



Next: [Project Goals](#) **Up:** [Modelling Yeast-Sugar Interactions](#) **Previous:** [Modelling Yeast-Sugar Interactions](#)

Introduction

Population studies of yeast form one of the cornerstones of quantitative ecology, and introduce concepts like intrinsic growth rate, carrying capacity, and logistic growth into the lexicon of population dynamics. Experiments using yeast and parameterizing mathematical models go back to Gause and *The Struggle for Existence*. In this lab students design and carry out experiments to validate models for the metabolism of sugar by baker's yeast, *Saccharomyces cerevisiae*, and subsequent population growth. Lab teams design experimental protocols, construct and parametrize models and validate/falsify their results. In our experience this whole process takes at least two-three weeks of class/lab time.

Yeast, used in making bread and alcohol fermentation, are single-celled fungi. In liquid media yeast disperse evenly and form new yeast buds when they have stockpiled adequate resources. Engergy is harvested from sugars, especially glucose, through glycolysis, in which the six-carbon sugar, glucose, is broken down into two three-carbon pyruvate molecules. Depending on presence of oxygen in their environment, yeast can either oxidize pyruvate completely to carbon dioxide (aerobic) or undergo fermentation to produce ethanol (anaerobic).

Subsections

- [Project Goals](#)
- [Design of the Experiment](#)
- [Materials Needed](#)

James Powell
2000-07-31