

CARBOHYDRATES IN FOODS (3) - 16:400:504

Instructor

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Learning Goals

Provide the students with a balance of theory and practical application knowledge of carbohydrates used in foods.

Topics to be covered

- Simple Sugars - Classification/Structures/Nomenclature
- Ring Forms, Glycosides
- CHO Reactions I (Carbonyl group)
- CHO Reactions II (Hydroxyl groups)
- CHO Reactions III, including Hydrolysis of Starch
- Dehydration/Browning Reactions
- Oligosaccharides I & II
- Determination of Polysaccharide Structure
- Colloidal Properties of Macromolecules
- PS Classification, Structure, Function, Hydration
- PS Solutions/Gels(Rheology/Texture) I &II
- Neutral PSs - Starch I & II
- Neutral PSs - Cellulosics, except for CMC
- Neutral PSs - Galactomannans & Chitin
- Charged PSs - Xanthan Gum
- CMC, Pectins
- Gum Arabic, Tragacanth
- Agar, Carrageenan
- Alginates
- Gellan gum
- General Review

Expected outcomes

Upon successful completion of this course the students will have learned:

- How to understand the properties and functions of carbohydrates in relation to their specific molecular structural differences and similarities
- How to work with carbohydrates, especially polysaccharides, to achieve desired results and solve food stabilization problems
- Which hydrocolloids are best suited for each functional need in food systems (e.g., for suspension, as processing and packaging aids, to form gels in various systems, etc.)
- How to use carbohydrates as valuable tools for product development (e.g., to affect texture, shelf life, appearance and even flavor perception)
- Where to obtain specific technical information needed for product development, help with technical problems and questions, etc.
- About many resources available to assist them with technical issues.
- How to distinguish between “sales hype” and technical reality in company literature.

Assessment

- Diagnostic quiz – compare answers from 1st class and last class
- Numerous, unannounced quizzes (5 – 7 min duration)
- Three major exams
- Final exam as group projects – identifying an unknown hydrocolloid, using techniques learned during the course. Preparing both written reports and PowerPoint presentations on one or more commercial food products (assigned by instructor) which contain their “unknown” hydrocolloid. Oral presentations are presented during final class period to the entire class by each group (usually 3 – 4 students, for 10 – 15 minutes), explaining why each hydrocolloid is used in each food product and suggesting ways the product might be improved technically and/or economically.
- Class participation