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Organic Food Quality - Update on studies into composition differences and health impacts

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'Organic nosh not healthier'

Trendy ... organic grub

UK- Food Standards Agency (FSA) sponsored study Dangour et al 2009

Evidence that organic production methods affect the nutritional composition of crops, dairy products and meat

New evidence for composition differences between organic and conventional crops

Barański, M., Średnicka-Tober, D., Volakakis, N., Seal, C., Sanderson, R., Stewart, G.B., Benbrook, C., Biavati, B., Markellou, E., Giotis, H., Gromadzka-Ostrowska, J., Rembiałkowska, E., Skwarło-Sonta, K.,, Tahvonen, R., Janovská, D., Niggli, U., Nicot,P. and Leifert, C. (2014)

Higher antioxidant and lower cadmium concentrations and lower incidence of pesticide residues in organically grown crops: a systematic literature review and meta-analysis.

***British Journal of Nutrition* 112,** 794-811

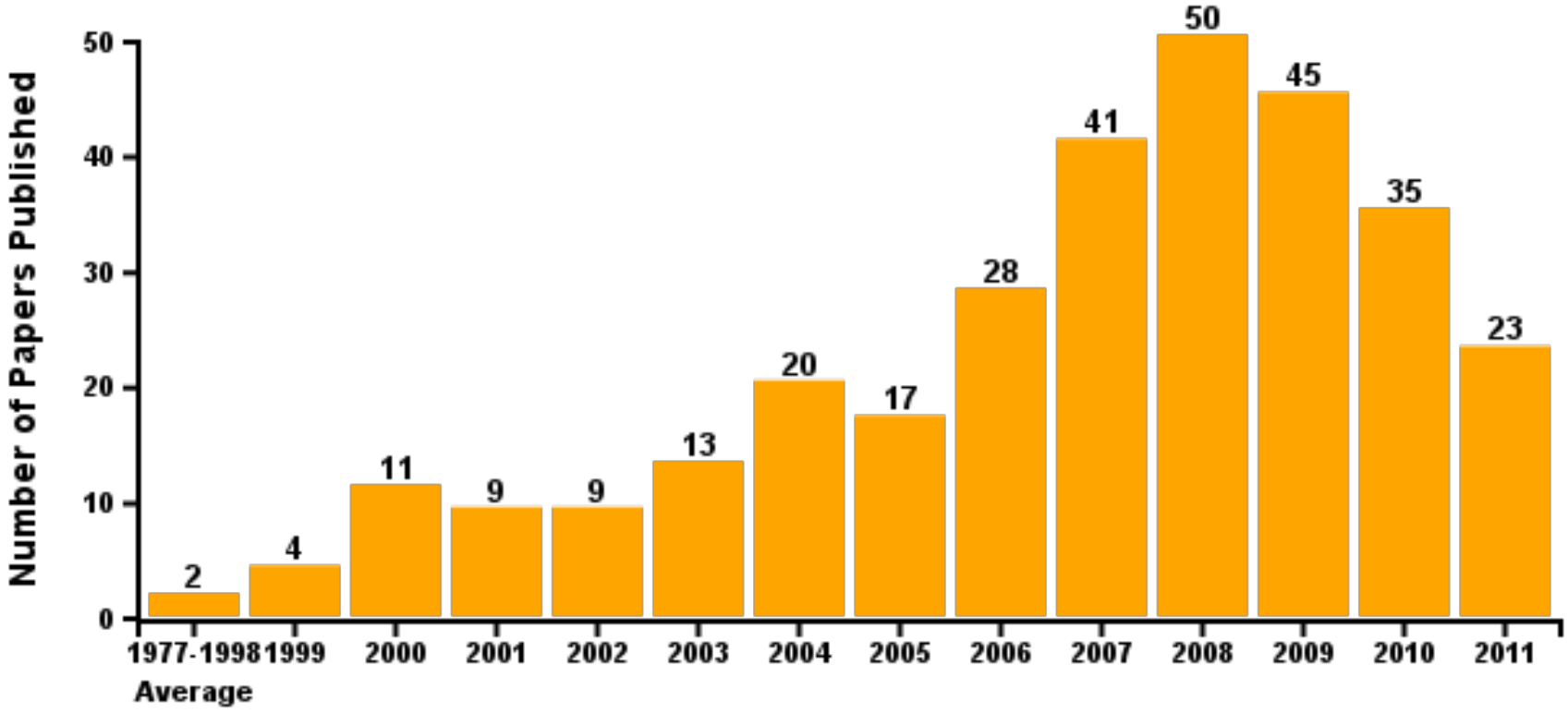
For more information see:

