May 2013

Articles

J Clin Endocrin Metab. First published ahead of print April 30, 2013 as doi:10.1210/jc.2012-4249

ORIGINAL ARTICLE

Endocrine Care

Mild Iodine Deficiency During Pregnancy Is Associated With Reduced Educational Outcomes in the Offspring: 9-Year Follow-up of the Gestational Iodine Cohort

Kristen L. Hynes, Petr Otahal, Ian Hay, and John R. Burgess

Menzies Research Institute Tasmania (K.L.H., P.O.), Faculty of Education (I.H.), and School of Medicine (J.R.B.), University of Tasmania, Sandy Bay, Tasmania 7005, Australia; and Department of Endocrinology (J.R.B.), Royal Hobart Hospital, Hobart, Tasmania 7000, Australia

1. Bath et al. 2008; 2. Rayman et al. 2008; 3. Lampropoulou et al 2012 4.Kibirige et al. 2004; 5.Barnett et al. 2002; 6. Bath et al. 2010; 7. Pearce et al 2010

Milk intake and 24 h iodine excretion

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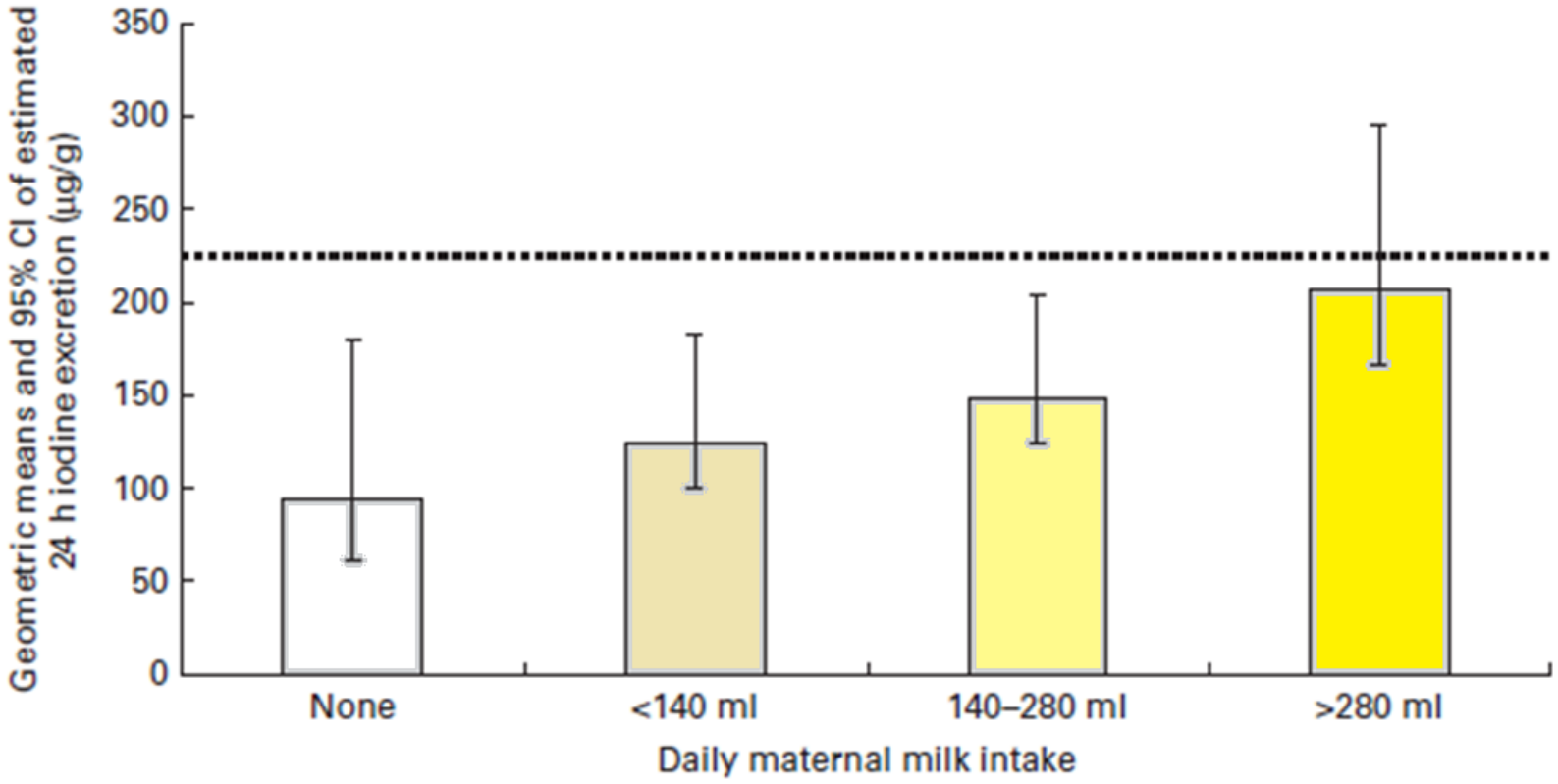
Bath et al. (2013)



