

Why are we interested in iodine & milk?

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Questions?

- Why is iodine important?
- How much do we and our cows need?
- How much is supplied in various foods and feeds?
- Evidence that organic milk is low in iodine?
- What have we done about it?
- Can we or our cows have too much?

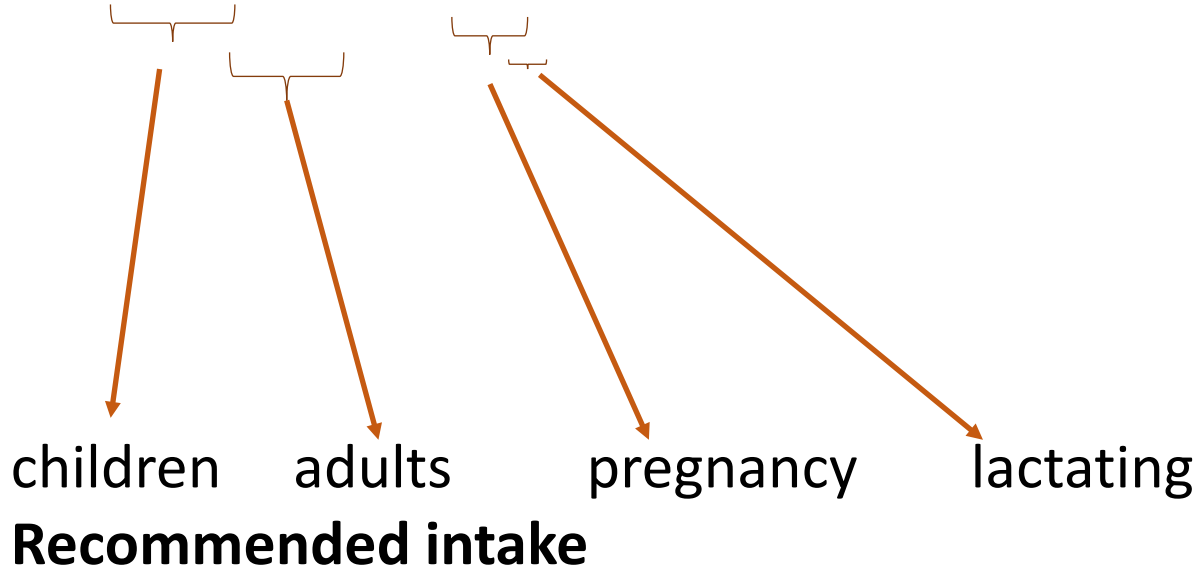


Why is iodine important

- Essential – part of thyroid hormones, controlling metabolic rate, reproduction & foetal development
- Deficiency signs: goitre -> insufficient thyroxin
 - Cattle: poor fertility, weak, hairless calves & impaired brain development
 - Man: impaired brain development, reduced cognitive function (cretinism)
- WHO and unicef – programme to eliminate *world's greatest cause of preventable brain damage* (using iodised salt, accessed by ~70% global households)
- UK - Scientific Advisory Committee on Nutrition - statement on iodine and health, Feb 2014

Requirements for iodine: cattle

- It depends....
 1. Varies between summer and winter 0.1 → 0.5 mg per kg diet dry matter
 2. Heavily influenced by dietary antagonists (goitrogens) found in; brassicas, legumes (clovers and soya) ...suggestion for additional 2mg I/kg DM
 3. Uptake influence by selenium

