Desaulniers et al, 2003

Guidelines/Criteria	
Reference:	Desaulniers D, Leingartner K, Musicki B, Yagminas A, Xiao GH, Cole J, Marro L, Charbonneau L, Tsang BK. 2003. Effects of postnatal exposure to mixtures of non-ortho-PCBs, PCDDs, and PCDFs in prepubertal female rats. Toxicol Sci 75(2):468-480.
***In vivo* Study Type**	
Route of Administration	Oral gavage
Species & age of animals	Female Sprague-Dawley rats; PND 1
Study Duration	20 days with dosing on PND 1, 5, 10, 15, 20
Type of Mixture	
Binary	
>2 components	Mixture of 16 components: 3 x PCBs; 6 x PCDD's; 7 x PCDF's.
Similar acting or dissimilar	Similar acting
What Mode of Action was investigated?	Aryl hydrocarbon receptor agonists
Parameters/End points Measured	
Target organs/Critical effects	Organ weights, hepatic P450 enzyme activity (also protein & qpCR measurements) and hormone measurements (LH, TSH, thyroxin & corticosterone)
Pharmacological changes or adverse effects	
Individual Components	
Characterisation of individual compounds	
Name, exact chemical name, CAS no.	PCBs: 3,3',4,4'-TetraCB 3,3',4,4',5-PentaCB 3,3',4,4',5,5'-HexaCB PCDDs: 2,3,7,8-TetraCDD 1,2,3,7,8-PentaCDD 1,2,3,4,7,8-HexaCDD 1,2,3,7,8,9-HexaCDD 1,2,3,4,6,7,8-HeptaCDD OCDD PCDFs: 2,3,7,8-TetraCDF 2,3,4,7,8-PentaCDF 1,2,3,4,7,8-HexaCDF 1,2,3,6,7,8-HexaCDF 2,3,4,6,7,8-HexaCDF 1,2,3,4,6,7,8-HeptaCDF OctaCDF
Were dose responses established for individual components?	No
Were no effect levels established?	No
Were doses below the NO(A)ELs investigated?	Toxic equivalents relative to TCDD were calculated for the various components in the different mixes. At 1x and 10x the TCDD-TEQs were 0.056 & 0.54ng/rat respectively
Mixtures Investigated	
Number of dose levels	Four dose levels investigated for the 16 component mixture. There were also groups with submixtures, but these were only tested at 1000x and so are excluded from this review as an environmentally-relevant dose was not tested.
How does the mixture make-up compare to individual components? (e.g. low dose) equivalents used?)	Each component present at a level equivalent to 1, 10, 100, and 1000 x the estimated amount a newborn is exposed to during the first 24 days of life (milk fat concentrations of each chemical from Caucasian women in south Quebec x newborn milk consumption rate x % milk fat).
No. of technical replicates per exposure condition (*in vitro*)	
No. of animals per dose group (*in vivo*)	10 - 13 animals per treatment group
Observations/Findings	No effects observed for any parameters at 1x and 10 x. At the higher doses effects followed additive pattern. EROD & BROD increased from 100 x. Liver, thymus &spleen rates affected and thyroxine reduced at 1000x.
Overall opinion (e.g. sufficient numbers of groups investigated, group sizes adequate, observations reproducible, low dose levels used investigated)	Sufficient group sizes. Relevant paper to include. No effects on any of the parameters were recorded at 1x and 10x and clear effects observed at the two higher dose levels.