

# BioSIM' Survival Models

## Uniformised Parameters

General Parameters	$k, k_0, k_1, k_2, kk, kk_1, kk_2$
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Temperature	$T \text{ }^{\circ}\text{C}$
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Lower	$T_L \text{ }^{\circ}\text{C}$
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Optimum	$T_o \text{ }^{\circ}\text{C}$
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Upper	$T_H \text{ }^{\circ}\text{C}$
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Temperature scale	$\Delta_T, \Delta_{T_L}, \Delta_{T_H}$
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01• Survival\_01

$$\frac{1}{1 + e^{k_0 + k_1 T + k_2 T^2}}$$

02• Survival\_02

$$\frac{1}{1 + e^{k_0 + k_1 T + k_2 T^{kk}}}$$

03• Survival\_03

$$1 - \frac{1}{1 + k e^{-kk \left( \frac{T - T_o}{\Delta T} \right)^2}}$$

04• Survival\_04

$$k e^{-\left( \frac{T - T_o}{\Delta T} \right)^2}$$

05• Survival\_05

$$k_0 + k_1 e^{-\left( \frac{T - T_o}{\Delta T} \right)^2}$$

06• Survival\_06

$$k_0 + k_1 e^{-kk \frac{\ln\left(\left| \frac{T}{T_o} \right| \right)^2}{\Delta T}}$$

07• Survival\_07

$$k_0 + k_1 T + k_2 T^{kk}$$

08• Survival\_08

$$1 - e^{k_0 + k_1 T + k_2 T^{-kk}}$$

09• Survival\_09

$$\frac{k k_1}{1 + k k_2 e^{k_0 + k_1 T + k_2 T^{kk}}}$$

10• Survival\_10

$$\frac{1}{e^{kk} \left( 1 + e^{-\frac{T - T_L}{\Delta T_L}} \right) \left( 1 + e^{-\frac{T_H - T}{\Delta T_H}} \right)}$$

11• Survival\_11

$$\frac{k}{e^{\left( 1 + e^{-\frac{T - T_0}{\Delta T_L}} \right)} \left( 1 + e^{-\frac{T_0 - T}{\Delta T_H}} \right)}$$

12• Survival\_12

$$\frac{k}{e^{\left( 1 + e^{-\frac{T - T_L}{\Delta T_L}} \right)} \left( 1 + e^{-\frac{T_H - T}{\Delta T_H}} \right)}$$

13• Survival\_13

$$1 - k \left( 1 - e^{-\frac{T - T_L}{\Delta T}} \right) \left( 1 - e^{-\frac{T_H - T}{\Delta T}} \right)$$

14• Survival\_14

$$1 - e^{-k \left( 1 - e^{-\frac{T - T_L}{\Delta T_L}} \right) \left( 1 - e^{-\frac{T_H - T}{\Delta T_H}} \right)}$$

15• Gompertz&Makeham

$$k_0 + k_1 e^{k k_1 T} + k_2 e^{k k_2 T}$$

16• Wang2

$$\frac{1}{e^{-k \left( 1 + e^{-\frac{T - T_0}{\Delta T_L}} \right) \left( 1 + e^{-\frac{T_0 - T}{\Delta T_H}} \right)}}$$