Priorities for endocrine disruption research

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Theme 1: Antiandrogens in sewage effluents-facts

- Two nationwide surveys during 2003/04 in the UK using the YAS assay have revealed:

- **14% of final effluents (FE) displayed >500μg/L FL eq**
- **35% of FE displayed between 300 and 500μg/L FL eq**
- **Only 16% of FE displayed <50μg/L FL eq**

Source: Environment Agency, UK. 2004. Assessment of the (anti) oestrogenic and (anti)androgenic activities of final effluents from sewage treatment works. R&D Technical Report P6-021/TR, *in press*

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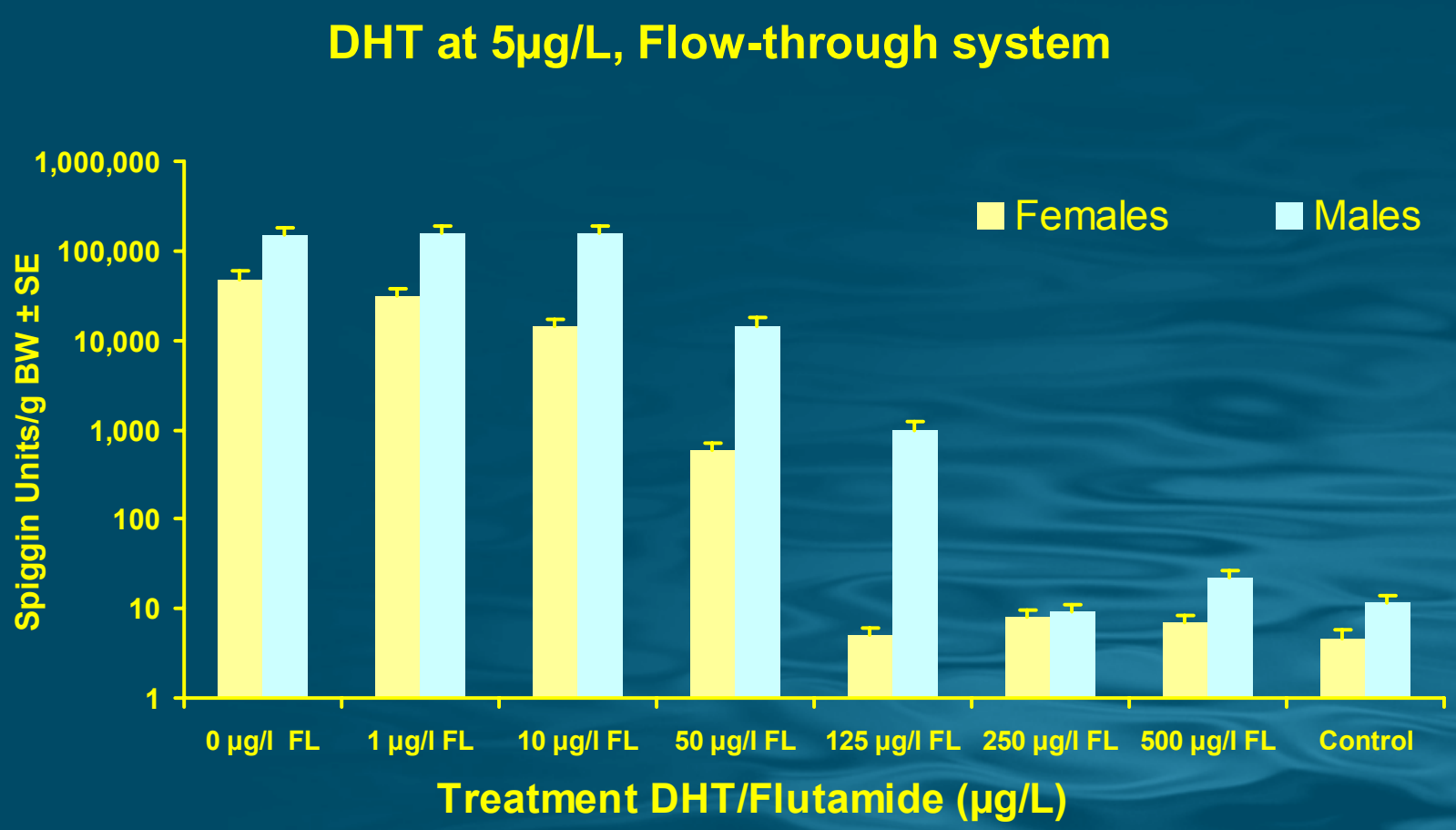
Effects of anti-antiandrogens on fish reproduction 1



