Bioavailability of iodine in kelp

First evaluation in rodents and next steps

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Iodine in seaweed

- Fish good source: 30-3500 µg/kg ww
- Brown seaweed 100-1000x
- Upper tolerable intake level 600 µg/day for adults (EFSA, 2006)
- Germany and Netherlands requests for data as basis for regulatory levels
- EFSA calls for data
Levels of iodine in brown seaweed

- *Saccharina* and *Laminaria* high
- *Alaria* lower to much lower
- *Ascophyllum* intermediate
- *Fucus* low

- Green and red low
Report potential risks

NSA mandate

Iodine, iAs, Cd

E. coli probably small problem but included in regulations
Insect meal

Potential transfer

Protein
Lipid
Minerals

EPA
I
As, Cd
The challenges

On one side:
- Fast increase interests
- Super-food
  - high levels of nutrients
  - Stimulating factors
- Tasty!

On the other side:
- High levels I, Cd, iAs
- Digestible?
- Bioavailable nutrients?
Rats fed for 2 weeks

Iodine in urine (24h collection)

**Same availability as potassium iodide**
Indigestible fibres special properties

- Tough food: Alginates and other polysaccharides
  - Used as "bio sorbents of heavy metals"
  - Also in digestive system?

pH<2

pH>5

Ion-change?

Also Se, Mg...?
High iodine

Drying, cooking, frying, stock
- evaporation of $I_2$

Slow release?

Can we tolerate higher levels of iodine from kelp?

400-1100 µg/g ww
4000-7000 µg/g dw
Max daily dose 600 µg mg
Max meal size ~1 g ww?

(Combet et al 2014)
Next steps

- Iodine: Rodent trials dose-response Mechanisms and responses
- Iodine: Human intervention studies: Safe levels, confirm (if finances)
- Metabolomics more mechanisms (if ...)
- Cd and iAs: Accumulation or not with increasing doses of kelp?
Can kelp be used in fortification of foods to overcome the low iodine status of the European population?