

Additives and ingredients in the food industry (IVth Year of study, VIIth Semester)

Credit value (ECTS) 3

Course category

Domain (Optional)

Course holder:

Assoc. Prof. PhD Viorel-Cezar FLORISTEAN

Discipline objectives (course and practical works)

The main aim of the course and practical works is to provide basic knowledge about additives and ingredients used in food processing. The course and practical are focused on chemical and physical nature of these ingredients, functions and effects on quality and safety of foods and the legal aspects of their approval and utilization.

After the completion of the course students will:

- know the regulatory status of any food additive/ingredient that may be used in food processing in European Union;
- be able to explain the necessity of food additives and ingredients in food;
- be capable to evaluate the implication of misuse of these substances on quality and safety of food processing; correctly identify an additive and an ingredient in a food product and to justify their usage;
- be able to find an efficient and safer alternative additive/ingredient for a specific group of food products;
- be familiar with the main methods used for evaluating the safety of food additives/ingredients.

Contents (syllabus)

| Course (chapters/subchapters) |
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| Introduction and overview of the subject: Food additives/ingredients usage - benefits and risks. Regulation concerning food additives and other categories of ingredients approval and usage in European Union. |
| Food additives: Usage, general characterization and classification of food additives. Major groups of food additives: Food colorants; Food preservatives; Food Antioxidants; Food emulsifiers; Food stabilizers and gums; Food sweeteners; |
| Other classes of food additives: flavor enhancers, acidity regulators, buffer agents, sequestrants, humectants, anti-caking agents, foaming and anti-foaming agents, glazing agents, bulking agents, firming agents, raising agents Propellant and packaging gases and flour treatments agents. |
| Food flavorings: Food Flavor; Flavorings: history of usage, general characterization of a food flavors, classification; Condiments; Herbs; Volatile oils; Oleoresins; Aromatic extracts. |

Processing aids: Antifoam agents; Boiler water additives; Clarifying agents; Filtration aids; Flocculating agents; Ion exchange resins; Contact freezing/cooling agents; Lubricants, anti-sticking agents, moulding aids; Micro-organism control agents; Wetting agents; Enzyme immobilization agents and supports; Solvents, extraction and processing; Washing and Peeling agents; Other processing aids.

Food Enzymes: Specificity of enzymes action, Factors affecting enzymes actions. Enzymes and biotechnology; Artificial enzymes; Enzymes uses in the food industry: enzymes as processing aids, enzymes as analytical tools, enzymes as additives. Main groups of enzymes used in food industry: proteases, lipases, carbohydrases, oxydoreductases, transferases and isomerases.

Fortification agents: Justification, role in food, legislative aspects. Major fortification ingredients: Minerals; Vitamins; Fatty acids and Amino-acids. Probiotics and prebiotics in foods.

Practical works

Presentation of different classes of food additives/ingredients;
Characterization of some food additives/ingredients by specific tests;
Identification of some food additives/ingredients in food by wet chemical methods of analysis;
Identification of the main problems of labeling of food additives and some specific food ingredients.

Final knowledge evaluation

Bibliography

1. Banu C., Stoica A., Bărăscu E., Buțu N., Resmeriță D., Vizireanu C., Lungu C., Iordan M., (2010) Aplicații ale aditivilor și ingredientelor în industria alimentară, Editura ASAB, București.
2. Branen A. L., Davidson P. M., Salminen S. (2002) Food Additives 2nd ed. Marcel Dekker, Inc. New York, USA.
3. Carmen Socaciu (2008) Food colorants: chemical and functional properties. CRC Press, USA.
4. Floristean V. (2014) Aditivi alimentari. Editura „Ion Ionescu de la Brad” Iași, ISBN 978-973-147-150-1.
5. Joint FAO/WHO Expert Committee on Food Additives (2011) Combined Compendium of Food Additive Specifications - Analytical methods, test procedures and laboratory solutions used by and referenced in the food additive specifications. <http://www.fao.org/food/food-safety-quality/scientific-advice/jecfa/jecfa-additives/en/>.
6. Multon J.L. (1992) Additifs et auxiliaires de fabrication dans les industries agro-alimentaires. Tech&Doc – Lavoisier, Paris
7. Orănescu E. (2008) Aditivi alimentari necesitate și risc. Editura Agir, București.
8. Smith J. Hong-Shum L. (2011) Food Additives Data Book 2nd ed., Wiley Blackwell Inc., USA.
9. **** Regulation (EC) No. 1331/2008 of the European Parliament and of the Council establishing a common authorisation procedure for food additives, food enzymes and food flavourings. Official Journal of the European Union L354, 1-6.

10. **** Regulation (EC) No 1332/2008 of The European Parliament and of the Council - on food enzymes and amending Council Directive 83/417/EEC, Council Regulation (EC) No 1493/1999, Directive 2000/13/EC, Council Directive 2001/112/EC and Regulation (EC) No 258/97. Official Journal of the European Union L 354, 7-16.
11. **** Regulation (EC) No 1333/2008 of the European Parliament and of the Council - on food additives L354, 16-33.
12. **** Regulation (EC) No 1334/2008 of the European Parliament and of the Council - on flavourings and certain food ingredients with flavouring properties for use in and on foods and amending Council Regulation (EEC) No 1601/91, Regulations (EC) No 2232/96 and (EC) No 110/2008 and Directive 2000/13/EC. Official Journal of the European Union L 354, 34-50.

Evaluation

| Evaluation form | Evaluation Methods | Percentage of the final grade |
|--|--------------------------------------|--------------------------------------|
| Colloquium | Written examination | 60% |
| Appreciation of the activity during the semester | Oral assessment during the semester. | 40% |

Contact

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