Type of UK retail milk and iodine content

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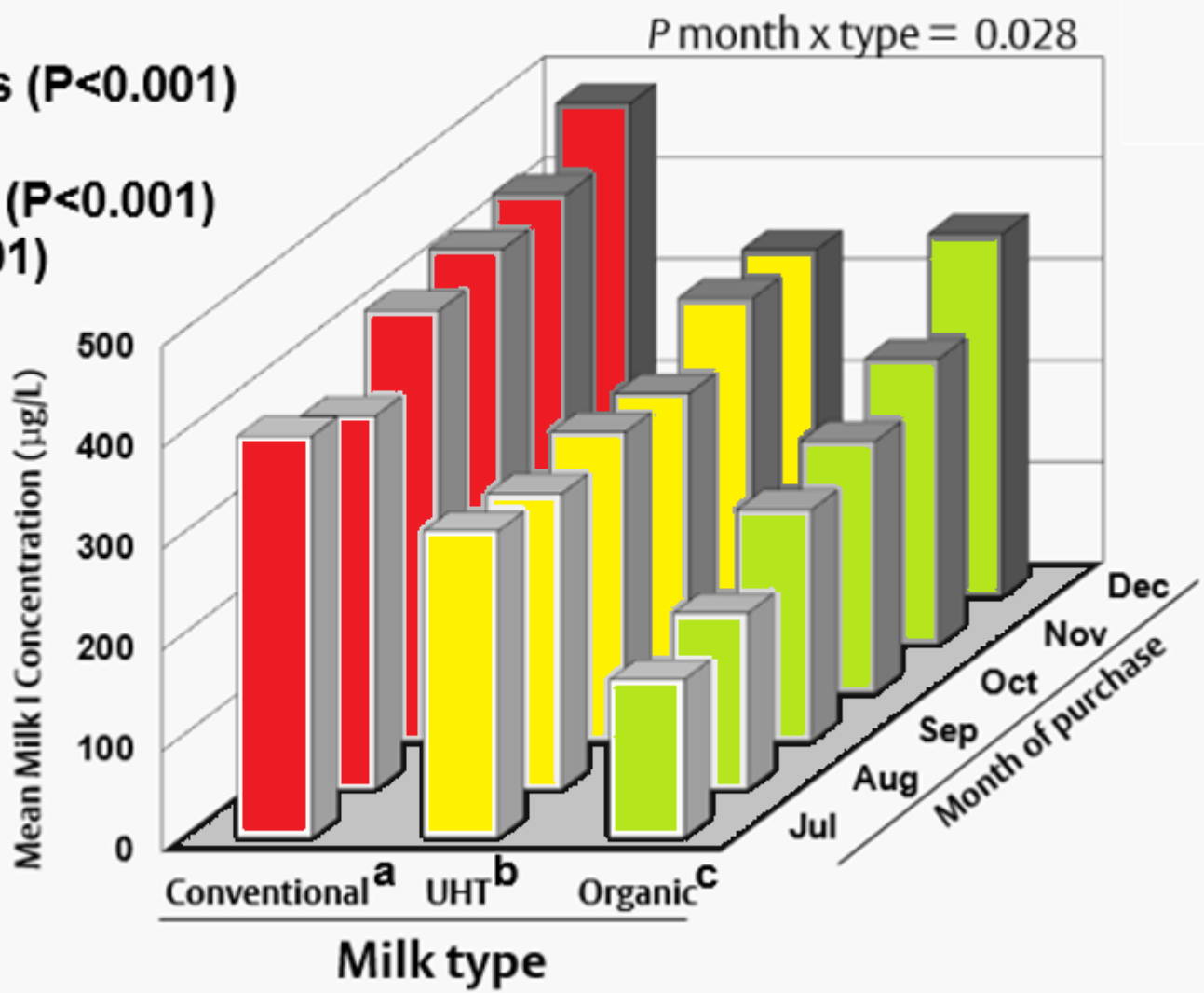
Stevenson et al. (under review)