http://research.ncl.ac.uk/nefg/QOF

Systematic literature review: 343 peer-reviewed papers

FSA study (Dangour et al. 2009): 46 papers only!
(on crops, meat and dairy)

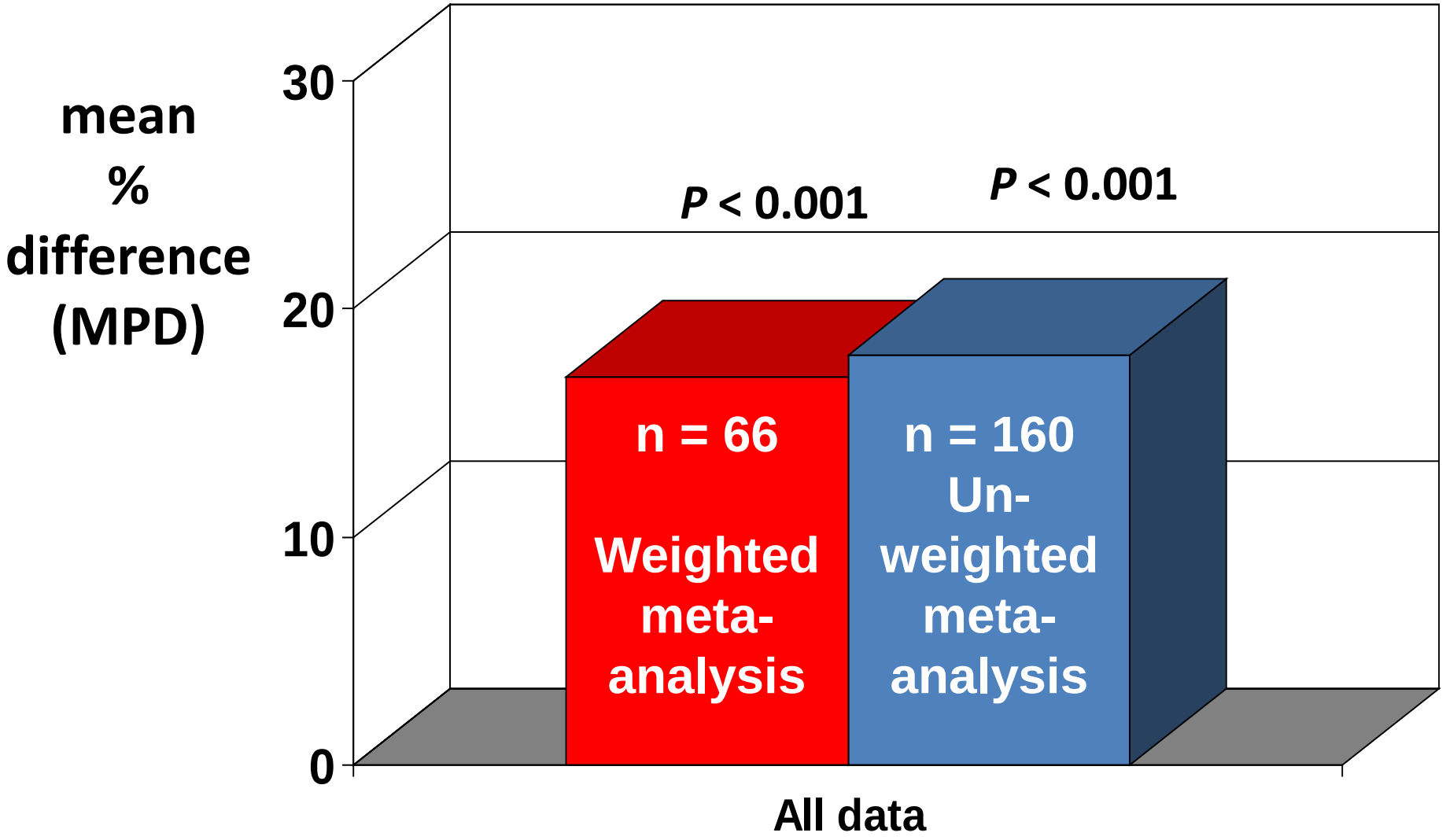
Figure 1: Number of Papers Published by Year



