Carryover of CH3Hg from feed to sea bass and salmon

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

$k_G$ = SGR = ($\ln w_t - \ln w_0$)/ $t$ [2]

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

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

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

Sea bass Growth exp. mean fit (lines) Fish conc. (Hg, mean, sd, n=2) model fit (lines) Elimination ($k_E$) control diet subtracted

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.

Results. Hg [ng/g] Salmon Sea bass

<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>-4·10^{-3}</td>
<td>0.69</td>
<td>1·10^{-3}</td>
<td>1.04</td>
</tr>
<tr>
<td>2) Spiked oil + clean plastic</td>
<td>74</td>
<td>1·10^{-4}</td>
<td>0.98</td>
<td>-4·10^{-4}</td>
<td>0.96</td>
</tr>
<tr>
<td>3) Spiked oil</td>
<td>75</td>
<td>-9·10^{-4}</td>
<td>0.84</td>
<td>2·10^{-4}</td>
<td>1.08</td>
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<tr>
<td>4) Control</td>
<td>41</td>
<td></td>
<td></td>
<td></td>
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</table>