

FOOD SCIENCE & TECHNOLOGY

Functional Properties of Food Carbohydrates

FST 7641

Spring 2018

Instructor: Yael Vodovotz

Office: 227 Parker Food Science and Tech. Bldg - 2015 Fyffe Court

Phone: 247-7696

Email: vodovotz.1@OSU.edu

Office Hours: After class and by appointment.

Credit hrs: 2

Contact hrs: 4 lecture hrs/week, 7 week course.

Class times: Tu/Th 11:30am-1:20PM

References:

R. Wrolstad. Food Carbohydrate Chemistry, 2012. Wiley-Blackwell Press

A-C Eliasson, Carbohydrates in Food, Second Edition, CRC Press

Cui, S.W. Food Carbohydrates, Chemistry, Physical Properties and Applications, 2005. CRC Press.

Course Objectives:

Students completing this course should be able to:

- Understand the functional properties of food carbohydrates especially carbohydrate polymers.
- Understand the interaction of other food components with carbohydrates.
- Chose an appropriate carbohydrate for a specific food application.
- Problem solve current issues in carbohydrate application

Assignment: Students will be required to write a paper and deliver a presentation. **Details:** Each student will choose a food product and discuss the role of the carbohydrates in the product. *Paper:* 12pt, double spaced, 5p +title page. *Presentation:* a 12 minute, PowerPoint based presentation discussing the carbohydrate role in the food product. Comments from others on the presentation should be reflected in final paper.

Lecture Outline:

1. Introduction: importance and functional properties of carbohydrates in food systems
2. Sugars
 - a. Browning Reaction
 - b. Non-nutritive sweeteners
3. Starch
 - a. Source and Structure
 - b. Effect of Water
 - c. Effect of Temperature
 - d. Interaction with Sugars
 - e. Interaction with Proteins
 - f. Interaction with Lipids
 - g. Extrusion
4. Gums
 - a. Source and structure
 - b. Physical properties
 - c. Effect of water
 - d. Effect of temperature
 - e. Gels
5. Pectins
 - a. Properties and uses
 - b. Physical properties
 - c. Interaction with water
 - d. Interaction with sugar
6. Cellulose and its Derivatives
 - a. Microcrystalline Cellulose
 - b. Carboxymethyl Cellulose
7. Nutritional applications

Grading Criteria

There will be 2 exams prior to the final exam. These will be encompassing information obtained in class and reading material. Additionally there will be a paper (5 pages) describing the carbohydrates role in the product as well as a 12 min Powerpoint presentation.

Exam 1:	100 points
Exam 2:	100 points
Paper:	50 points
Presentation:	50 points
Total	300 points

Grading Scale:

93 - 100	A
90 - 92.9	A-
87 - 89.9	B+
83 - 86.9	B
80 - 82.9	B-
77 - 79.9	C+
73 - 76.9	C
70 - 72.9	C-
67 - 69.9	D+
60 - 66.9	D
< 60	E

Academic Misconduct:

No form of academic misconduct will be tolerated. Academic honesty requires that each student complete all assignments and related work on an independent basis. All suspected cases will be handled according to OSU procedures via the Committee on Academic Misconduct. The term "academic misconduct" includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct (http://studentaffairs.osu.edu/info_for_students/csc.asp)

Disability Services: The University strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability (including mental health, chronic or temporary medical conditions), please let me know immediately so that we can privately discuss options. You are also welcome to register with Student Life Disability Services to establish reasonable accommodations. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: slds@osu.edu; 614-292-3307; slds.osu.edu; 098 Baker Hall, 113 W. 12th Avenue.