Errata for
Dynamic Energy Budget theory
for metabolic organisation

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Numbers refer to section, page and line; a negative line number means line from bottom.

1.1.2, \{2\}, 26 The ’,’ at the end of the sentence should be ’.’ (error spotted by Koji Tominaga)

1.1.4, \{6\}, -6 ’size, size’ should be ’size, age’ (error spotted by Nina Marn)

1.2.3, \{11\}, 8 The shape coefficient $\delta_M$ converts shape-specific physical length to structural length: $L = \delta_M L_w$.

1.3.1, \{19\}, 24 *Scophthalmus maximum* must be *Scophthalmus maximus* (error spotted by Jaap van der Meer)

1.3.8, \{22\}, -17 ’effected’ must be ’affected’ (error spotted by Matt Malishev)

2, \{24\}, 16 ’volumetric length’ must be ’structural (volumetric) length’

2.1.4, \{23\}, 24 ’volumetric length’ must be ’structural (volumetric) length’

2.1.4, \{33\}, -4 Legends to Figure 2.6: the units of $X$ and $K$ are cells/ml, while the symbols indicate dimension C-mol per volume. It would have been more consistent to suppress the mentioning of the symbols (error spotted by Jaap van der Meer)

2.1.4, \{34\}, 18 $t_b = \dot{h}^{-1}$ must be $t_b = (N\dot{F})^{-1}$, and 3 lines below must read $\dot{h} = t_c^{-1} = \dot{h}_m N(\dot{h}_m/\dot{F} + N)^{-1}$.

2.3.3, \{41\}, 11 ’a elegant’ must be ’an elegant’ (error spotted by Jaap van der Meer)

2.5.1, \{46\}, -9 ’Heating volume stands for the reduction in volume ..’ must be replaced by ’Heating length stands for the reduction in length ..’ (error spotted by James Maino)

2.6.1, \{52\}, 8 ‘energy density’ must be ‘reserve density’ (2 times)

2.6.1, \{53\}, . Reference numbers in Fig. 2.11 must be replaced: [918] by [919], [431] by [433], [962] by [963]

2.6.2, \{56,57\}, . Reference numbers in Fig. 2.12 must be replaced: [525] by [527], [428] by [430], [738,1244] by [740,1245], [1225] by [1226], [885] by [886]

2.6.2, \{60\}, . Reference numbers in Fig. 2.13 must be replaced: [588] by [590], [986] by [987], [985,1197] by [986,1198]

2.6.2, \{62\}, -11 $U_E^b = f[E_m]L^3_b$ should be replaced by $U_E^b = f[E_m]L^3_b/\{\dot{p}_{Am}\}$ (error spotted by Starrlight Augustine)

2.6.2, \{66\}, 9 Eq (2.49) must read

$$u_H(\tau) = \frac{g^3(1-k)}{3^3k^4} \left(6k\tau - 3k^2\tau(2 + \tau) + k^3\tau^2(3 + \tau) - 6(1 - k)(1 - \exp(-k\tau))\right)$$
2.6.2., {57}, 'maintenance rate constant' constant should be ‘maintenance rate coefficient' (error spotted by Nina Marn)

2.7, {70}, . Reference numbers in Fig. 2.17 must be replaced: [494] by [796], [440] by [442]

2.7.1, {72}, Eq (2.59): \(-H k u_H^p\) must be \(-k u_H^p\)

2.9, {77}, 'energy density' must be ‘reserve density’

3.2.3, {85}, Eq (3.6): ‘i \in \{C, H, O, N\}’ must be ‘* \in \{C, H, O, N\}’ (error spotted by Ana Llandres)

3.4, {93}, -15 Table 3.3: \(\mu_E\) must be \(\mu_E\) in the formula for \(y_{VE}\) (error spotted by Charlotte Récapet and Valentin Verdon)

3.4, {93}, -12 Table 3.3: \(y_{EX}\) must be \(y_{XE}\) in the formula for \(y_{VE}\) (error spotted by Charlotte Récapet and Valentin Verdon)

3.4, {93}, -12 Table 3.3: the units of \(\dot{p}_T\) must be \(J d^{-1} m^{-2}\) (error spotted by Elke Zimmer)

3.7.4, {106}, -9 Eq (3.35): \(\frac{k_{S_1} k_{S_2} j_{S_2}^p}{k_{S_2} + j_{S_2}^p + j_{S_2}^r}\) must be \(\frac{k_{S_1} k_{S_2} j_{S_2}^p}{(k_{S_1} + j_{S_2}^p)(k_{S_2} + j_{S_2}^p + j_{S_2}^r)}\)

3.7.4, {105} Lower-left panel of Figure 3.7: \(j_A^+ = \frac{1}{k_B + j_B + j_{A}}\) must be \(j_A^+ = \frac{1}{k_A + j_A + j_{A}}\)

3.7.4, {107}, 6 Eq (3.38): \(\rho\) must be \(\rho_{S_2}\) (error spotted by Erik Noonburg)

