

The individual growth model

The [individual growth model](#) published by von Bertalanffy in [1934](#) is widely used in biological models and exists in a number of permutations.

In its simplest version the so-called von Bertalanffy growth equation is expressed as a [differential equation](#) of length (L) over time (t):

$$L'(t) = r_B (L_\infty - L(t))$$

when r_B is the von Bertalanffy growth rate and L_∞ is the ultimate length of the individual. This model was proposed earlier by Pütter in 1920 (*Arch. Gesamte Physiol. Mench. Tiere*, **180**: 298-340). The [Dynamic Energy Budget](#) theory provides a mechanistic explanation of this model in the case of [isomorphs](#) that experience a constant food availability. The inverse of the von Bertalanffy growth rate appears to depend linearly on the ultimate length, when different food levels are compared. The intercept relates to the maintenance costs, the slope to the rate at which reserve is mobilized for use by metabolism. The ultimate length equals the maximum length at high food availabilities.^[1]

Bertalanffy, L. von, (1934). *Untersuchungen über die Gesetzlichkeit des Wachstums*. I. Allgemeine Grundlagen der Theorie; mathematische und physiologische Gesetzlichkeiten des Wachstums bei Wassertieren. *Arch. Entwicklungsmech.*, 131:613-652.

Source: http://en.wikipedia.org/wiki/Von_Bertalanffy