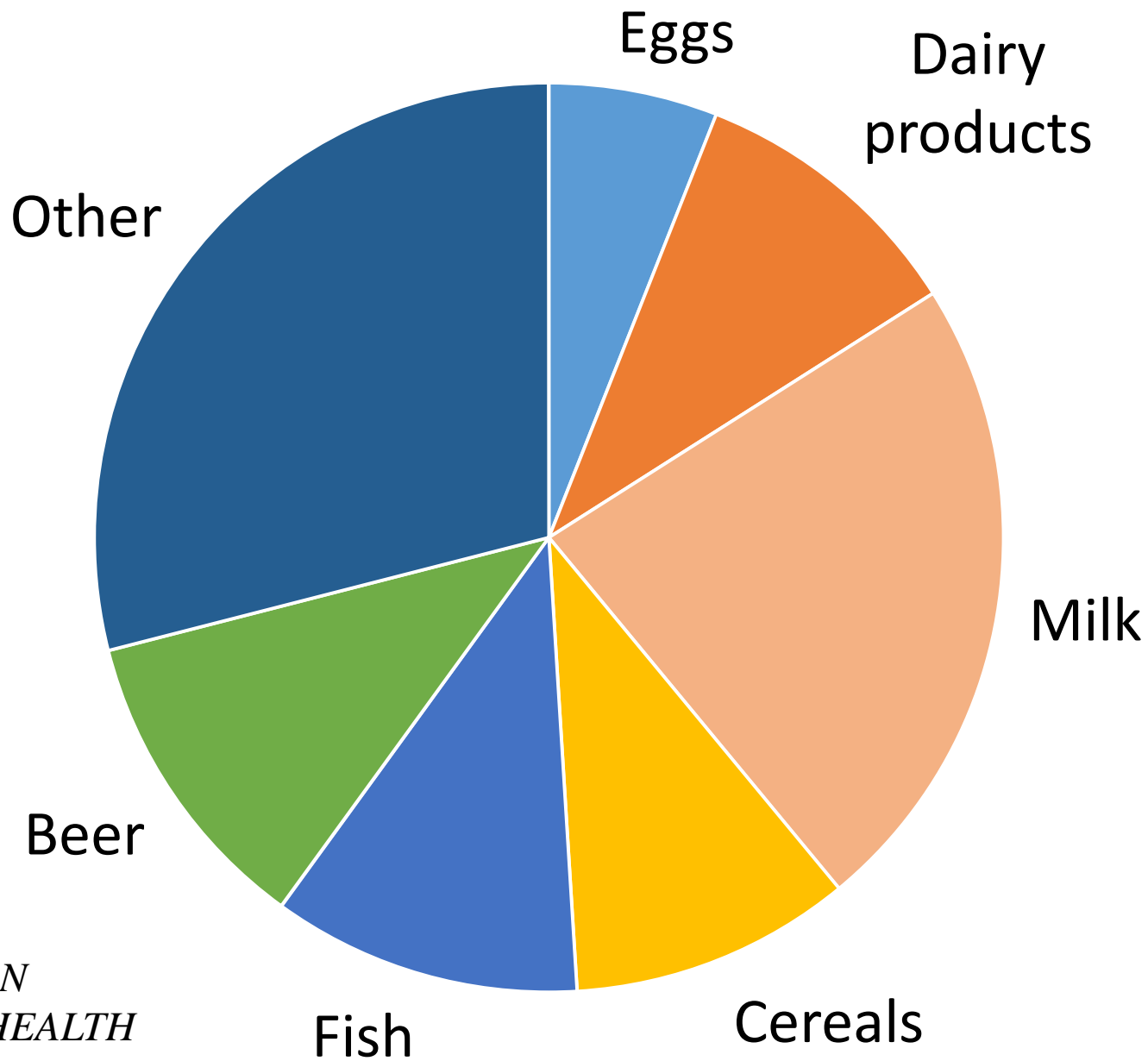


How much do WE need?

Meeting cows' requirements natural supply v supplementation

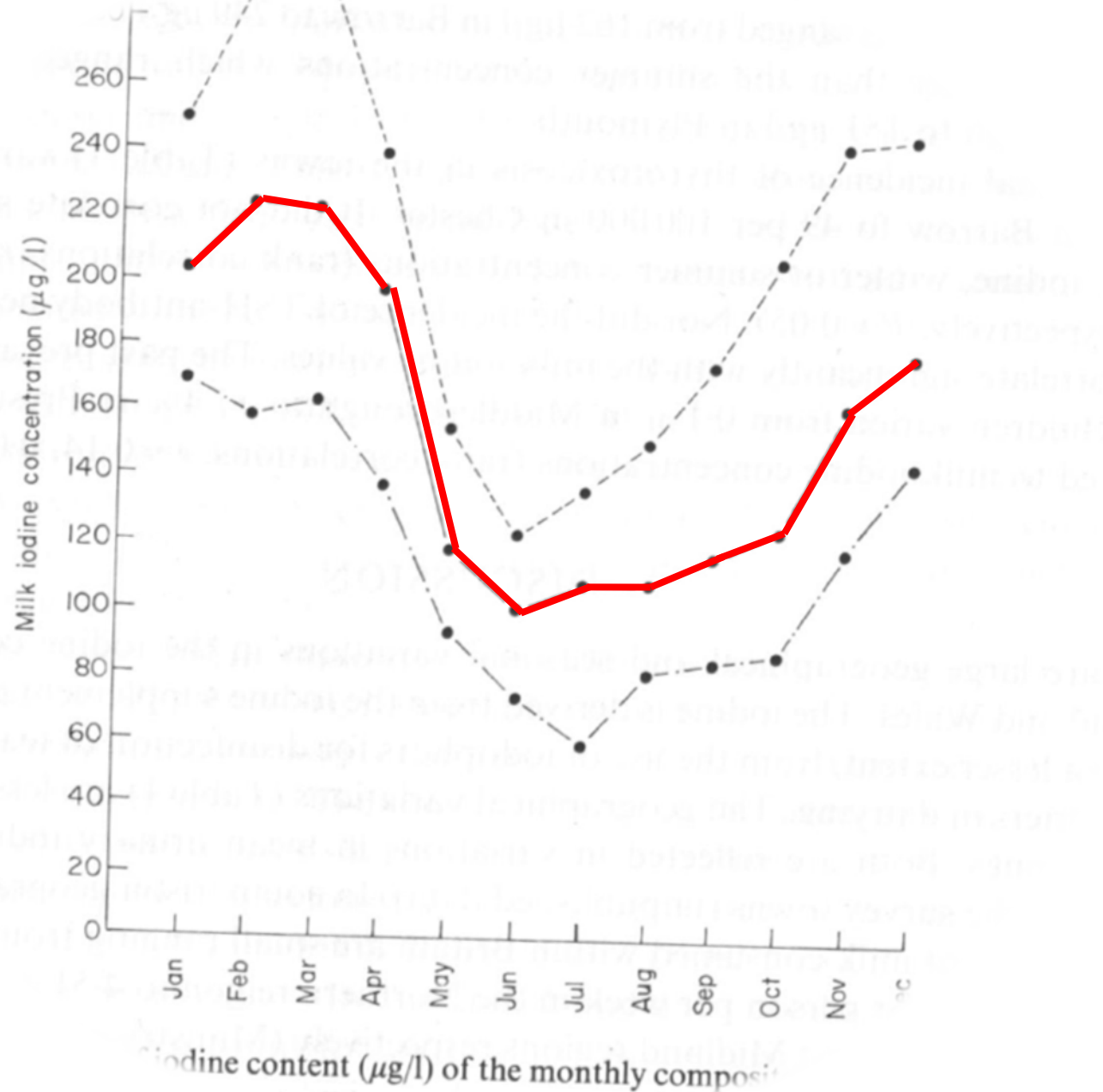
- Uptake by plants - soil levels and proximity to coast
- Herbage: levels decline as plants mature eg 180-350
→ 20-149mg/kg DM... low, more often than not
- Cereal grain much lower than forages
- Don't forget goitrogens
- Supplementation: fortification of minerals, boluses, via water, skin application (teat dips?), seaweed products