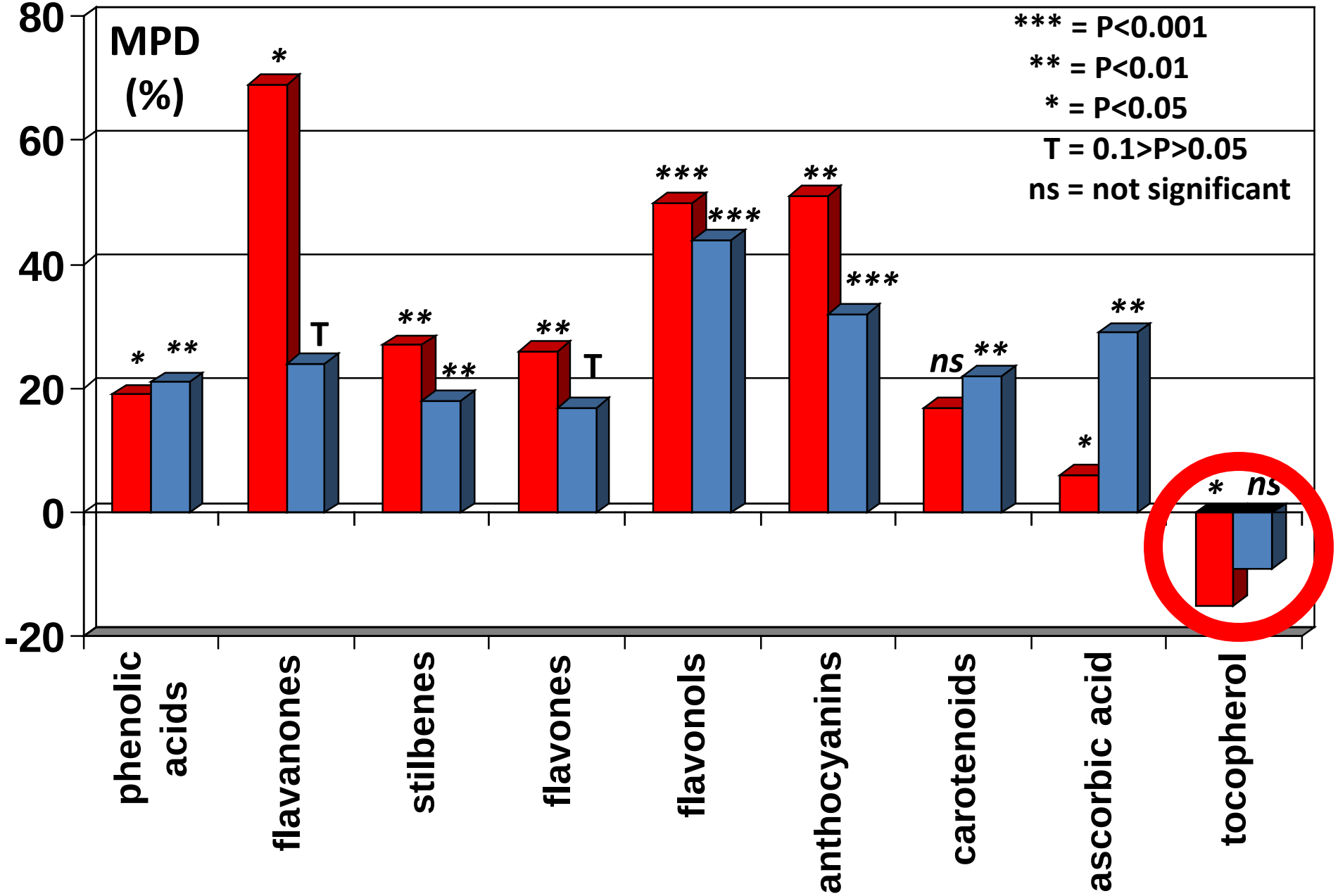
Notes: 17% of studies were published before 2002. 45% were published from 2008-2011, and since the Dangour et al. review, 17% of studies from 2010-2011.
Source: Supplemental Figure 1 in the published paper.

