

THE WAGNER FREE INSTITUTE OF SCIENCE

Winter 2019

BOTANY SERIES

Fermentation: An Introduction

Professor Karen Snetselaar

This course will be held at the **Pennsylvania Horticultural Society**, 100 N. 20th Street (20th and Arch Streets), Philadelphia, PA.

Dates: 6 Tuesdays, January 22 - February 26, 2019

Time: Lectures are held from 6:30 to 7:30 PM

This course requires pre-registration. To sign up, click on the link on the Wagner's course schedule webpage or call 215-763-6529 x23.

Course Description

This course will explore the basic biology behind one of the oldest ways that humans process and preserve foods and beverages: fermentation. It will include a look at food products from all over the world to get a sense of the diverse and widespread nature of fermentation. The focus of the course will be on common themes: the microbes used and how they are managed to produce safe fermented foods. This is not a practical course, with recipes and hands-on experiences. The focus is to provide background information of interest to those who enjoy consuming fermented foods and drinks as well as to those who might wish to develop skills in producing their own.

Course Schedule

1. Tuesday, January 22, 2019

Introduction to the major players in fermentation: the microbes. Focus will be on the lactic acid-producing bacteria that are involved in many fermentation processes but relevant fungal fermenters will be discussed as well.

2. Tuesday, January 29, 2019

Fermenting vegetables: sauerkraut, pickles, and a myriad of other examples. These are easy ferments because they mainly rely on microbes already in the vegetables, but what happens in the fermentations may be very complex.

3. Tuesday, February 5, 2019

Fermentation of milk and other dairy products. Nowadays most of these ferments involve known bacterial strains added as starter cultures. However, it's easy to imagine that the first humans to obtain milk from animals discovered its ability to ferment very quickly.

4. Tuesday, February 12, 2019

Fermentation in production of bread and grains.

5. Tuesday, February 19, 2019

Wine and vinegar fermentation.

6. Tuesday, February 26, 2019

Miso, shoyu and related fermented foods that rely mainly on koji, a filamentous fungus. Time permitting, we'll talk briefly about a products like coffee, cocoa beans, tea, and vanilla, which undergo aging process that are sometimes considered to be "fermentations."

Tuesday, March 5, 2019 – make-up class (if needed)

Recommended Readings

The Art of Fermentation by Sandor Ellix Katz (Chelsea Green Publishing Co., 2012) is recommended as a readable introduction. It has lots of practical tips on fermentation but few actual recipes.

Microbiology and Technology of Fermented Foods by Robert W. Hutkins (Wiley-Blackwell, 2006) is an advanced college-level textbook that focuses more on commercial fermentation processes and on the biochemistry of fermentation.

About the Professor

Dr. Karen Snetselaar is Professor of Biology at Saint Joseph's University. She has been a member of the faculty of the Wagner Free Institute of Science since 2000. Her research focuses on fungi and plant disease. She is also interested in urban ecology and in promoting public understanding of science, especially science education outreach into K-12 schools. She leads the Wagner's partnership with Saint Joseph's University, GeoKids LINKS, which brings intensive science learning into North Philadelphia schools.
