Table 10

In this guide

Table 10. Repeated dose toxicity studies for PFCAs - PFNA

*Derived by contractor; ** calculated according to EFSA. (2012); NR – not reported; NA – not applicable.

Substance / CAS no. / purity / reference	Strain & species / sex / no. of animals	Dose (mg/kg bw/day) / vehicle / route of admin / duration / Guideline (GL) study / Good Laboratory Practice (GLP) status	PFAS concentration (µg/mL / µg/g)	Observed effects at LOAEL (controls vs treated groups). Recovery (controls vs treated groups).	Published NOAEL / LOAEL (mg/kg bw/day)	Study comm

PFNA CAS No. 375-95-1 >97%. Fang et al. (2012)	Sprague-Dawley rats, Male 6/dose.	0, 0.2, 1 or 5. Water, Gavage, 14 days, Non-GL study, GLP not stated.	NR	↑ glycogen: data only presented in figures. ↑ MDA: data only presented in figures. ↑ H2O2: data only presented in figures. Recovery not assessed.	Males: 1 / 5	PFNA admini increas levels o glucose hepatic via alte expres genes r glucose metabo suppre hepatic pathwa sugges PFNA m to indu in rat. I exposu caused oxidati which r contrib suppre insulin and the of hepa metabo

PFNA CAS No. 375-95-1 >97%. Hadrup et al. (2016)	Wister rats, Male 10/dose.	0, 0.0125, 0.25 or 5. Corn oil, Gavage, 14 days, Non-GL study, GLP not stated.	At 0.25 mg/kg bw/day Serum: 29.95. At 5 mg/kg bw/day Serum: 602.	Males (mean ± SD): ↓ mRNA of AKR1C1, Ugt 2B15, Cyp2C11, Cyp1A2 and Cyp2B6. Recovery not assessed.	Males: 0.25 / 5	At high concen macros micros pathol liver as decrea and org showed dose is to the a not sur the mR severa are dow as seen Hepato noted w PFAS c Notably these t occur, CYP2B6 CYP2C1 down-r PFNA, w CYP3A2 corresp the hur was up sugges this CY upregu increas elimina multipl metabo confirm broad s specific enzym

Males (mean ± SE):

↑ absolute liver weight (g): 11.73 ± 0.23 vs 13.99 ± 0.33.

↑ relative liver weight (mg/g body weight): 34.14 ± 0.30 vs 42.12 ± 0.58.

↓ TP (g/dL): 6.6 ± 0.0 vs 6.0 ± 0.1.

↓ globulin (g/dL): 2.2 ± 0.0 vs 1.5 ± 0.0.

↑ albumin/globulin ratio: 2.0 ± 0.0 vs 2.9 ± 0.1.

↓ cholesterol (mg/dL): 117 ± 5 vs 86 ± 2.

↓ TGs (mg/dL): 120 ± 9 vs 59 ± 9.

↑ total bile acids (µmol/L): 13.1 ± 2.4 vs 27.6 ± 3.1.

↑ hepatocytic cytoplasmic alterations: 0 vs 10 (minimal).

↑ hepatocyte hypertrophy: 0

PFNA (ammonium salt) CAS No. 4149-60-4 99%. Kennedy Jr (1987)	Crl:CD-1 mice. Male and female. 5/sex/dose.	0, 3, 10, 30, 300 and 3000 ppm in diet equivalent to 0.27, 0.9, 2.7, 9, 27 or 270 ** Diet. 14 days, Non-GL study, GLP not stated.	NR	Males (mean): ↑ absolute liver weight (g): 1.77/2.08 vs 3.01. ↑ relative liver weight (g/100g): 5.4/6.0 vs 8.4. Females (mean): ↑ absolute liver weight (g): 1.37/1.61 vs 2.29. ↑ relative liver weight (g/100g): 5.7/5.7 vs 7.7. Recovery not assessed.	Males: NA / 3*. Females: NA / 3*.	Ammon perfluo led to c mice a concen 300 pp weight the low tested, materia be mor ammon perfluo and the weight terms c require produc change magnit liver w increas