Primary assessment – antioxidant activity

is significantly higher in organic crops

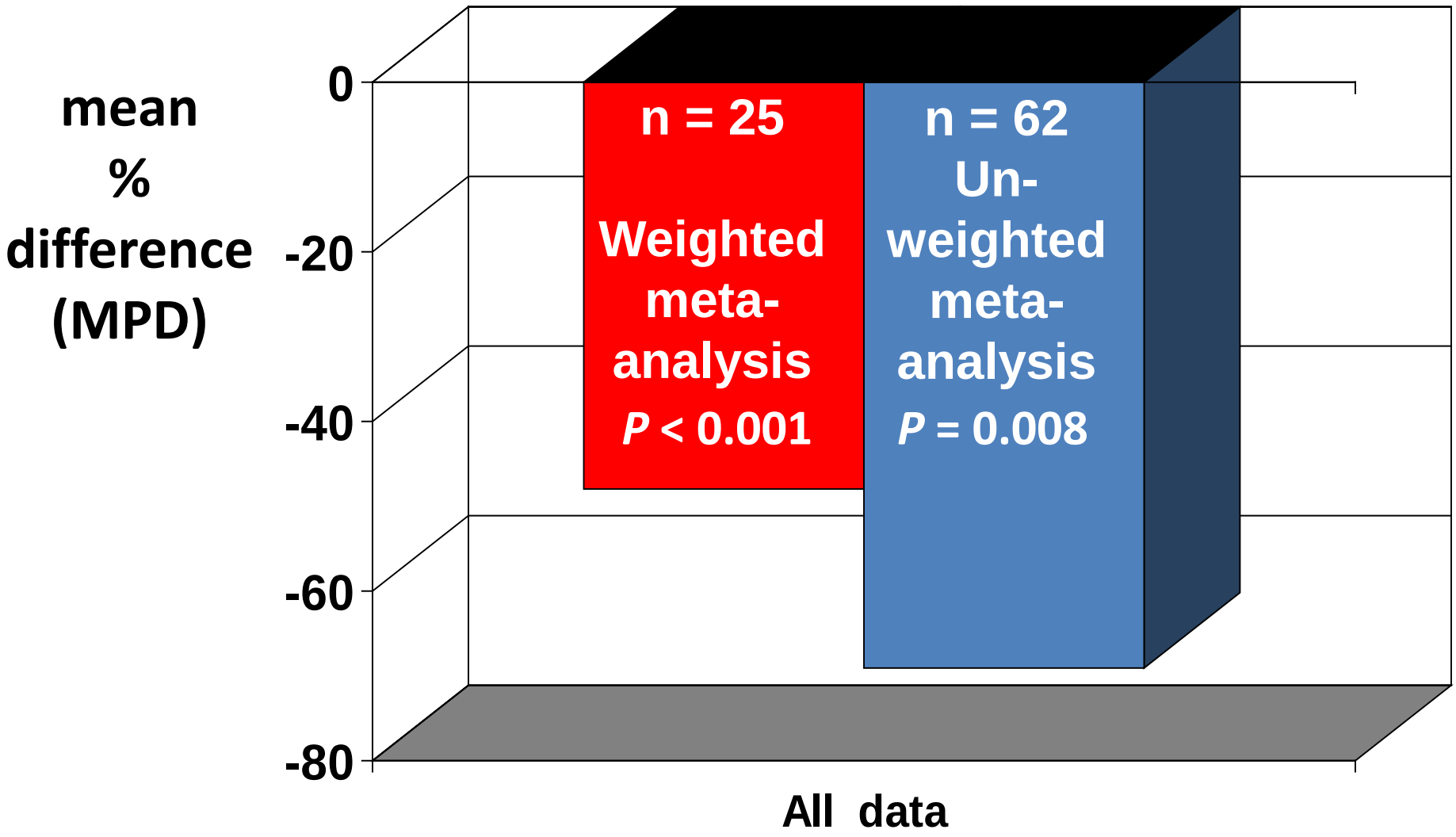