UK dietary iodine intake (2008-2010)

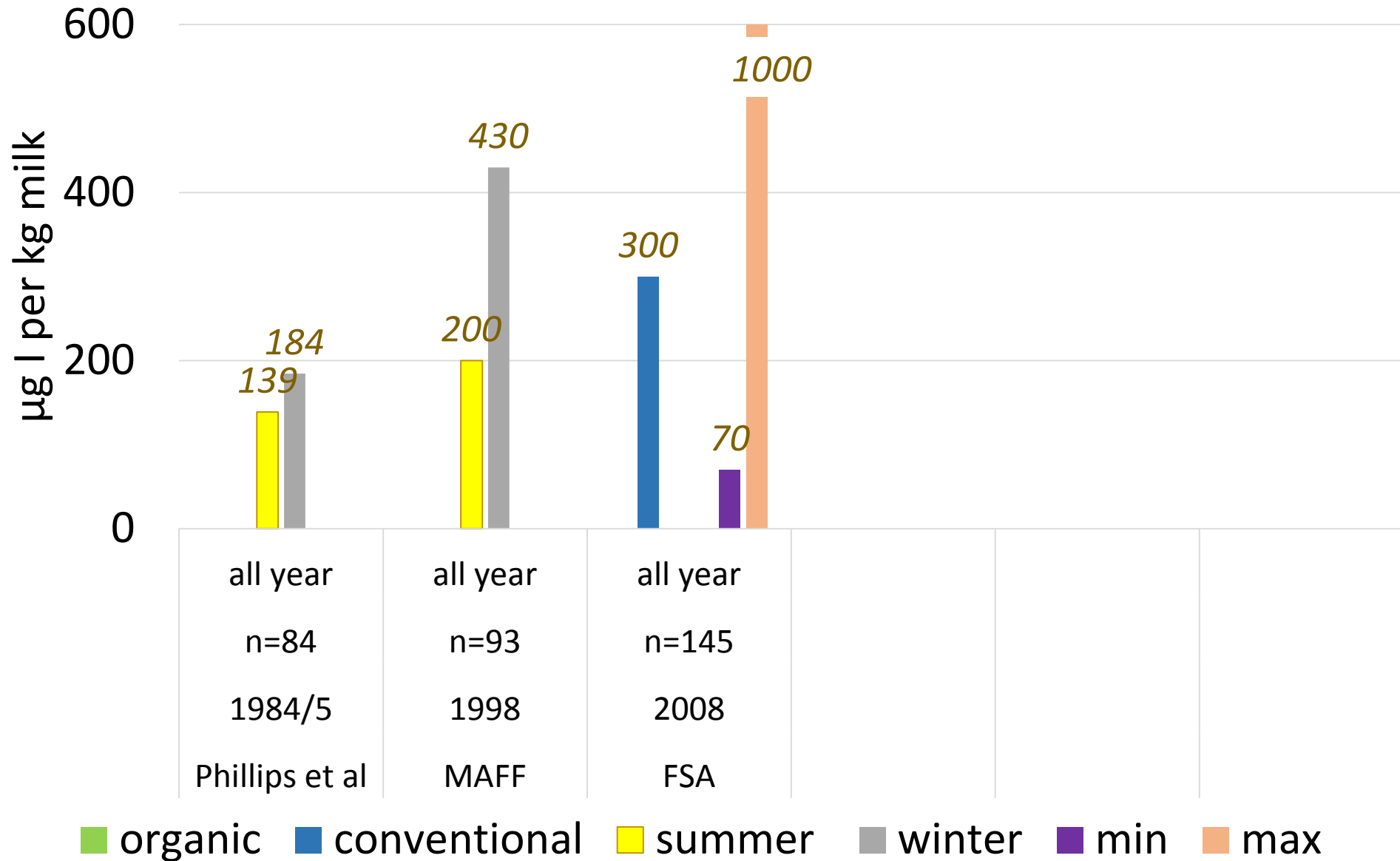


Iodine content of milk

Variable

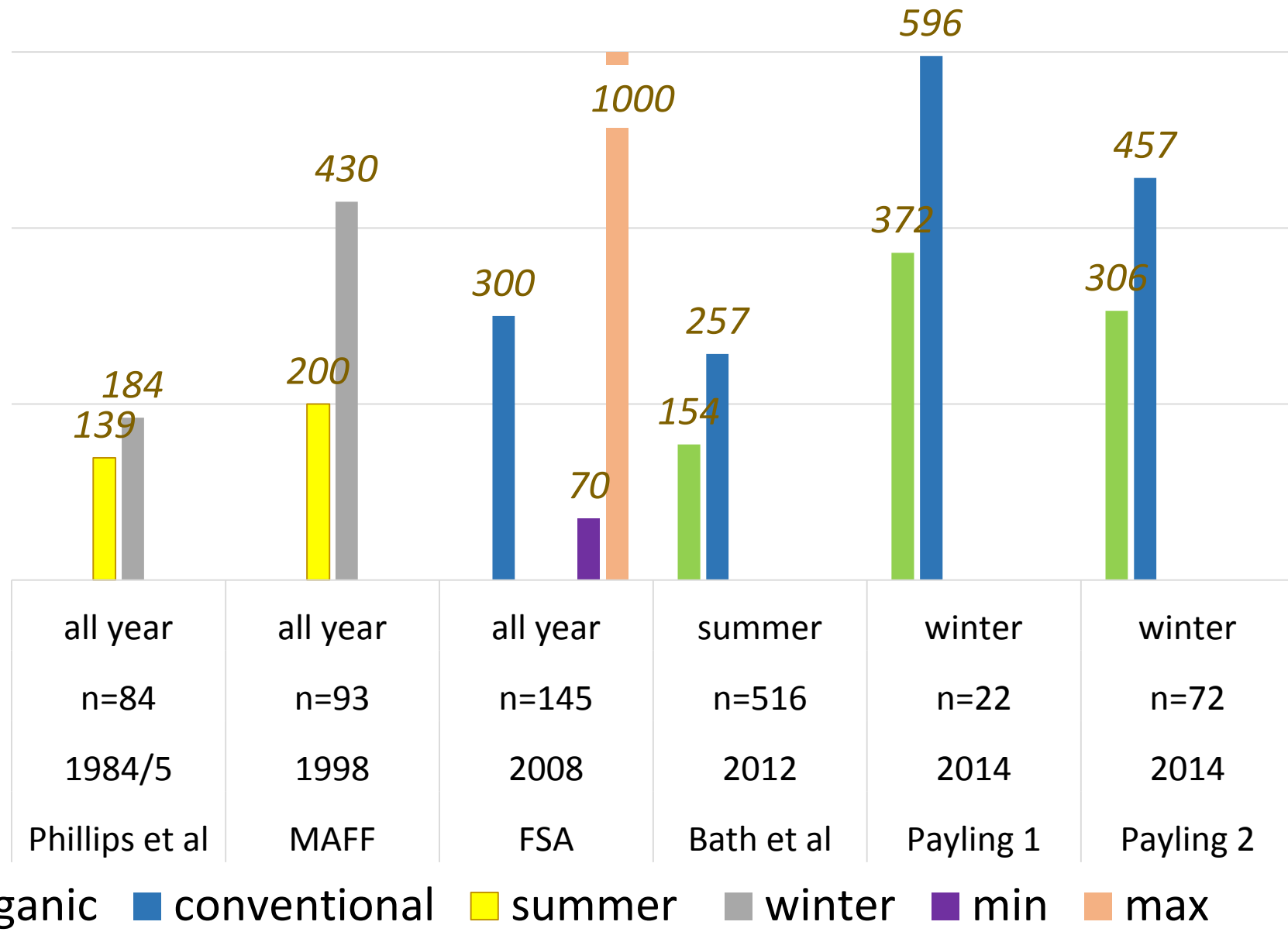


Published studies - iodine in UK milk



