Carryover of CH_3Hg from feed to sea bass and salmon

Rasmussen, Rie Romme; Håland, Weronica; Larsen, Bodil Katrine; Kotterman, Michiel; Sloth, Jens Jørgen; Marques, António T. ; Granby, Kit

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

Citation (APA):
Rasmussen, R. R., Håland, W., Larsen, B. K., Kotterman, M., Sloth, J. J., Marques, A. T., & Granby, K. (2017). *Carryover of CH_3Hg from feed to sea bass and salmon*. Poster session presented at Seafood Safety, Brussels, Belgium.

Priority environmental contamination in seafood:
safety assessment, impact and public perception

www.ecsafeseafood.eu

Carryover of CH_3Hg from feed to sea bass and salmon

Rasmussen RR[1]; Håland W[1]; Larsen BK[1]; Kotterman M[2]; Sloth JJ[1]; Marques A[3]; Granby K[1]

1) Technical University of Denmark (DTU), 2) Wageningen Marine Research, IJmuiden, The Netherlands, 3) Portuguese Institute for the Sea and Atmosphere (IPMA)

Model. Fish concentration (C_{fish}) as a function of feed uptake, elimination (k_E) and growth dilution (k_G), where uptake depends on feed concentration (C_{feed}), assimilation (α) and feeding rate (F). From fish and feed weight (w), specific growth rate (SRG) and feed conversion rate (FCR) are calculated.

$$\frac{dC_{fish}}{dt} = \alpha \cdot \mathrm{F} \cdot C_{feed} - k_E \cdot C_{fish}$$

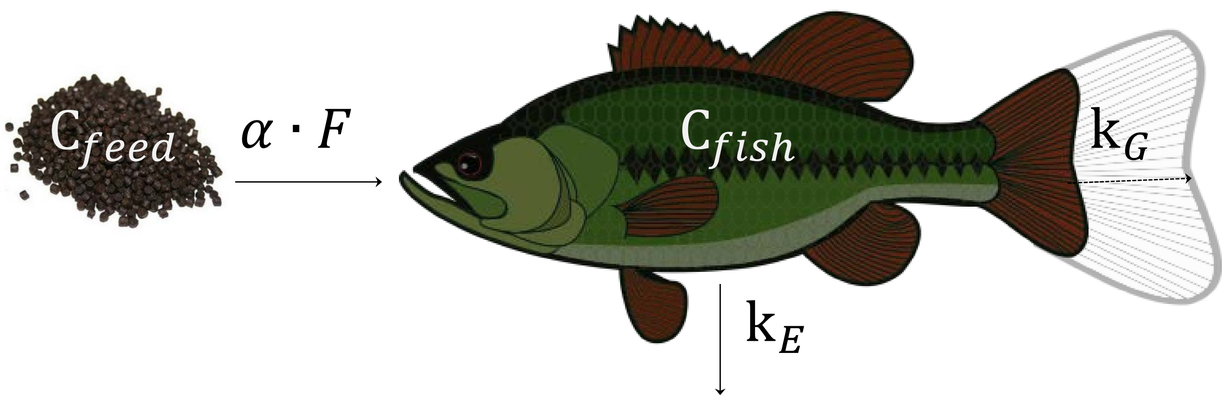
$$\mathrm{FCR} = w_{feed\ consumed} \,/\, \Delta w_{fish\ gained} \quad [1]$$

$$k_G = \mathrm{SGR} = (\ln w_t - \ln w_0)/\, t \quad [2]$$

$$C_{fish\ growt\ corrected}(t) = C_{fish} \cdot (1 + k_G \cdot t) \quad [3]$$

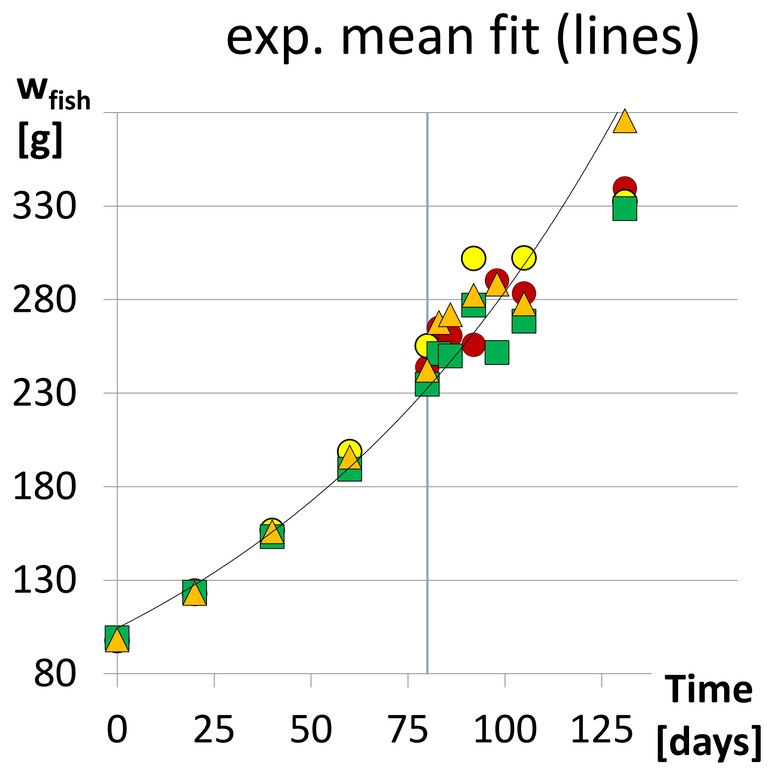
$$\ln\,(C_{fish} - C_{fish,\ control\ diet}) = constant - k_E \cdot t \quad [4]$$