4 supermarkets (P<0.001)
2 regions (NS)
6 months 2015 (P<0.001)
3 types (P<0.001)



Two other issues related to iodine

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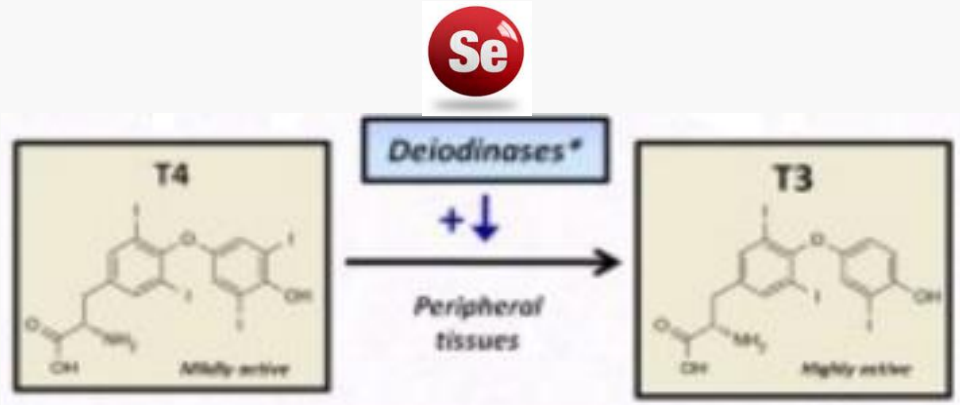
- 


UK RNI (µg/d)	140
WHO RNI (µg/d)	150

140
250

- 

Sucrose-sweetened beverages increase fat storage in liver, muscle and visceral fat

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MIDDLE AND OLDER AGE

Recent meta-analyses of prospective studies on dairy and cardiometabolic diseases

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Dairy	Outcome	RR (95% CI)	Ref
Milk	AC mortality	1.00 (0.93-1.07)	**Guo et al., 2017**
Milk	CVD	1.01 (0.93-1.10)	**Guo et al., 2017**
Cheese	CVD	**0.98** (0.95-1.00)	**Guo et al., 2017**
Milk	Stroke	**0.93** (0.88-0.98)	**De Goede et al., 2016**
Cheese /40 g/d	Stroke	0.97 (0.94-1.01)	**De Goede et al., 2016**
Yoghurt/80g/d	Diabetes	**0.86** (0.83-0.90)	**Gijsbers et al., 2016**

What about saturated fats and CVD?

