GROWTH & EXPONENTS

Lactobacillus

EXPONENTIAL FUNCTION

differential equation

$$[d / dt]\, N(t) = k\, N(t)$$

solution

$$N(t) = N(0)\, e^{k\, t}$$

yogurt

$$N(t) = 3\, e^{0.693\, t} = 3\, 2^{t}$$

k

$$N(t) = N(0)\, e^{k\, t}$$

$$N(t) = 2\, N(0)$$

$$2 = e^{k\, t}$$

$$\mathrm{Log}_e[2] = \mathrm{Log}_e[e^{k\, t}] = k\, t$$

$$k = \mathrm{Log}_e[2] / t$$

LINEAR TRANSFORMATION

$N(t) = N(0)\, e^{k\,t}$

$\mathrm{Log}_e[N(t)] = \mathrm{Log}_e[N(0)\, e^{k\,t}]$

$\mathrm{Log}_e[N(t)] = \mathrm{Log}_e[N(0)] + \mathrm{Log}_e[e^{k\,t}]$

$\mathrm{Log}_e[N(t)] = \mathrm{Log}_e[N(0)] + k\,t$

{0, 12}
{2, 20}
{4, 33}
{6, 56}
{8, 93}
{10, 155}
{12, 258}
{14, 431}
{16, 720}
{18, 1203}
{20, 1556}
{22, 1804}

Age t [hours] and Individual Number N for *Drosophila* culture over the first day