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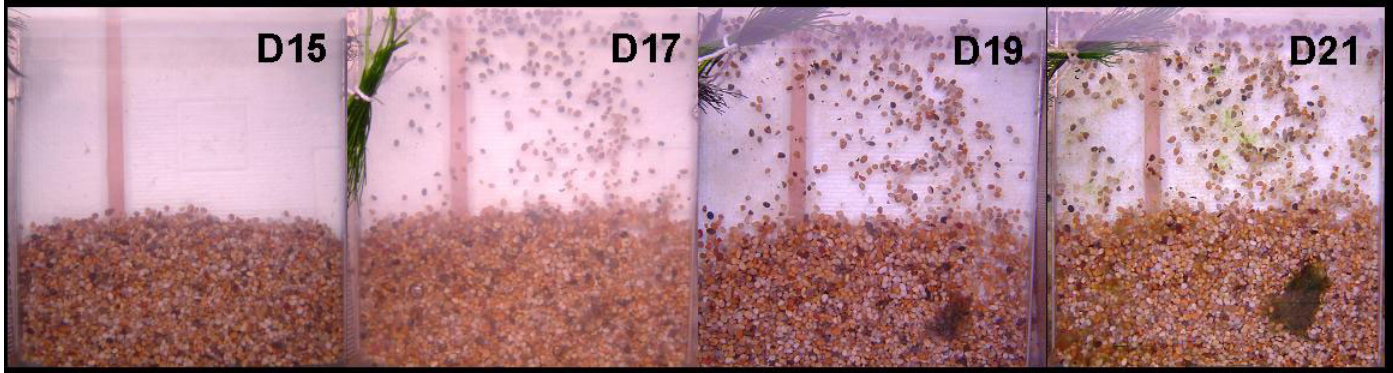
Effects of anti-antiandrogens on fish reproduction 2

Nest building during exposure

Control methanol



Fenitrothion, 200, 50 and 1 μg/L

Fenitrothion and flutamide have similar anti-androgenic activity!

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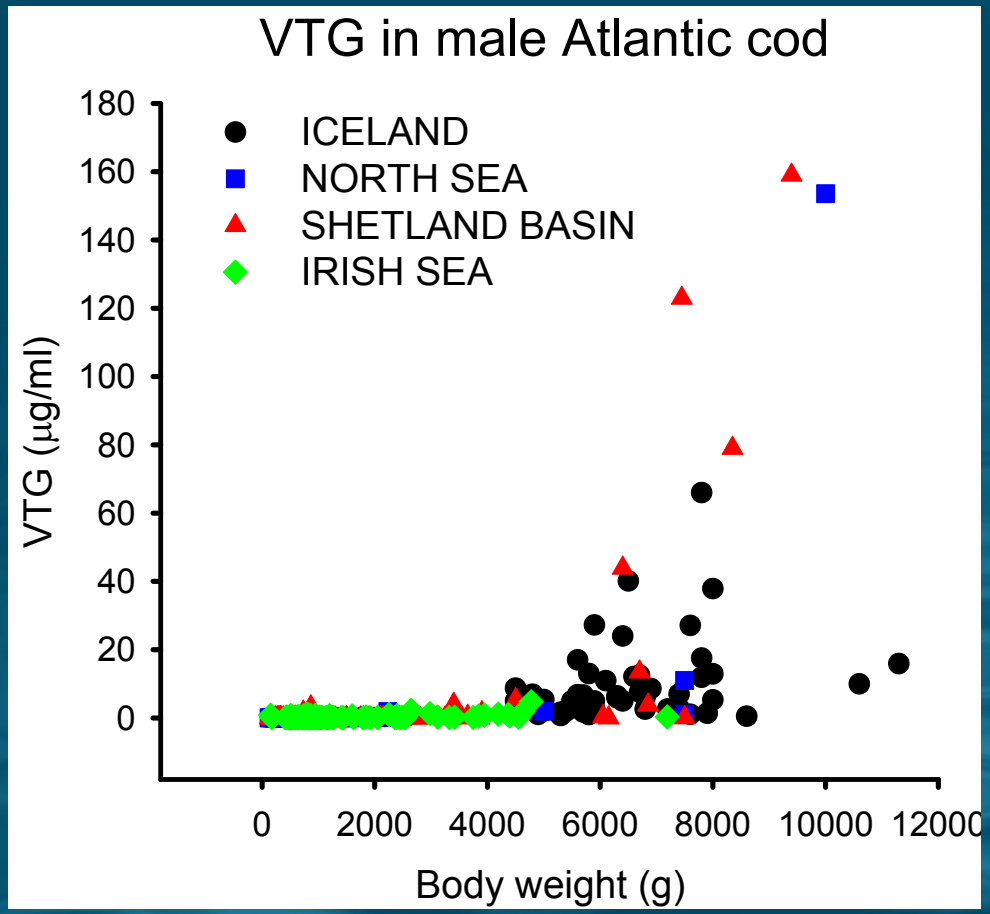
Theme 2: Oestrogens in the open sea

The presence of egg yolk protein vitellogenin (VTG) in blood of male fish is an indicator of endocrine disruption. We shouldn't expect to find it in the open sea.