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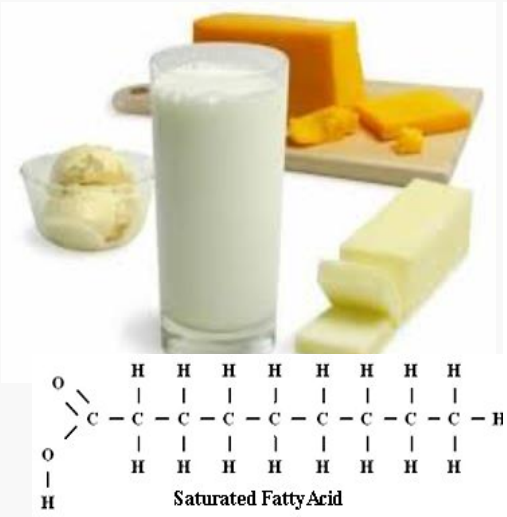
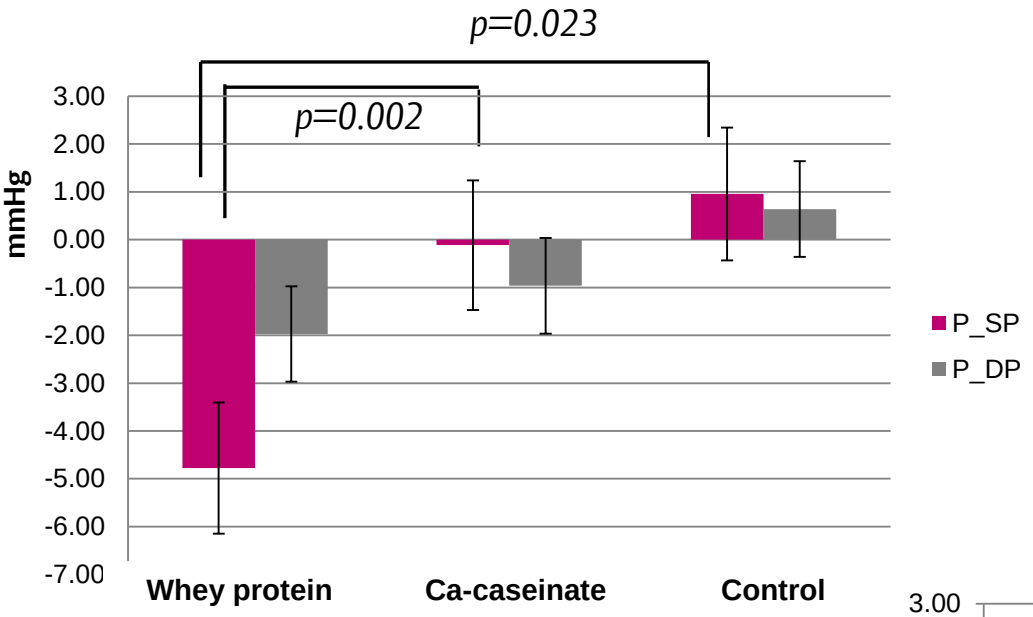


For most people dairy foods are the biggest source of SFA (just!)

Milk proteins and…

Peripheral SBP & DBP



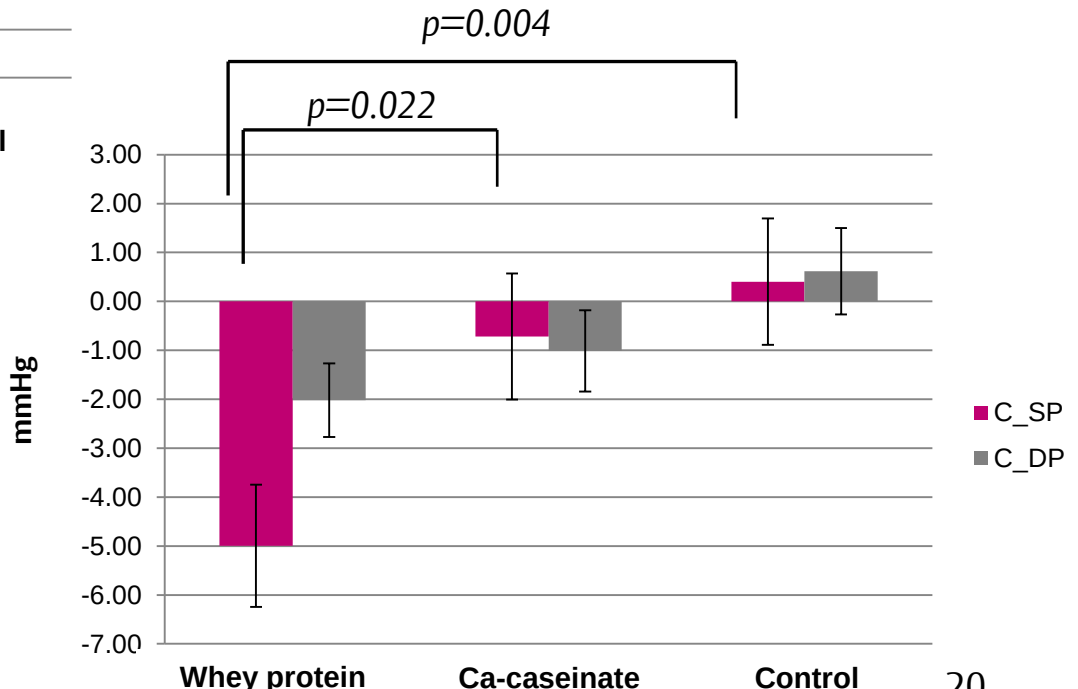
Overall treatment effect for P_SBP p=0.007,
Overall treatment effect for P_DP p=0.095,
Overall treamtent effect for P_MeanP p=0.009