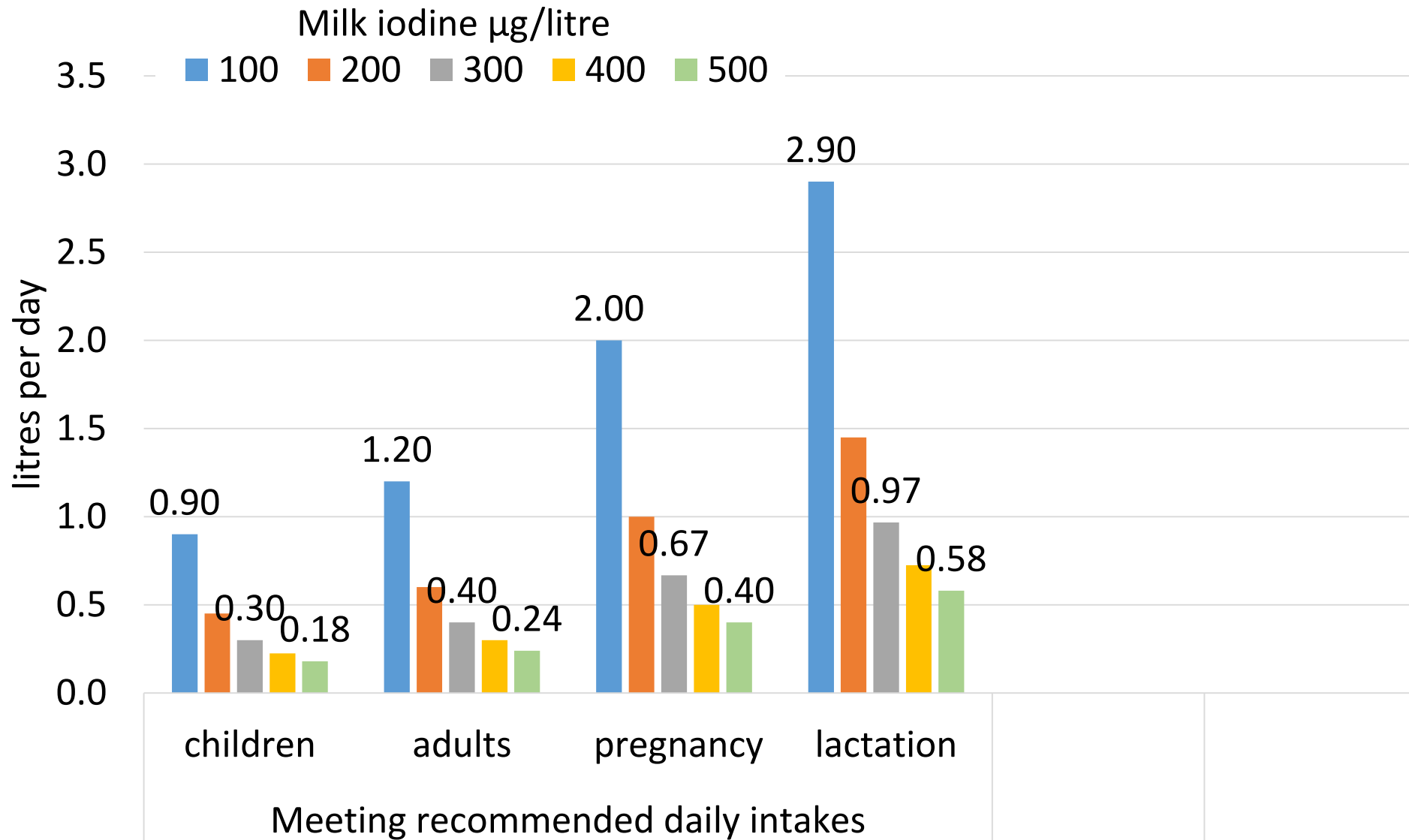
Published studies - iodine in UK milk

µg I per kg milk



■ organic
 ■ conventional
 ■ summer
 ■ winter
 ■ min
 ■ max

Consumption - how much do we need?



Industry reaction...

