

TISSUE ACCUMULATION OF ENDOCRINE DISRUPTING COMPOUNDS (EDCs) IN ADULT AND FETAL SHEEP EXPOSED TO SEWAGE SLUDGE-TREATED PASTURES

S M Rhind¹, C E Kyle¹, C Mackie¹, L McDonald¹, M Bellingham², M R Amezaga³, B Mandon-Pepin⁴, C Cotinot⁴, N P Evans², R M Sharpe⁵ and P A Fowler^{3,1}. ¹The Macaulay Land Use Research Institute, Aberdeen, AB15 8QH, UK; ²Institute of comparative Medicine, University of Glasgow Veterinary School, Glasgow G6 1QH, UK; ³Institute of Medical Sciences, University of Aberdeen, Aberdeen, AB25 2ZD, UK; ⁴INRA, France; ⁵Queen's Medical Research Institute, University of Edinburgh, Edinburgh, EH16 4JT, UK • s.rhind@macaulay.ac.uk

1. BACKGROUND

- Exposure to multiple EDCs (via sewage sludge) can perturb sheep fetal reproductive development.
- Tissue concentrations of EDCs in animals exposed to such environmental levels of pollutants are seldom defined.
- Fetal exposure may differ from that of adults.
- Exposure may differ with EDC class.

2. AIMS

- To define rates of liver accumulation of EDCs of four classes in adult and 110 day fetal sheep tissue following exposure to sewage sludge-treated or control pasture at different times.
- To assess the relationships between adult and fetal tissue concentrations.

3. METHODS

Flock 1: Ewes exposed to pastures fertilised with sewage sludge (2.25 tonnes/ha), twice yearly; Treated; T) or with inorganic fertiliser (Control; C).

Flock 2: a) Ewes exposed to sludge-treated pastures throughout life until mating and then to control pastures (TC) OR b) exposed to sludge-treated pastures only from mating (CT).

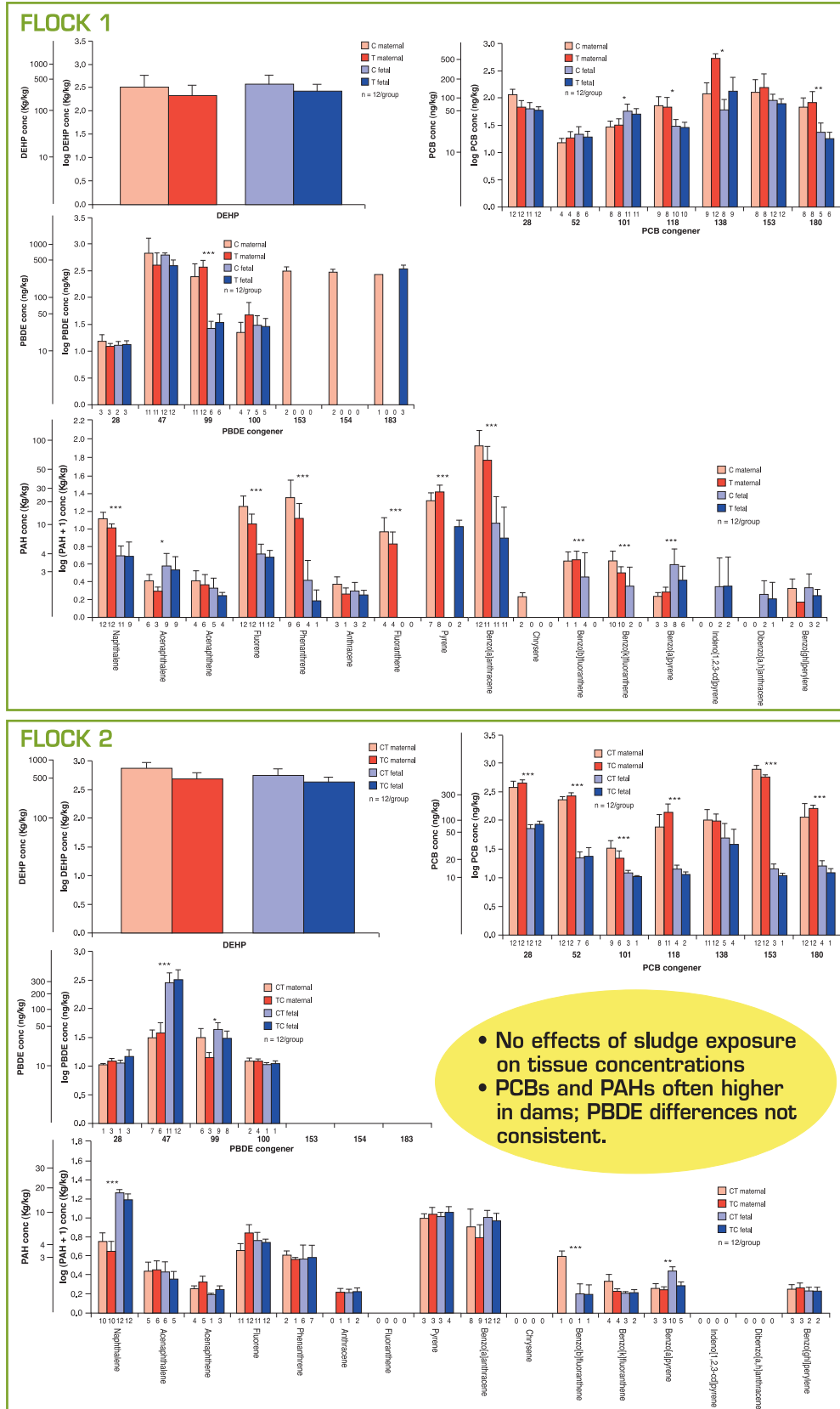
Maternal and fetal tissues analysed for selected EDCs at 110 days gestation.

5. CONCLUSIONS

- Elevated environmental levels of EDCs known to perturb reproductive function did NOT increase maternal or fetal liver concentrations.
- Concentrations of individual EDCs may NOT adequately define the "insult".
- Fetal burden cannot be predicted from adult tissue concentrations.

4. RESULTS

Mean liver concentrations of selected EDCs in dam and fetus. Significance refers to maternal vs fetal. Numbers of individuals with detectable concentrations are given below bars.



• No effects of sludge exposure on tissue concentrations
 • PCBs and PAHs often higher in dams; PBDE differences not consistent.