n=38, Means ± SEM

Central SBP & DBP

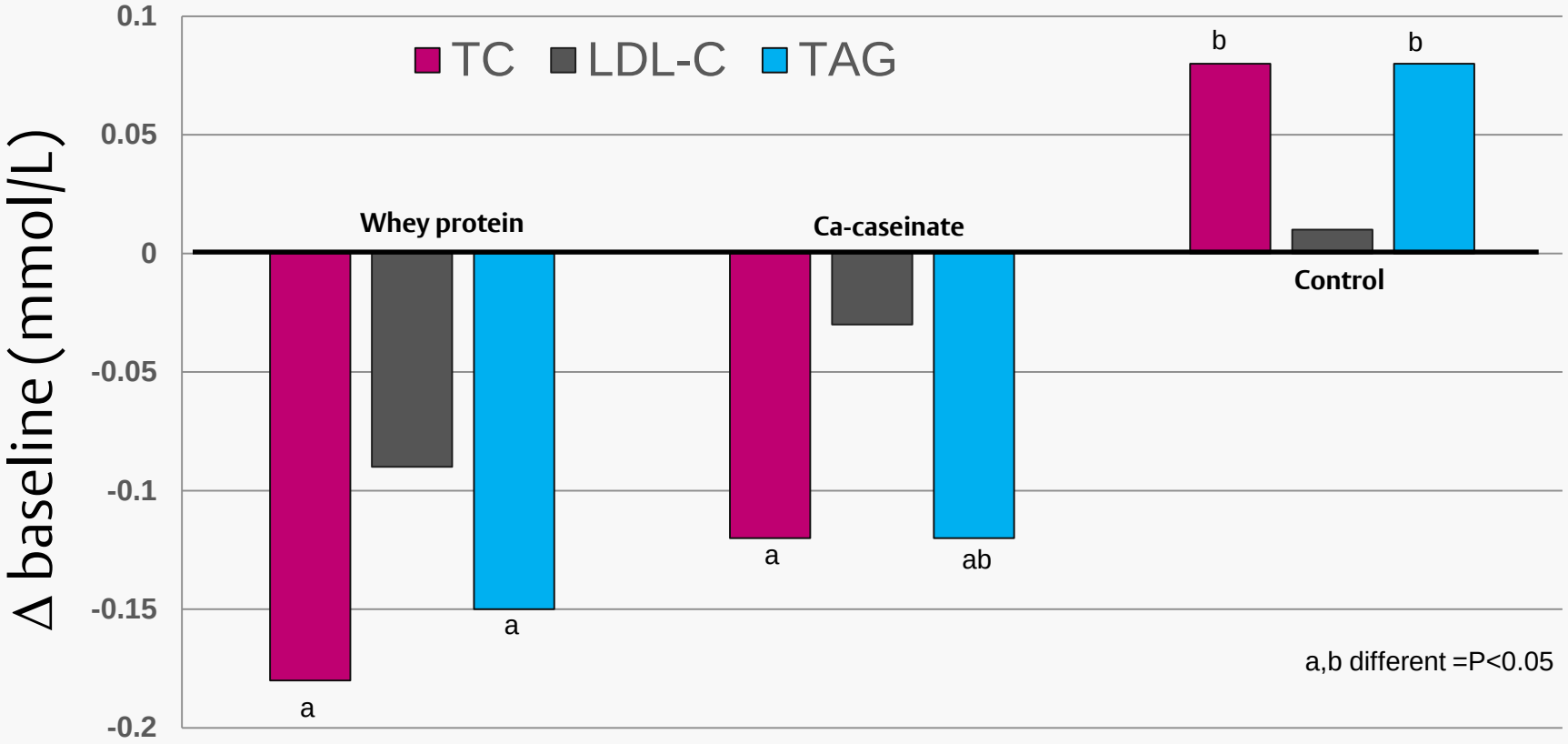
Overall treatment effect for C_SBP p=0.010,
Overall treatment effect for C_DP p=0.094,
Overall treatment effect for C_MeanP p=0.024

n=38, Means ± SEM



Fekete et al., AJCN (2016)

