

FDSC 6033 SYLLABUS
Food Biochemistry
TuTh 3:30-4:50, FDSC D-2

General Description

FDSC 6033 Food Biochemistry (SP, Even years). Biochemical characteristics, functions, regulation and impact of components in raw and processed foods of plant origin with focus on applications affecting food quality. Lecture/discussion 3 hours per week. Prerequisite: CHEM 3813. Instructors: Professors Buescher, Howard, Proctor, Morawicki and Devareddy, Department of Food Science.

Course Topics

General Characteristics of Harvested Crops

- Anatomical, compositional features
- Post-harvest deterioration of quality- Post harvest losses

Regulation of Metabolism to Preserve Quality

- Respiration features affecting quality
- Metabolism affected by temperature
- Role of ethylene
- Influence of modified/controlled atmospheres
- Stress metabolites
- Effect of processing on metabolism

Biochemistry of Texture

- Structural components responsible for texture
- Cell wall-middle lamella ultra-structure
- Degradation and de-methoxylation of pectic substances
- Types and modifications of cross-linkages
- Regulation of texture in fresh and processed products

Oxidation-Reduction Reaction Systems

- Active oxygen species
- Formation of active oxygen-oxidases, irradiation, chemical oxidants
- Effect of oxidation on quality characteristics
- Types and reactions of antioxidants
- Regulation of browning reactions

Natural Colors- Sources, Functions, Stability, Derivatives

- Chlorophylls, Carotenoids
- Flavonoids, Betalaines
- Curcuminoids

Biogenesis and Characteristics of Flavors

- Types of flavor volatiles
- Formation of pyrazines
- Sulfur-containing volatiles
- Volatiles derived from fatty acids
- Shikimic acid pathway derived flavors
- Volatile terpenoid biogenesis
- Pungent substances- capsaicins, allicin, phenylpropanoids
- Regulation of flavor biogenesis

Nutritional Biochemistry Aspects of Selected Food Substances

Optional: Natural Toxins-Examples, Sources, Stability, and Eradication

- Mycotoxins, Cyanogens, Allergens

Primary Reference Sources

Materials used for lectures, visuals and handouts are updated every time this course is presented to include current principles and applications. Students will be provided appropriate references and given reading assignments of publications in scientific journals. Primary sources of references materials will be from Journal of Food Science, Food Technology, Journal of Food Biochemistry, Journal of Agriculture and Food Chemistry.

Grades

Grades will be determined from the total points scored on exams, quizzes and reports with 100-90%, A; 89-80%, B; 79-70%, C; 69-60%, D.

Item	No.	Points
Exams @ 100 points	2	200
Quizzes @ 25 point	4	100
Reports @ 50 points	3	150
Other Assignments	tba	100
	Total:	550

Students with special needs are requested to contact Professor Buescher at the beginning of the semester. The university inclement weather policy will apply.