Biotin Consumption in Baker's Yeast Saccharomyces cerevisiae Strains Auxotrophic for Biotin

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Brewer’s yeast Saccharomyces cerevisiae strains S288C, W303 and BY4741 auxotropic for biotin were studied for their growth kinetics and biotin consumption parameters, as well as the number of molecules of biotin present in the cell at any given time using absorption (turbidity) measurements. It was found that biotin is accumulated in the cell; the biomass yield per mole of biotin in S. cerevisiae increases with an increase in the concentration of biotin in the medium; the number of molecules of biotin present in the cell at any given time was found to be (5000 +-1000)molecules for strain S288C, (8500 +-1500)molecules for W303 and (6500 +-1000)molecules for BY4741, which for strain S288C overlaps with the number of molecules of biotin synthase in the cell at any given time and is 2500 in number higher for W303. The relative error of the method developed is 18%. The data is in accord with biotin synthase being a suicidal enzyme.