

Appendix K – Estimation of PFAS in Poultry Eggs

Estimation of PFAS in Poultry Eggs

PFAS concentrations in poultry eggs were estimated using soil and groundwater concentrations in each of the residential areas surrounding the base. The approach used to estimate the PFAS concentrations in eggs was developed by AECOM for use in the Army Aviation Centre Oakey (AAO) HHRA (AECOM, 2017) in conjunction with a study completed by Scolexia (2017).

The equations and input parameters used to estimate PFAS concentrations in poultry eggs is presented in Table K1.

Table K1: Equation Used to Estimate PFAS concentrations in poultry eggs

Source		Equation			
AECOM (2017)		$C_{egg} = \frac{TF \times [(C_{soil} \times IR_{soil}) + (C_{water} \times IR_{water})]}{LR \times W_{egg} \times FE}$			
Input Parameters					
Symbol	Unit	Parameter	Input Value		Reference
C_{egg}	mg/kg	Concentration in egg	Calculated		NA
C_{soil}	mg/kg	Concentration in soil	PFOS	0.005	Based on LOR
			PFHxS	0.005	Based on LOR
			PFOA	0.005	Based on LOR
C_{water}	mg/L	Concentration in water	Bagot (typical) - PFOS	0.0063	Refer Report Body Section 8.4 Table 8-8: Source concentrations
			Bagot (typical) - PFHxS	0.0026	
			Bagot (typical) - PFOA	0.00014	
			Bagot (upper) - PFOS	0.0079	
			Bagot (upper) - PFHxS	0.0028	
			Bagot (upper) - PFOA	0.00014	
			The Narrow - PFOS	0.00018	
			The Narrow - PFHxS	0.00013	
			The Narrow - PFOA	0.00001	
			Jingili / Millner - PFOS	0.00003	
			Jingili / Millner - PFOA	0.00001	
FE	Unitless	Edible fraction of egg	0.87		Scolexia (2017)
IR_{soil}	kg/day	Ingestion rate of soil	0.0105		10% of typical feed intake ⁽¹⁾
IR_{water}	L/day	Ingestion rate of water	0.208		Typical water consumption ⁽¹⁾
LR	eggs/day	Laying Rate	0.86		90% of the laying rate for caged hens (Scolexia, 2017)
TF	Unitless	PFAS Transfer Factor	PFOS	1	AECOM (2017)
			PFHxS	0.689	
			PFOA	0.456	
W_{egg}	kg/egg	Egg weight	0.060		Conservative value based on data from Scolexia (2017)

¹ Based on information from Hy-Line International 'Hy-Line Red Book' <http://www.hyline.com/asp/redbook/redbook.aspx>

The estimated concentrations of PFAS in eggs for each residential areas surrounding the base in presented in Table K2.

Table K2: Estimated PFAS concentrations in poultry eggs [mg/kg]

Compound	Bagot (Typical Exposure)	Bagot (Upper Estimate Exposure)	The Narrows	Jingili / Millner
PFOS	0.030	0.038	0.002	0.001
PFHxS	0.009	0.010	0.001	0.001
PFOA	0.001	0.001	0.001	0.001