Carryover of CH3Hg 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

Citation (APA):
Carryover of CH$_3$Hg 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 ($\alpha$) and feeding rate ($F$). From fish and feed weight ($w$), specific growth rate (SRG) and feed conversion rate (FCR) are calculated.

\[
\frac{dC_{fish}}{dt} = \alpha \cdot F \cdot C_{feed} - k_E \cdot C_{fish}
\]

FCR = $w_{feed\ consumed}$ / $\Delta w_{fish\ gained}$ \hspace{1cm} [1]

$k_G$ = SGR = (ln $w_t$ − ln $w_0$)/ $t$ \hspace{1cm} [2]

$C_{fish\ growth\ corrected}(t) = C_{fish} \cdot (1 + k_G \cdot t)$ \hspace{1cm} [3]

$\ln (C_{fish\−C_{fish,\ control\ diet}}) = constant - k_E \cdot t$ \hspace{1cm} [4]

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

Conclusion. Toxicokinetics were modeled. Feed with low levels of CH$_3$Hg (41-75 ng/g) showed assimilation ($\alpha$) close to 100% and low elimination ($k_E$). Similar results for all diets.

<table>
<thead>
<tr>
<th>Diets</th>
<th>$C_{feed}$</th>
<th>$k_E$</th>
<th>$\alpha$</th>
<th>$k_E$</th>
<th>$\alpha$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Spiked plastic</td>
<td>64</td>
<td>-4.0 x 10^-3</td>
<td>0.69</td>
<td>1.0 x 10^-3</td>
<td>1.04</td>
</tr>
<tr>
<td>2) Spiked oil + clean plastic</td>
<td>74</td>
<td>1.0 x 10^-4</td>
<td>0.98</td>
<td>4.0 x 10^-4</td>
<td>0.96</td>
</tr>
<tr>
<td>3) Spiked oil</td>
<td>75</td>
<td>-9.0 x 10^-4</td>
<td>0.84</td>
<td>2.0 x 10^-4</td>
<td>1.08</td>
</tr>
<tr>
<td>4) Control</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>