Milk proteins and blood lipids



Fekete et al., AJCN (2016)

Changes in total and LDL-chol after consumption of ~80 g/d fat (~36g/d SFA) as cheese or butter

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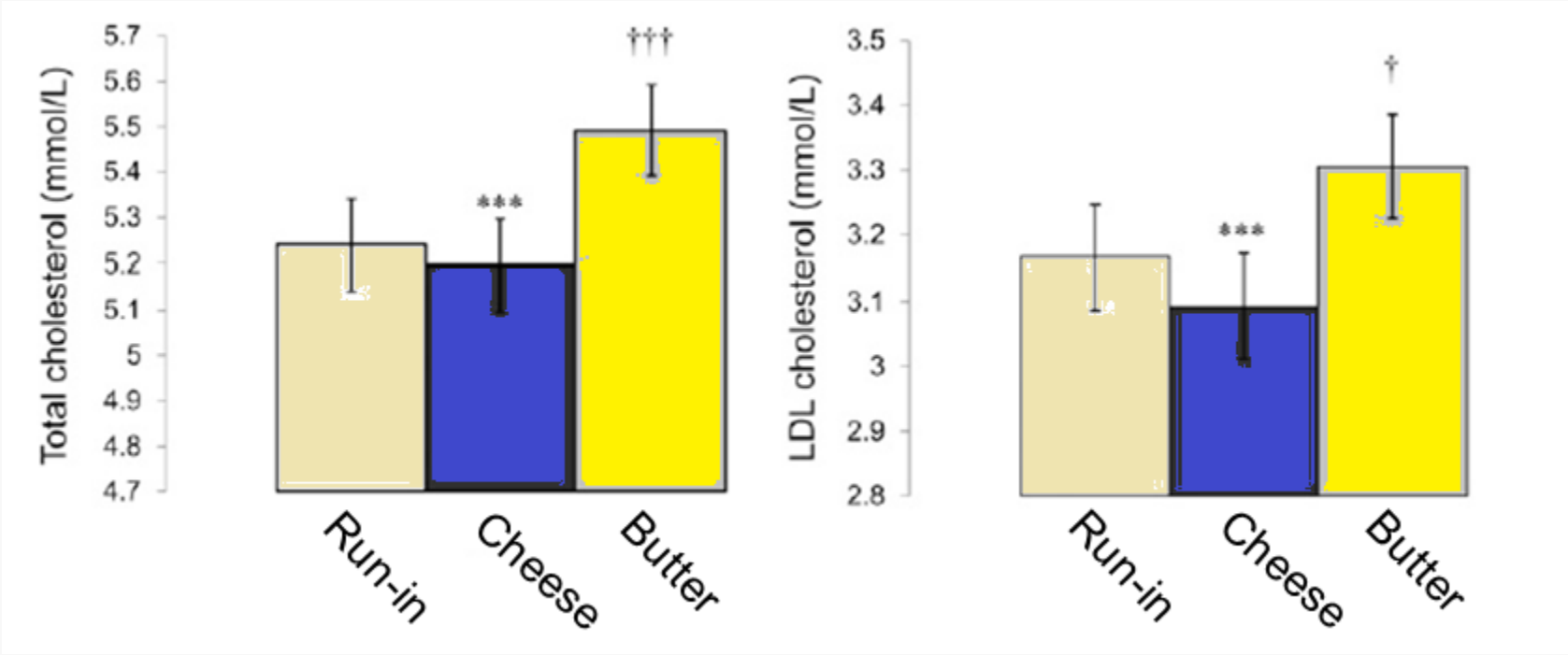
Cheese vs butter $^{***}P < 0.0001$. †,†††Significantly different from run-in period: $^{\dagger}P < 0.05$, $^{\dagger\dagger\dagger}P < 0.0005$.