3.7.4, {107}, 6 Eq (3.38): \(w\) must be \(\rho_{S_2}\) (error spotted by Mike Kearney)

3.7.4, {107}, 9 Eq (3.39): \(a\) must be \(A\) in numerator for \(j_{S_2}^+\)

4.1.1, {115}, 19 ‘energy density’ must be ‘reserve density’ (2 times)

4.1.4, {118}, 6 \(e \leq l + l_T\) must be \(e \geq l + l_T\) (error spotted by Elke Zimmer)

4.1.4, {120}, -8 ‘(2.10)’ must be ‘(2.11)’ (error spotted by Nina Marn)

4.1.5, {122}, 11 Eq (4.6): \(j_{EC}\) must be \(\kappa j_{EC}\). Also holds for line 1 (2 times)

4.2.2, {128}, 10 Eq (4.15): \((e - \dot{r}/\dot{k}_E)\) must be \(e(1 - \dot{r}/\dot{k}_E)\), two times (error spotted by Tjalling Jager)

4.2.2, {129}, -7 ‘energy density’ must be ‘reserve density’
4.2.2, \{130\}, 19 Just under Eq (4.22): ‘which’ must be $Y_g$. (error spotted by Jaap van der Meer)

4.2.2, \{131\}. Reference numbers in Fig. 4.11 must be replaced: [1168] by [1169], [212] by [214], [671] by [673], [798] by [800]

4.2.2, \{132\}, 11 In the table for yield coefficients under Droop: $Y_g \frac{g}{f}$ must be $Y_g \frac{g}{f+g}$. (error spotted by Jaap van der Meer)

4.2.3, \{133\}, -16 ‘energy density’ must be ‘reserve density’

4.3, \{144\}, 8 ‘energy density’ must be ‘reserve density’

4.3, \{146\}, -3 Figure 4.19: The values for $M_{CV}/M_V$ in the table must be

<table>
<thead>
<tr>
<th>$M_{CV}/M_V$, mol/mol</th>
<th>200</th>
<th>0.585</th>
<th>0.217</th>
<th>0.198</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M_{CV}/M_V$, mol/mol</td>
<td>400</td>
<td>0.645</td>
<td>0.263</td>
<td>0.092</td>
</tr>
<tr>
<td>$M_{CV}/M_V$, mol/mol</td>
<td>472</td>
<td>0.703</td>
<td>0.297</td>
<td>0.000</td>
</tr>
</tbody>
</table>

(error spotted by Ana Llandres)

4.4, \{147\}, -11 In (4.49) the term $\left(1 - n_{NE} \frac{n_{CX}}{n_{NN}}\right) \eta_V \hat{p}_G$ must be replaced by $\left(1 - n_{VE} \frac{n_{CX}}{n_{NN}}\right) \eta_V \hat{p}_G$ (error spotted by Ana Llandres)

4.4, \{147\}, -3 In (4.50) the term $l_T/g$ must be replaced by $l_T e/g$, and (4.50) only applies if $k = 1$ (error spotted by Jaap van der Meer)

4.8.3, \{164\}, 1 Figure 4.22 should have looked as

4.5.1, \{152\}, -4 In (4.60) the term $\frac{n_{NE}}{n_{NN}}$ of the right term must be replaced by $\frac{n_{CX}}{n_{NN}}$ (error spotted by Ana Llandres)

4.10, \{169\}, 11 In (4.89) the term $(1 - \kappa)f^2$ must be replaced by $(1 - \kappa)f^3$ (error spotted by Dina Lika)
4.11.2, \{176\}, 6 In legends for Fig. 4.28, \( k \) must be \( \delta l \) (error spotted by Starrlight Augustine)

5.2.2, \{195\}, 5 \( j^v_M \leq j^v_M \) must be \( j^v_M \leq j^v_M \) (error spotted by Dina Lika)

5.2.6, \{200\}, -8 ‘Treating ammonia and nitrogen’ must be ‘Treating ammonia and nitrate’ (error spotted by Mike Kearney)

5.2.6, \{201\}, 8 \( j_{sA} = \rho_s y_s E j_{sA} \) must be \( j_{sA} = \rho_s y_E E j_{sA} \) (error spotted by Dina Lika)

5.3.1, \{203\}, 4 In lower-left panel of Fig. 5.8 ‘heart’ must be ‘heart’ (error spotted by Starrlight Augustine)

5.3.3, \{210\}, 11 \( \dot{j}_{s12} \) must be \( \dot{j}_{s12} \) (error spotted by Mike Kearney)

6.4.2, \{231\}, -1 Eq (6.13): \( \frac{M_Q}{M_V} \) must be \( \frac{M_Q}{M_V} \)

7.2.3, \{263\}, 14 Eq (7.45): \( \frac{d}{dt} \theta_{EX} \) must be \( \frac{d}{dt} \theta_X \)