Explanatory assessments – antioxidant compounds



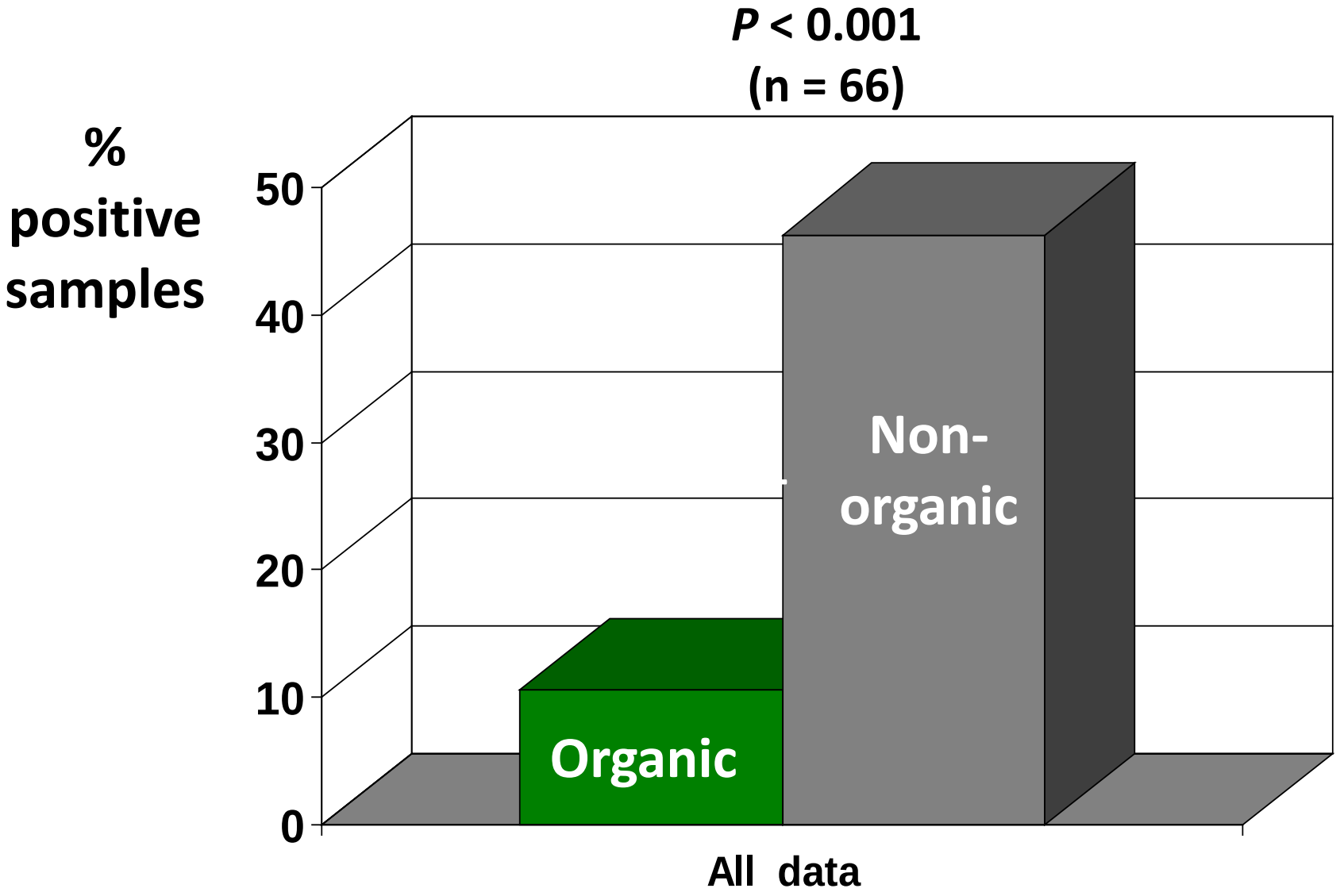
Primary assessment – cadmium concentration