But we do:



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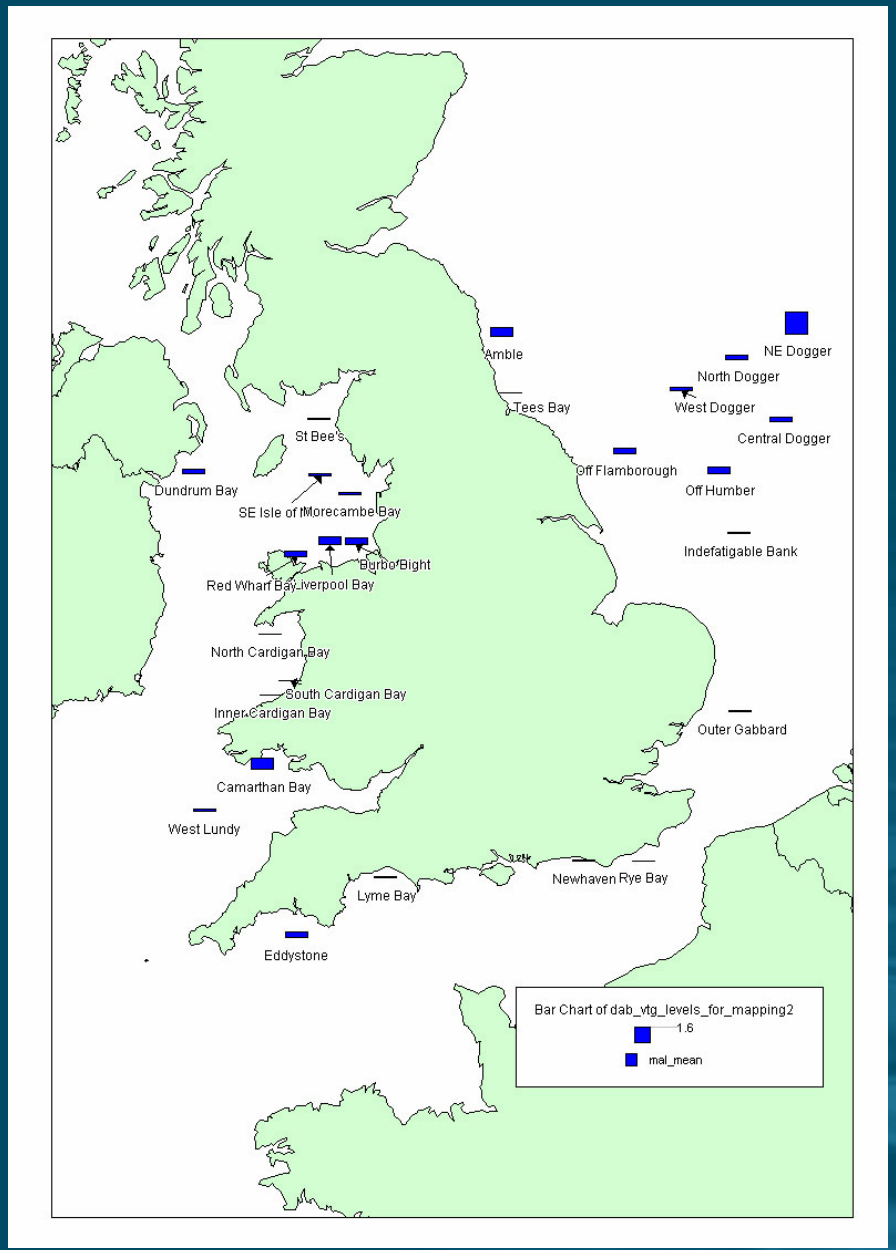
Also, we find it in the dab, a common flatfish:



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The evidence suggests that fish in the North East Atlantic are being exposed through either the water or their diet to persistent organic pollutants with oestrogenic activity.

- Strong +ve relationship to fish size in both cod and dab
- Regional differences in dab
- VTG not correlated with age in either species.
- No evidence that VTG elevations caused by intersex or endogenous 17β-oestradiol.
- No association with time of year/reproductive cycle
- Striking similarities to the problem in male swordfish and tuna in the Mediterranean

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Why is it important?

1. It could adversely affect fish populations
2. It could be a problem for the marine food chain
3. It could be a problem for the European consumer

Can we do anything about it?

Yes, but only if we work to identify the causative agents and route of exposure

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