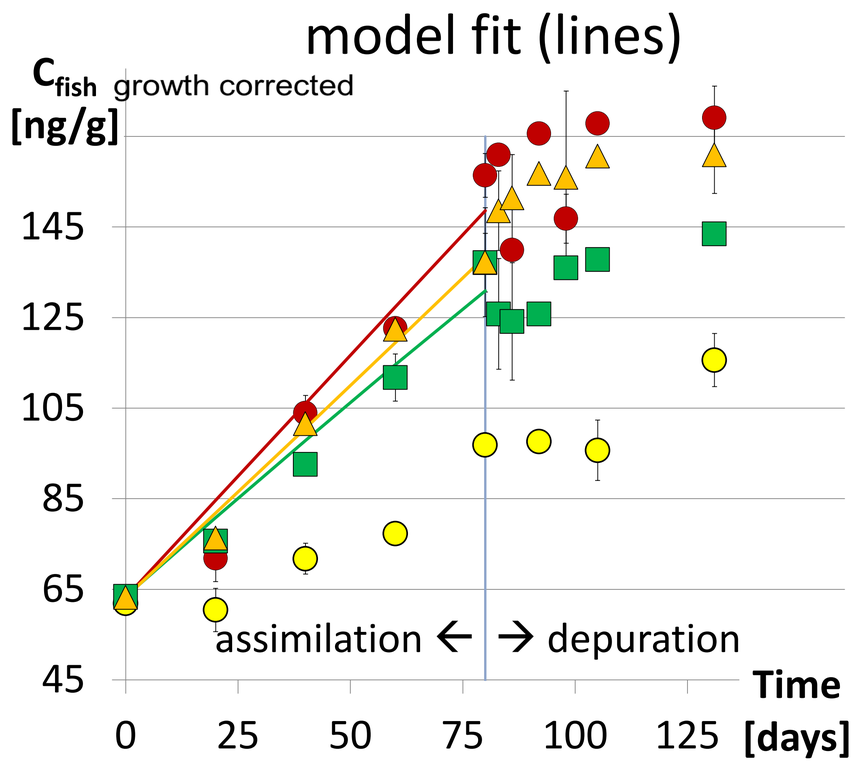
$$C_{fish}(t) = \frac{\alpha \cdot F \cdot C_{feed}}{k_E} \cdot (\,1 - \exp\,(k_E \cdot t)) \quad [5]$$

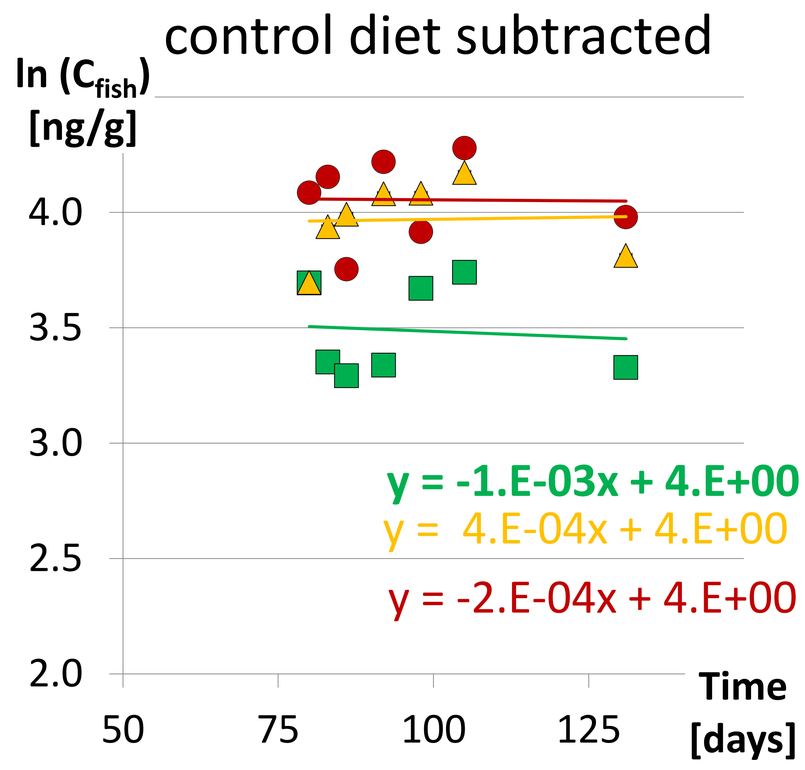


calculate FCR [eq 1] → calculate growth; SGR [eq 2] → calculate $F = \frac{FCR}{t} \frac{\Delta w_{fish\ gain}}{w_{fish\ mean}}$ → correct C_{fish} for growth [3] → estimate k_{el} [eq 4] → estimate α [eq 5]

Sea bass







Conclusion. Toxicokinetics were modeled. Feed with low levels of CH_3Hg (41-75 ng/g) showed assimilation (α) close to 100% and low elimination (k_E). Similar results for all diets.

Results.

	Hg [ng/g]	Salmon		Sea bass	
Diets	C_{feed}	k_E	α	k_E	α
1) Spiked plastic	64	$-4 \cdot 10^{-3}$	0.69	$1 \cdot 10^{-3}$	1.04
2) Spiked oil + clean plastic	74	$1 \cdot 10^{-4}$	0.98	$-4 \cdot 10^{-4}$	0.96
3) Spiked oil	75	$-9 \cdot 10^{-4}$	0.84	$2 \cdot 10^{-4}$	1.08
4) Control	41				

The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement no 311820. This publication reflects the views only of the author, and the European Union cannot be held responsible for any use which may be made of the information contained therein.