are significantly lower in organic crops



Primary assessment – pesticide residues

are less frequently detected in organic crops



Pesticide concentrations in organic and conventional crops

- There were too few studies/data-sets to compare pesticide concentrations in organic and conventional crops
- In the few individial studies where pesticide concentrations were compared, concentrations in conventional crops were 10 to 100 times higher
- **Why is the frequency of pesticide residues lower in organic crops?**
  - The use of synthetic chemical pesticides is prohibited in organic farming
  - Organic farmers stick to the rules!!!!

Composition differences between organic and conventional milk during the outdoor grazing and winter indoor period

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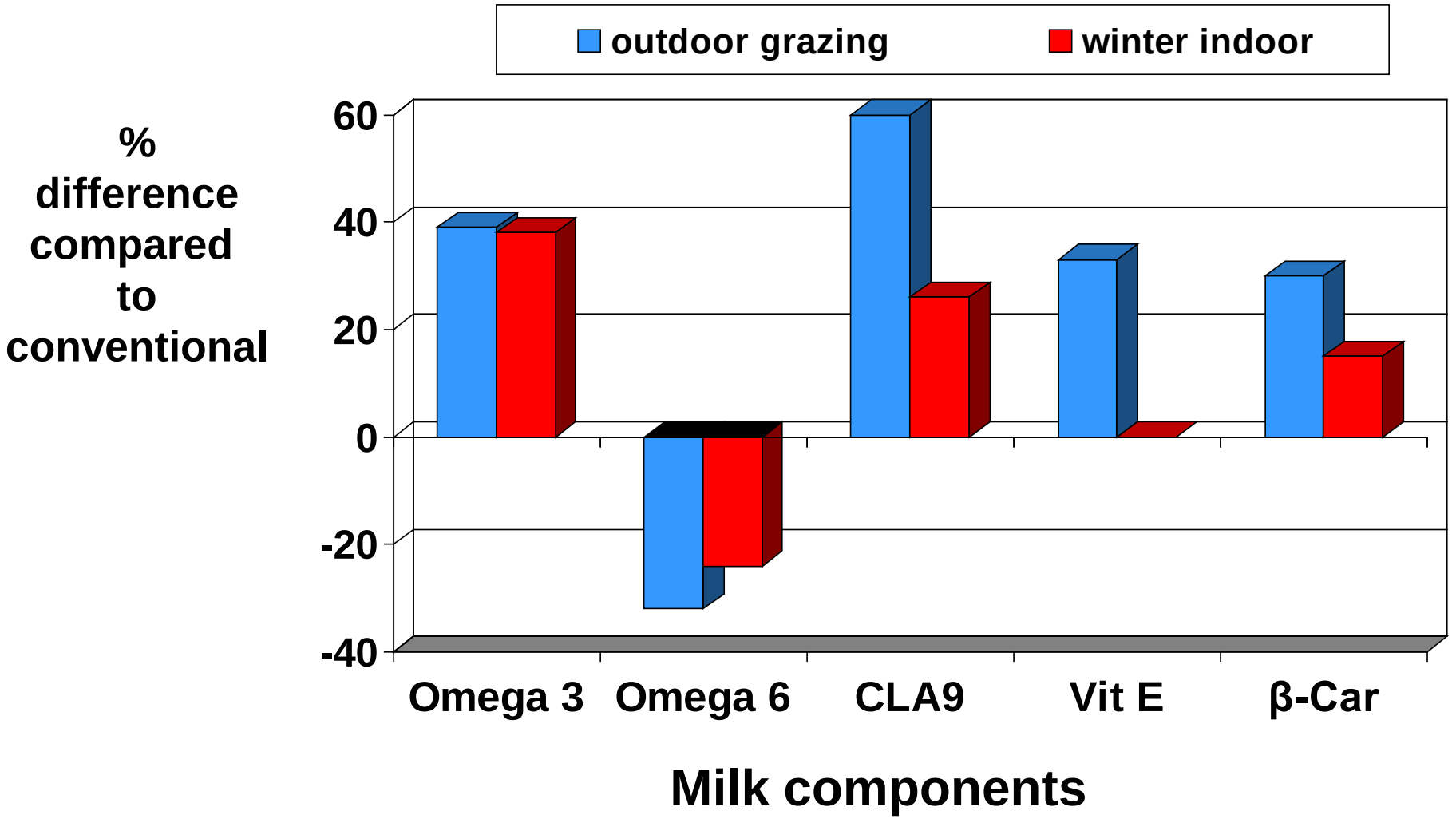