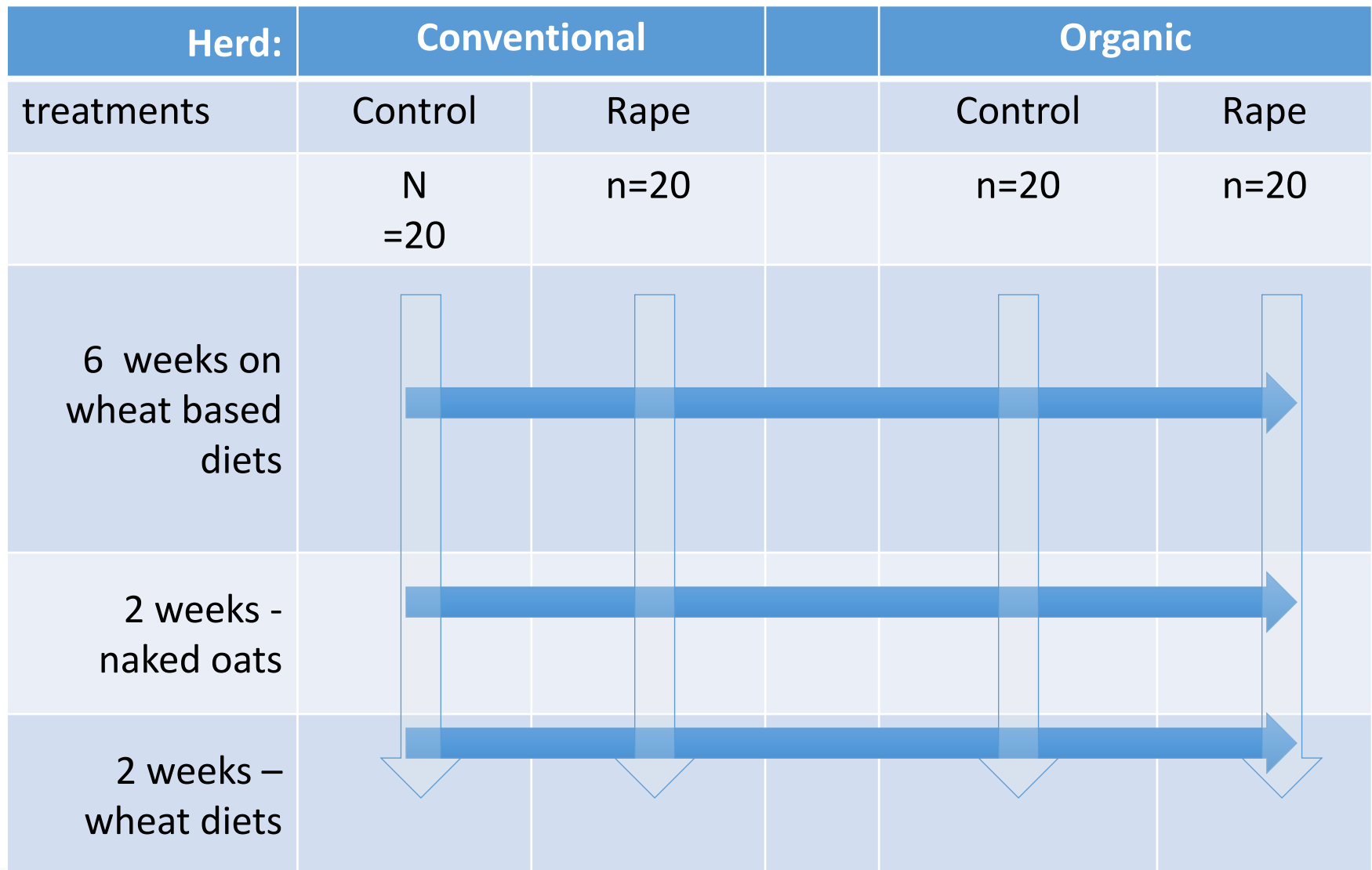
- Concern raised [by press coverage] following publications
- Industry action to reduce risk of iodine deficiency – in cows and consumers
- Greater awareness of need to supplement – fortification of compound feed
- Comprehensive monitoring by OMSCo; on-farm and retail

Dairy *intervention* at Nafferton

- Organic and conventional herds
- Supplementation trial – winter 2012
- Rapeseed & naked oats & impact on milk quality
- Fatty acid, antioxidant and mineral profiles; milk, blood and feeds
- **Rational:** scope for UK grown feeds to improve milk yield and quality under conventional and organic winter diets



