Transfer: Nahrung in Tiere – Fleisch, Milch,

Radionuklide und biologische HWZ

Radionuklid	Speicherorgan	physikalische Halbwertszeit	biologische Halbwertszeit
Tritium (H 3)	Körperwasser	12,3 a	10 d
Kohlenstoff 14 (C 14)	Fett	5.730 a	40 d (organ. gebunden)
Kalium 40 (K 40)	Muskulatur	$1{,}28 \cdot 10^9$ a	30 d
Strontium 90 (Sr 90)	Knochen	28,6 a	50 a
Jod 131 (J 131)	Schilddrüse	8,02 d	80 d
Cäsium 137 (Cs 137)	Muskulatur	30,2 a	110 d (Männer), 65 d (Frauen)
Radium 226 (Ra 226)	Skelett	1,600 a	im Mittel 5 a (3,9 a trabekulärer, 23 a kortikaler Knochen)
Thorium 232 (Th 232)	Leber/Knochen	$1{,}4 \cdot 10^{10}$	2 a (Leber), 20 a (Knochenoberfläche)
Uran 238 (U 238)	Nieren, Knochen	$4{,}5 \cdot 10^9$	14 a (Knochenoberfläche)
Plutonium 239 (Pu 239)	Leber, Knochen	$2{,}4 \cdot 10^4$	20 a (Leber), 50 a (Knochenoberfläche)
Polonium 210 (Po 210)	Leber, Niere, Milz	138.4 d	100 d (sehr wenige Daten)

Table 4: Parameters from literature and from this study for a two-compartment model for the ^{137}Cs animal feed transfer coefficient from feed to milk. (Data ± SD, if available).

Parameters	Voigt et al., 1989	Fabbri et al., 1994* Intake / Excretion	This study / models 4 free parameter:	3 free parameter
a_1; $t_{1/2}$ [d]	0.8; 1.5	0.67; 1 / 0.76; 1.7	026; 1.19 ($p<0.01$)	0.69±0.05; 1.06±0.28
a_2; $t_{1/2}$ [d]	0.2; 15	0.33; 12.4 / 0.24; 17.3	0.74; 365 ($p>0.8$)	0.31±0.05; 19.5±3.8
fm [d.L^{-1}]	0.0031 ± 0.0005	0.0031 ± 0.0003	0.0071 ± 0.0008	

* Slightly different parameters for intake and excretion reported by Fabbri et al., 1994.

Figure 2: ^{137}Cs activity concentration in milk (fresh weight, [Bq l^{-1}]) on individual alps during the summer 2002. In (a) alps with increasing ^{137}Cs concentration, in (b) alps with constant or moderately decreasing ^{137}Cs concentration.

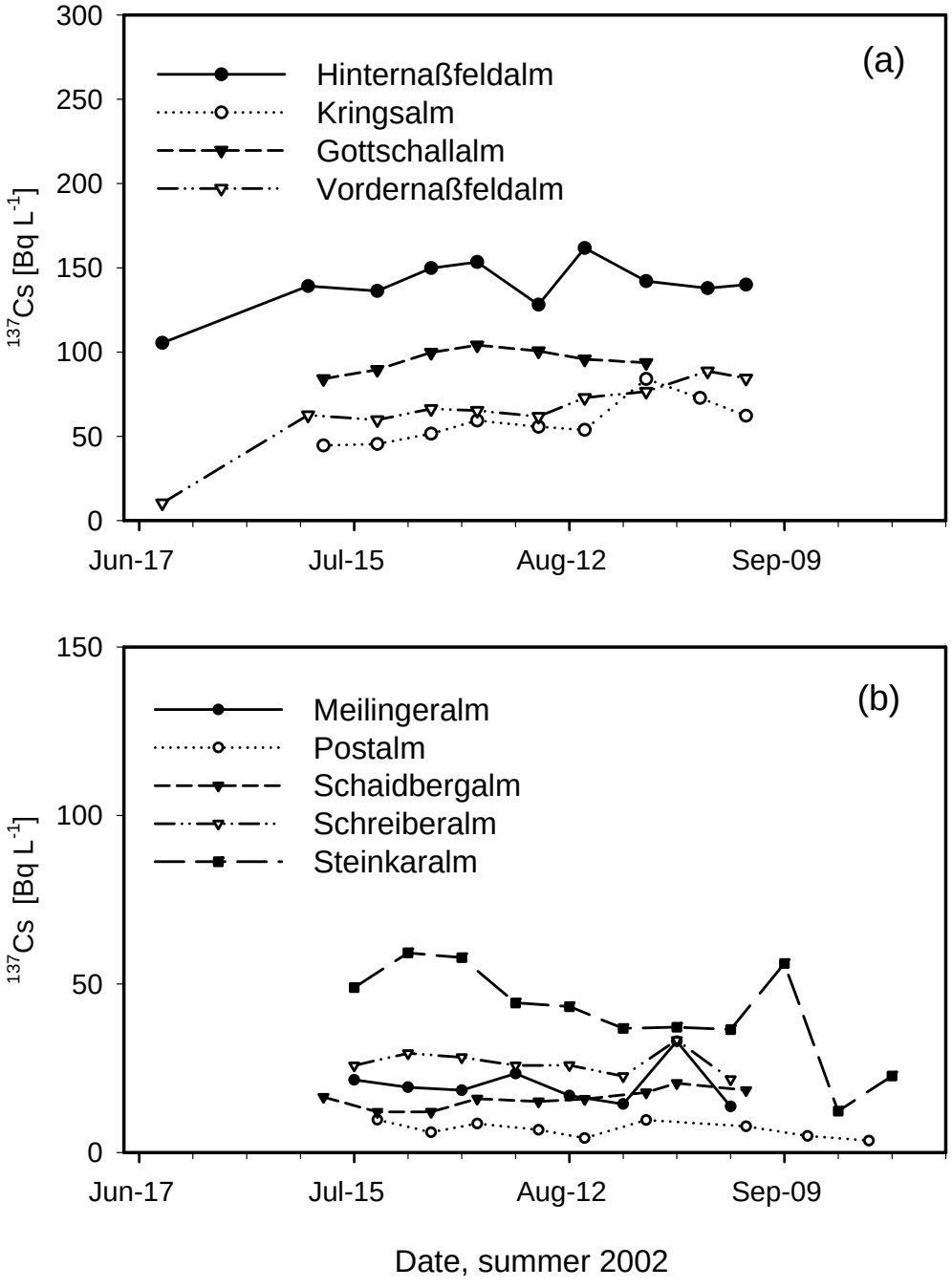

Figure 3 ^{137}Cs concentration [Bq l^{-1}] in milk. Detailed time series (a) of one selected alp (Vorder-Nassfeldalm) during summer 2003, data fits with two-compartment models (b,c,d) and their underlying assumptions. Shaded area in (a) were omitted for fitting.