Omega 3 level in milk from conventional and organic dairy herds in different EU countries (annual average)

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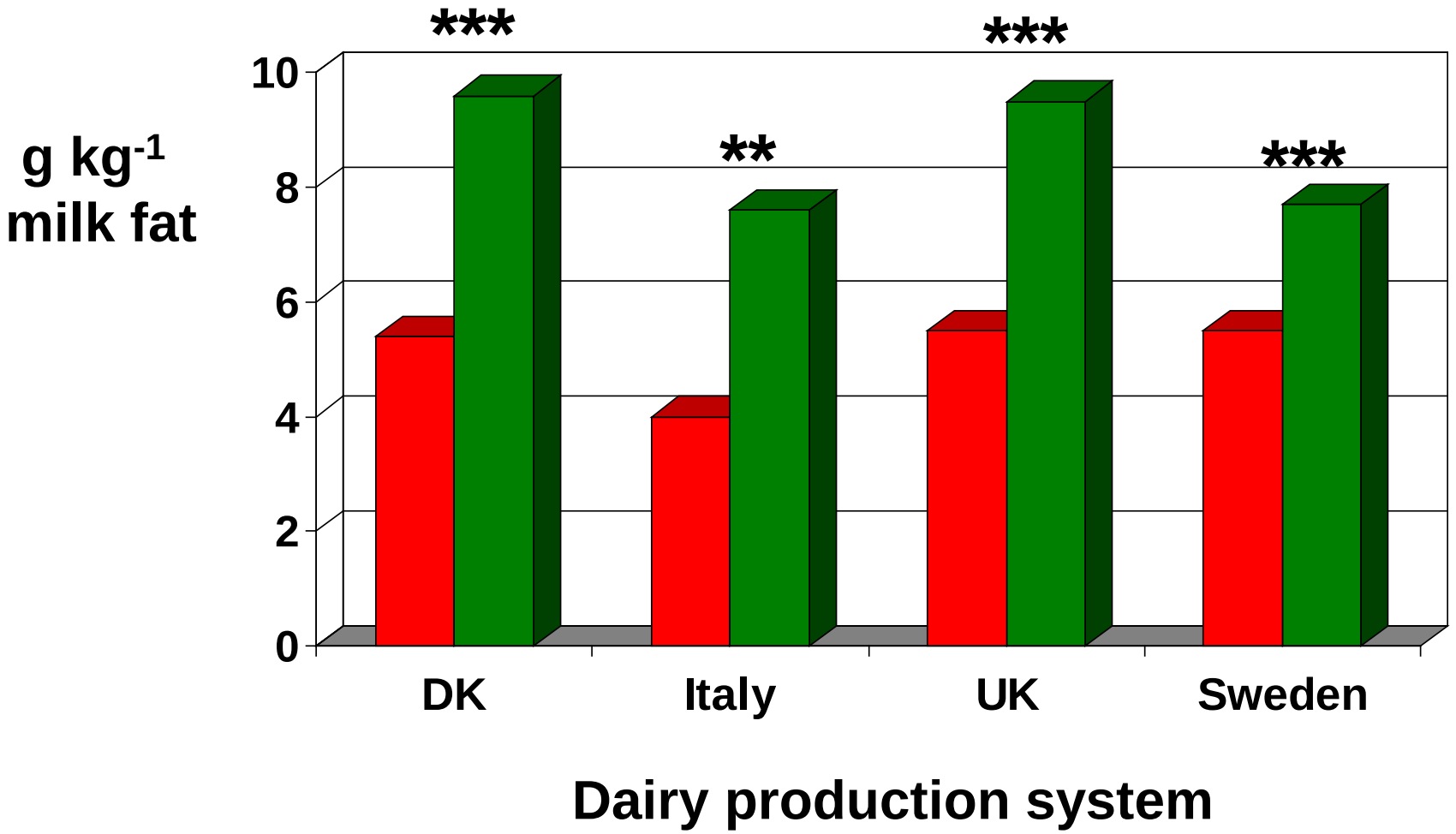