Lipid supplementation

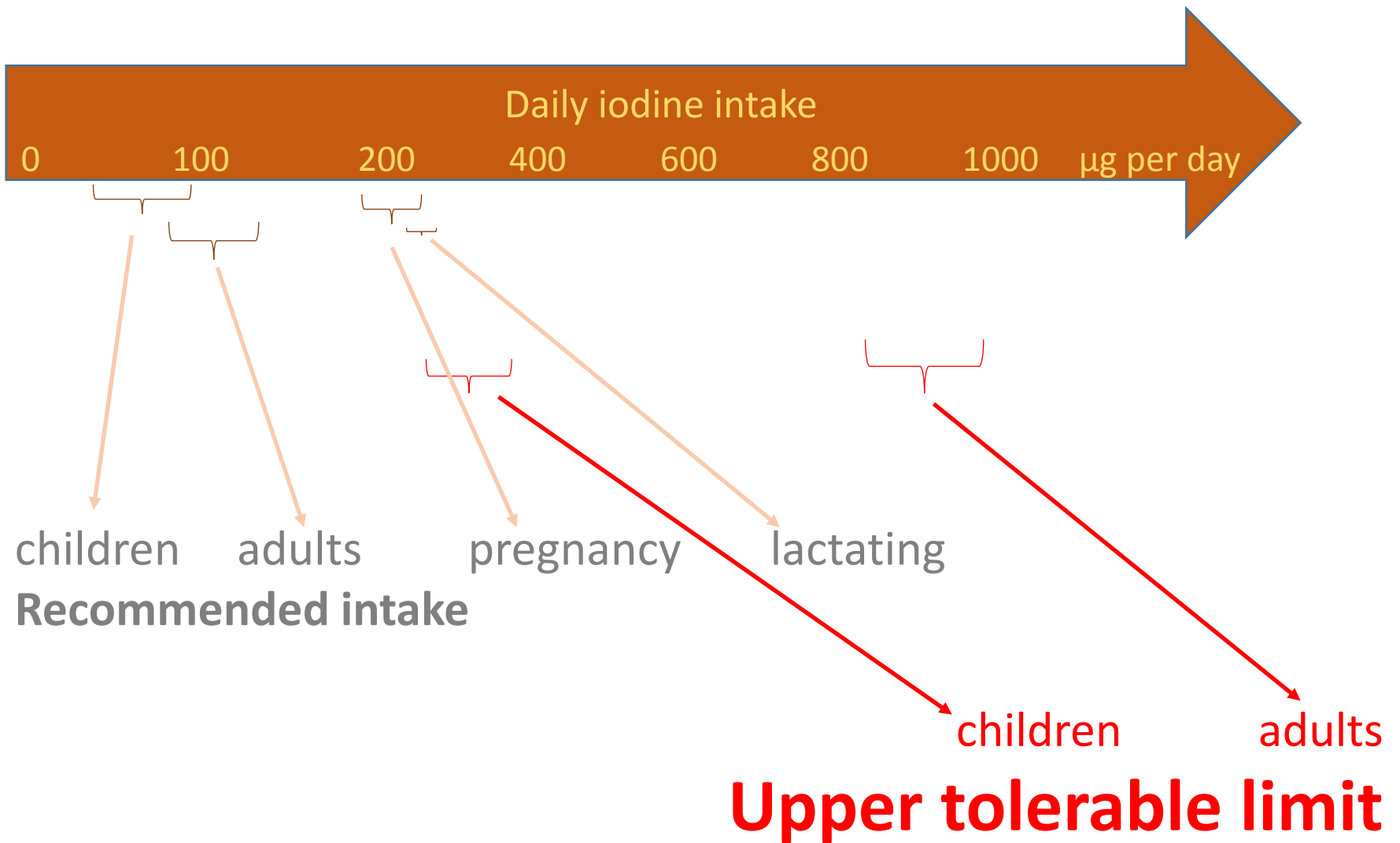


Too much of a good thing?

- Generally concerns about iodine deficiency in some sectors of society - low dairy consumption or elevated needs