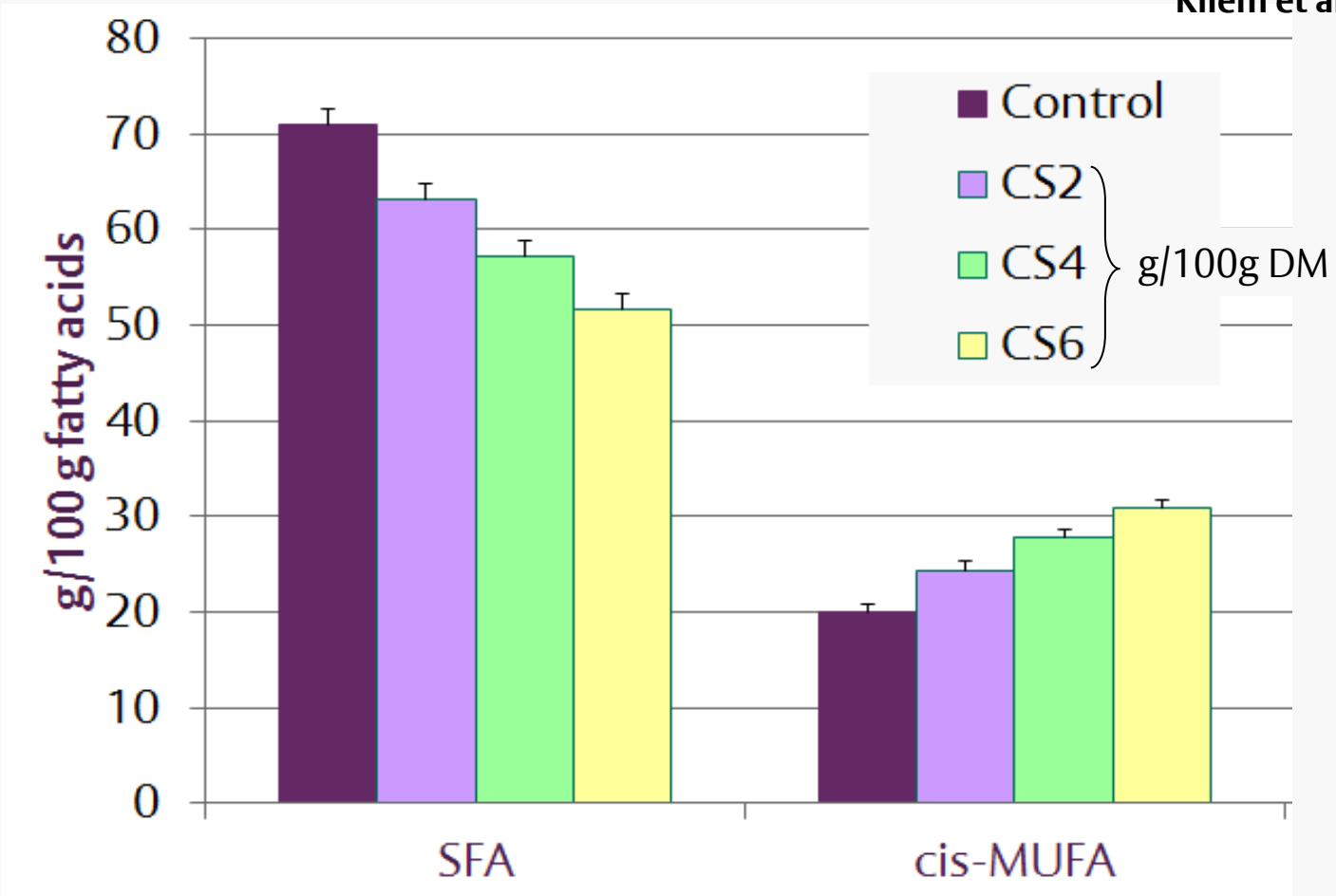
Hjerpsted et al. Am J Clin Nutr 2011;94:1479–84.