7.2.4, \{264\}, -1 ‘Trost’ must be ‘Troost’ (error spotted by Jaap van der Meer)

7.2.5, \{266\}, -7 \( \dot{X} \) must be \( \dot{X} \) (error spotted by Dina Lika)

7.8.2, \{288\}, 14 Above Eq (7.84): \( L_T \) must be replace by \( L^*_T \) in the expression for \( \dot{r} \) with \( L^*_T = L_T M(V) \) (error spotted by Starrlight Augustine)

7.8.2, \{288\}, 15 Eq (7.84): \( \frac{d}{dt} L = \frac{\dot{r}}{3} \) must be \( \frac{d}{dt} L = \frac{\dot{r}}{3} \)

7.8.2, \{288\}, 16 Under Eq (7.84): \( g \) does not depend on changes in surface area-volume relationships, so \( g^* \) in (7.84) should be replaced by \( g \) (error spotted by Elke Zimmer), see comments.

7.9.2, \{290\}, -21 ‘energy density’ must be ‘reserve density’

8.1.2, \{297\}, 13, \( \dot{\{J_{Xm}\}} / \{\dot{P}_{Am}\} \) should be \( \{\dot{J}_{XAm}\} / \{\dot{P}_{Am}\} \) (error spotted by Nina Marn)

8.2.1, \{300\}, -5 \( \{\dot{P}_{Am}\} \) must be \( \{\dot{P}_{Am}\} \) (error spotted by Jaap van der Meer)

8.2.1, \{300\}, -5 \( [E_{G1}] = [E_{G1}] \) must be \( [E_{G2}] = [E_{G1}] \) (error spotted by Elke Zimmer)

8.2.2, \{302\}, -6 It best to avoid adding C-moles of different types on dimensional grounds and work with weights: \( \theta_V = \frac{W_V}{W_V + W_E} = \frac{w_y M_V}{w_y M_V + w_E M_E} \)

8.2.2, \{302\}, -6 Eq (8.3) \( z^{-3/4} l_T^{\text{ref}} \) must be \( z^{-1} l_T^{\text{ref}} \) (error spotted by James Maino)

8.2.2, \{320\}, 10 Table 8.3 The reference for Tyto must be ‘De Groot, R.S., 1983. Origin, status and ecology of the owls in the Galapagos. Ardea, 71, 167-182’ (error spotted by Carlos Teixeira)
8.2.2, {323}, -3 ‘energy density’ must be ‘reserve density’
8.2.2, {324}, 3 ‘3/4, but 1’ must be ‘1/4, but 1/3’ (error spotted by James Maino)
9.2.1, {350}, -14 and further X_K must be K (error spotted by Jaap van der Meer)
9.2.1, {351}, -11 Eq (9.12) and further: J_{Xm} must be J_{XAm} (error spotted by Jaap van der Meer)
9.2.2, {360}, 9 ‘with body size’ must be ‘with food density’ (error spotted by Clément Aldebert)
9.2.3, {368}, 2 ‘energy density’ must be ‘reserve density’
9.3.1, {375}, -13 ‘and dead producers’ must be ‘and dead consumers (error spotted by Jaap van der Meer)
9.3.1, {375}, -17 ‘where consumers” must be ‘where producers” (error spotted by Jaap van der Meer)
9.4.1, {380}, 13 ‘1 + x_P + x_C’ must be ‘1 + x_P + x_D’ (error spotted by Jaap van der Meer)
9.4.1, {380}, 15 ‘\dot{J}_{ED,A2C} = m_{ED}\dot{J}_{VD,A2C}’ must be ‘\dot{J}_{ED,A2C} = m_{ED}\dot{J}_{VD,A2C}’ (error spotted by Jaap van der Meer)
9.4.1, {380}, -6 ‘\dot{J}_{Ei,P,A1C}’ must be ‘\dot{J}_{Ei,P,A1C}’ (error spotted by Jaap van der Meer)
9.4.1, {381}, 3 ‘1000 for light’ must be ‘4 for light’ (error spotted by Jaap van der Meer)
10.4, {407}, -12 ‘Triuridaceae’ must be ‘Triuridaceae’
notation, {499}, 6 ‘energy density’ must be ‘reserve energy density’(2 times)
notation, {502}, -1 V^{1/3}/L must be L/L_w (error spotted by Tjalling Jager)
These talking gouramis, *Trichopsis vittatus*, come from the same brood and therefore are the same age. They also grew up in the same aquarium. The size difference resulted from competition for a limited amount of food chunks, which amplified tiny initial size differences. This illustrates that age cannot serve as a satisfactory basis for the description of growth and food intake should be included explicitly.

**Dynamic Energy Budget (DEB) theory** is a formal theory for the uptake and use of substrates (food, nutrients, light) by organisms and their use for maintenance, growth, maturation and propagation; it applies to all organisms (microorganisms, animals, plants). The document gives background, explanation and extension for the third edition of the DEB book.