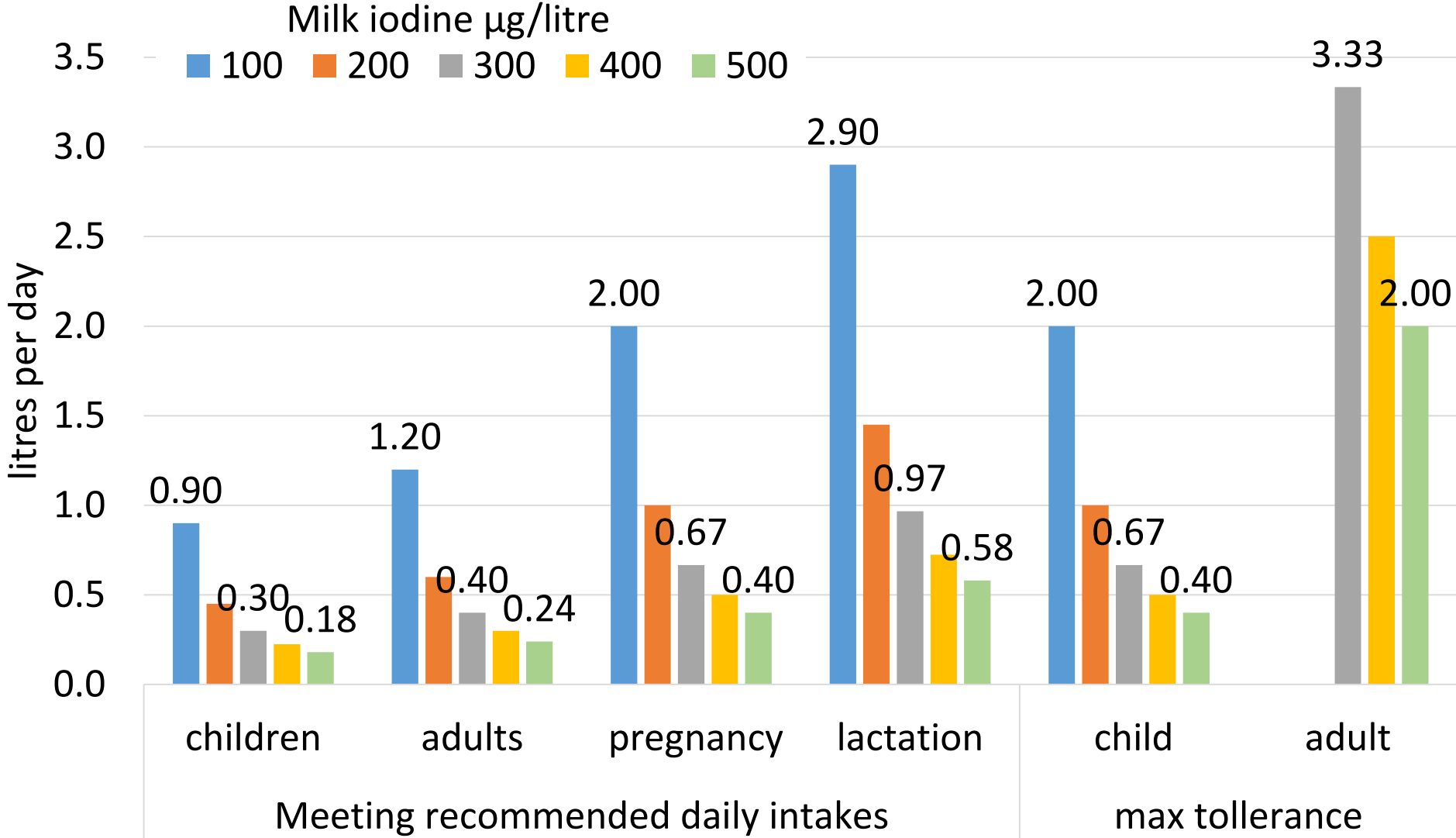
but

- Also concern about hypothyroidism or thyrotoxicosis due to excess iodine
- Phillips et al study 1988 - incidence (15-50/100 000) peaking late winter/spring - more likely if historic deficiency (thyroid function)

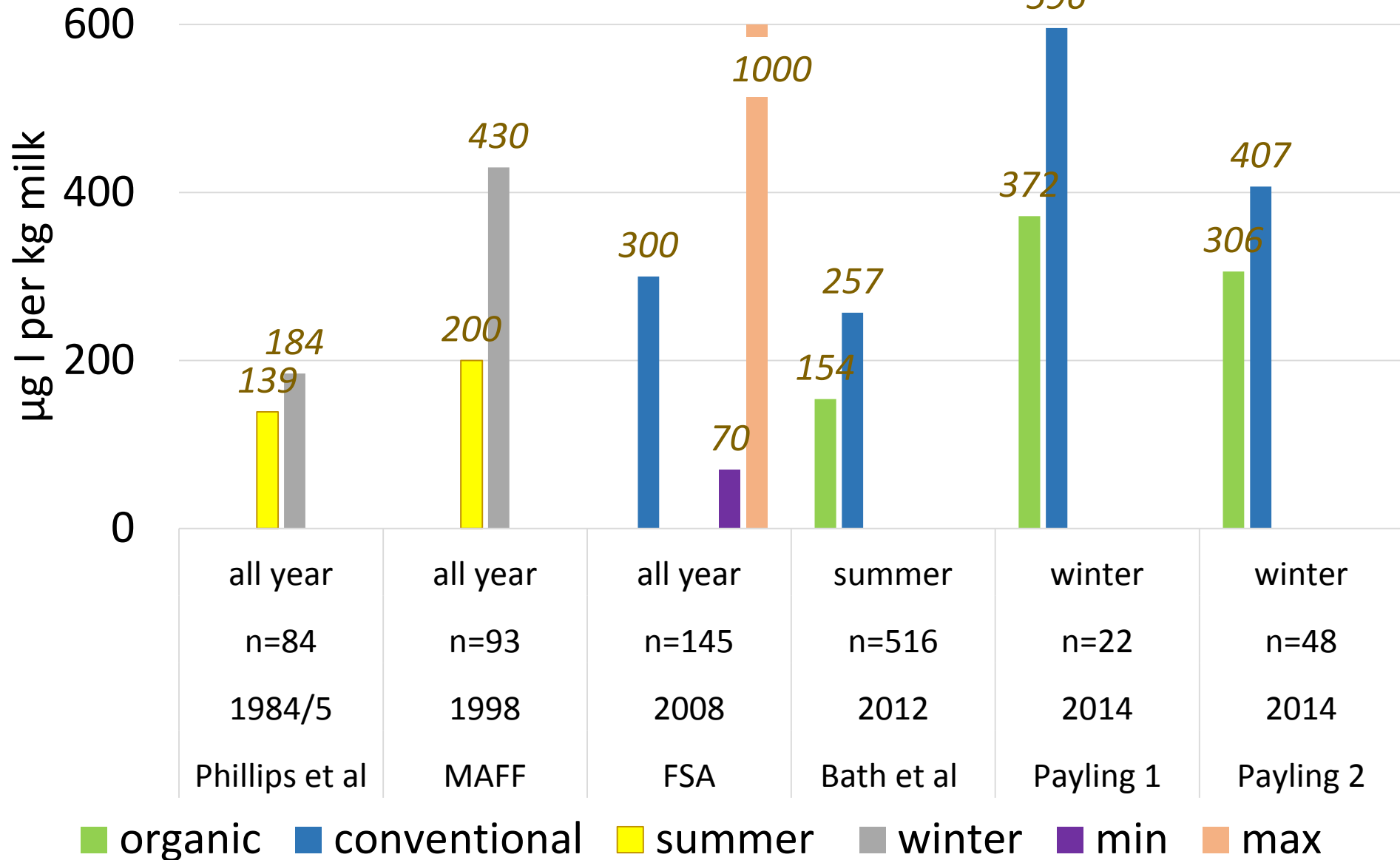


Too much of a good thing?

Consumption - how much do we need /is safe?



Published studies - iodine in UK milk





Thank you for your interest

Appreciation of funding from:

- Duchy Future Farming Programme
- DEFRA sustainable intensification platform
- OMSCo