



## Tolerable Intakes of PFOS & PFOA

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<b>Tolerable Intakes of PFOS &amp; PFOA</b>				
		<b>EFSA 2008</b> (foods)	<b>Danish EPA 2015</b> (drinking water, soil, ground water)	<b>EFSA 2018</b> (foods)
<b>PFOS</b>		150 ng/kg/day	30 ng/kg/day	13 ng/kg/ <b>week</b>
	TDI based on:	Subchronic exposure in Cynomolgus monkeys showing changes in lipids and thyroid hormones. NOAEL: 30 µg/kg/day UF: 200	Liver toxicity after chronic exposure of rats BMDL <sub>10</sub> : 33µg/kg/day UF: 41x3x10 (Clearance differences) =33/1230=0.03 µg/kg/day	Serum cholesterol increase in humans; Antibody response at vaccination in children (NOAEL 170µg/kg/day) (plus reduced birth weight in humans) RfD (chronic) =1.8ng/kg/day=13ng/kg/week UF: no
<b>PFOA</b>		1500 ng/kg/day	100 ng/kg/day	6 ng/kg/ <b>week</b>
	TDI based on:	Liver toxicity in rats/mice. BMDL <sub>10</sub> of 300µg/kg/day UF: 200	Liver toxicity after 90 day exposure of rats BMDL <sub>10</sub> : 456µg/kg/day => HED- BMDL <sub>10</sub> : 3 µg/kg/day UF: 3x10 =3/30=0.1 µg/kg/day	Serum cholesterol increase in humans (plus reduced birth weight & increase of liver ALT in humans) RfD (chronic) =0.8ng/kg/day=6ng/kg/week UF: no

The derivation of TDIs for PFOS and PFOA performed by EFSA in 2008 was based on a monkey and a rat study, respectively.

The derivation of TDIs for PFOS and PFOA performed by Danish EPA in 2015 (performed by DHI) was based on liver toxicity observed in rat studies, and the calculations were closely related to the RfD derivation performed by the US-EPA in 2014.

The derivation of TDWs for PFOS and PFOA performed by EFSA in 2018 was based on human epidemiological studies.

The well-known toxicokinetics differences between rodents and humans for PFAS contribute to the discrepancy of the evaluations, but there also seem to be marked toxicodynamic differences.

**The opinion of DTU is in agreement with the recent EFSA evaluation.** We note with satisfaction that human studies now form the basis of the evaluation and that the established TDIs protect against cholesterol increases as well as impaired immune response and decreased birth weight (although the latter endpoint was not included in the evaluation). The TDI set by EFSA for PFOS has been reduced by a factor of ~80 (from 2008 to 2018), whereas the TDI for PFOA has been reduced by a factor of ~1700 and this seems justified. As PFAS are persistent it seems reasonable to base the TDI on a weekly intake. A considerable proportion of the human population exceed these TDIs, especially as humans are exposed to several other PFAS that are expected to have the same mode of action and therefore contribute to a cumulated mixture effect.

Annemarie Vinggaard