Kinetics and Energetics of Growth

In 1999, Prof. F.C. Neidhart was invited to write a “guest commentary” in vol 181 (24) of Journal of Bacteriology. He titled it “Constant obsession with dN/dt”. In this paper, even before to describe “the mathematical elegance and simplicity—but more important, its invitation to explore” of the growth equation, he remarked that “one of life’s inevitable disappointments...comes from expecting others to share the particularities of one’s own sense of awe and wonder”. These words can be fully applied to Prof. van Uden in his relation with yeast kinetics and energetics. He also felt, first, the beauty and scientific relevance of the mathematical description of yeast behaviour, and then the disappointment of verifying that his enthusiasm was shared or understood by only a few of yeast physiologists. One of these few was Anthony Rose, who hosted in the first edition (1971) of “The Yeasts”, a chapter by Prof. van Uden, reviewing his recent models on yeast growth kinetics. Dr Rose wrote later, in his van Uden’s obituary, that the “approach ...to develop mathematical predictions of microbial behaviour...left most yeasts physiologists gasping”. Perhaps the scientific background of the seventies was not a good field to receive fruitfully his models, although he tried hardly to communicate them, publishing in the most read and rigorous microbial journals, as Annual Review of Microbiology. But now, 40 years later, the scientific landscape has changed strongly. The analysis of mathematical models, whose parameters values are the result of thousands of reactions related in a systemic way, is at the core of Systems Biology. It is hoped that this new background will give new opportunities to appreciate the actual relevance of Prof. van Uden models and ideas about yeast kinetics and energetics.

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