THE FOOD MATRIX

Replacing saturated fat in milk fat

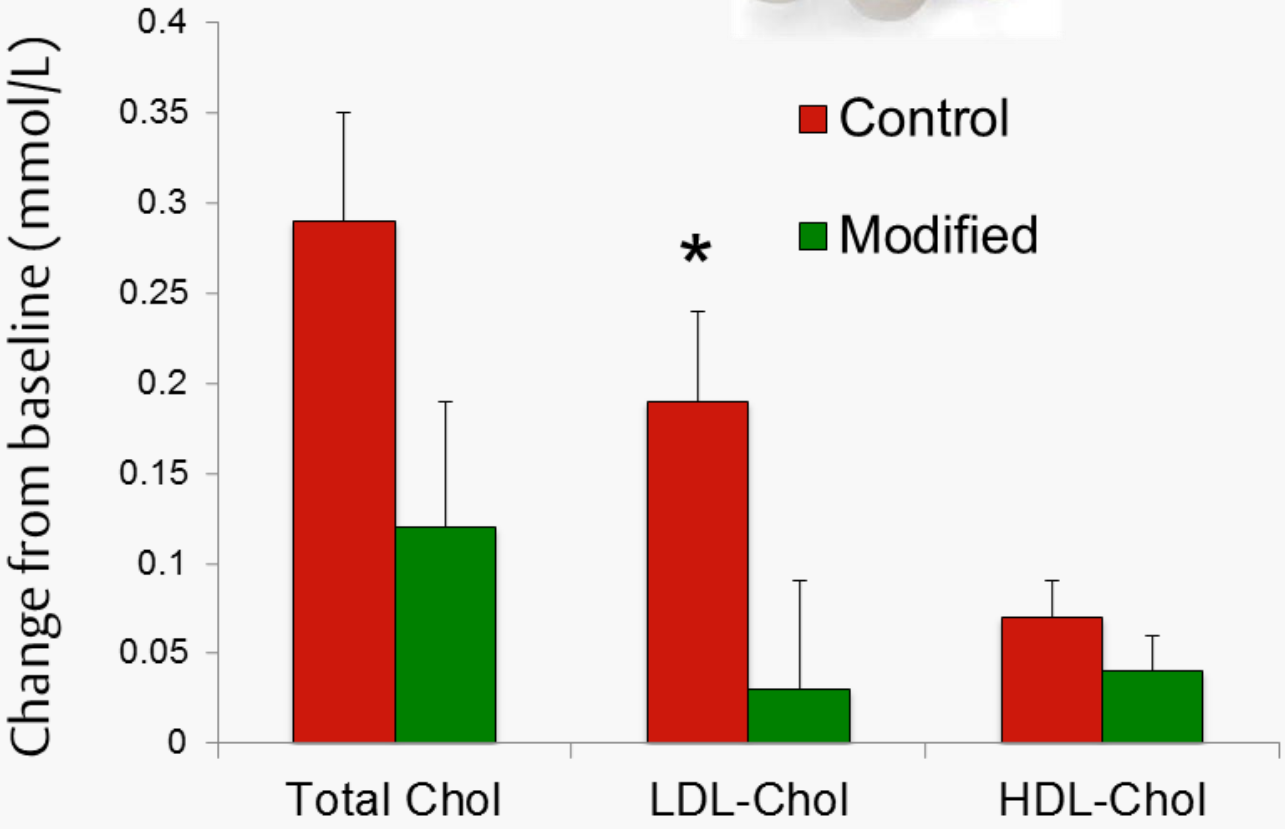
Ca soap (CS) of oleic acid study

Kliem et al., JDS 2013



Fasting blood cholesterol

Markey et al. (under review)



* $P < 0.05$

Also a trend for a beneficial reduction in markers of insulin resistance

A few conclusions…

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- **Milk/dairy foods are key sources of important nutrients**
- **Composition can be influenced by primary production**
- **Declines in consumption esp. young females have already had consequences……**
- **Risk of poor bone development especially in girls is concerning and may become a major issue**
- **Functionality of some dairy foods beyond nutrient supply**
- **No evidence of increased risk of CVD from high dairy consumption despite SFA**
- **Negative association of milk proteins and milk/fermented dairy and BP and T2DM may become the most important findings but needs development.**
- **Dietary pattern, nutrition and health must be included in any debate about sustainable food production**


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THANK YOU