NEFG – UK studies on composition differences between organic and conventional milk

- Stergiades, S. et al. (2015) A 2-year study on **milk quality** from three pasture-based dairy systems of contrasting production intensities in Wales. *The Journal of Agricultural Science* **153,** 708-731.
- Stergiadis, S., et al. (2014) Improving the **fatty acid profile** of winter milk from housed cows with contrasting feeding regimes by oilseed supplementation. *Food Chemistry* **164**, 293–300.
- Stergiadis, S. et al. (2012) Effect of feeding intensity and milking systems on nutritionally relevant milk components in dairy farming systems in the north east of England. *Journal of Agricultural and Food Chemistry* **60**, 7270-7281**.**
- Butler, G., et al. (2011) The effects of dairy management and processing on **quality** characteristics of milk and dairy products. *NJAS-Wageningen Journal of Life Science (NJAS)* **58**, 97-102.
- Butler, G., et al. (2011) **Fat** composition of organic and conventional retail milk in North East England. *Journal of Dairy Science*, **94**, 24-36.
- Butler. G. et al. (2008) **Fatty acid** and fat soluble **antioxidant** concentrations in milk from high and low input conventional and organic systems; seasonal variation. *Journal of Science of Agriculture and Food*, **88**, 1431-1441.

Evidence that organic food consumption has a positive impact on human health?

- until recently, there were no cohort or dietary intervention studies into the effect of organic crop food consumption
- these types of studies are extremely expensive
- now there is published evidence (4 papers) from:
  1. one Norwegian cohort study involving 28192 pregnant women
  2. two smaller cohort studies from The Netherlands and Denmark

  linking organic vegetable or dairy production to positive health outcomes

Evidence for positive health impacts of organic crop consumption

Hanne Torjusen, Anne Lise Brantsæter, Margareta Haugen, Jan Alexander, Leiv S Bakketeig, Geir Lieblein, Hein Stigum, Tormod Næs, Jackie Swartz, Gerd Holmboe-Ottesen, Gun Roos, Helle Margrete Meltzer

Reduced risk of pre-eclampsia with organic vegetable consumption: results from the prospective Norwegian Mother and Child Cohort Study

***British Medical Journal (BMJ) Open* 2014**

doi 10.1136/bmjopen-2014-006143

Evidence for positive health impacts of organic vegetable and milk/dairy consumption

Christensen, J.S. et al. (2013) Association between organic dietary choice during pregnancy and **Hypospadias** in offspring: A study of 306 boys operated for hypospadias. *The Journal of Jurology* **189**, 1077-1082

- ***"frequent consumption of high fat dairy products (milk, butter) while rarely or never choosing the organic alternative to these products during pregnancy was associated with increased odds of hypospadia"***

Brantsæter, A.L. et al. (2015) Organic food consumption during pregnancy and **Hypospadia** and **Cryptorchidism** at birth: The Norwegian Mother and Child Cohort Study (MoBa). *Environmental Health Perspectives* **on line**, doi 10.1289/ehp.1409518

- **organic food consumption was associated with lower odds of hypospadia**
- **closest associations were found with organic vegetable and milk/dairy product consumption**

Evidence for positive health impacts of organic crop consumption

Kummeling I, Thijs C, Huber M *et al.* (2008) Consumption of organic foods and risk of **atopic disease** during the first 2 years of life in the Netherlands. *British Journal of Nutrition* **99**, 598-605.

- **linked organic dairy consumption to a significantly lower incidence in eczema in infants**


Thank you