

# Biochemical Laboratory

## FOOD ENGINEERING FACULTY

### HISTORY AND OBJECTIVES

Pertaining to the field of food products biochemistry, our research laboratory (BCL) has been running in the Food Faculty Engineering of Suceava University since 2005.

Aiming to study food plants bio-components, in order to obtain protective or/and fortified foods, on the one hand, and to turn to good account some species (varieties, hybrids etc.) for producing bioethanol, the main objectives of the biochemical research laboratory are:

- **Research regarding the content in proteins, fats, sugars, vitamins and dietary fibres of some cereal and legume species cultivated within Suceava area;**
- **The capitalization of some plant species (varieties, hybrids etc.) for producing bioethanol**

### MAIN RESEARCH THEMES

- *The comparative study of dynamic content of sugars, proteins and vitamins during germination of cereal caryopses*

Inside of this research theme we have studied the dynamic of starch content and of the  $\alpha$ -amylase activity during germination of maize caryopses coming from various maize local varieties.

The germination is a physiological and biochemical process representing the start of a new life cycle for plants. Under proper environmental conditions (temperature, humidity, pH etc.) some substances (sugars, fats, proteins), stored within seed reserve tissues, are transformed under the influence of various enzymes, leading finally to the genesis of the coming vegetal organism. The study of these compounds and of the enzymes involved in their changes can offer useful indications, regarding some seed and coming plant characteristics.

As a result of the biochemical tests conducted on maize caryopses from various maize local varieties, our research team could establish a direct relationship between germination percentage and the caryopses starch mobilization degree, during germination process.

- *Research on increasing efficiency of cereal polysaccharides hydrolysis process under the action of enzymatic preparations*

The use of cereals with a great amount of starch and cellulose provides a sugars base for many bio-products. One of the research themes of our biochemistry laboratory is focused on this line, having in view the cereal polysaccharides hydrolysis efficiency increasing under the action of some enzymatic preparations.

We have conducted the hydrolysis of polysaccharides from wheat grain varieties (with low panification capacity), cultivated on Suceava area, using standard enzymatic preparations from varied sources (bacteria, fungi), as combinations of liquid enzymatic preparations. The hydrolysis of polysaccharides has shown an increasing of glucose obtaining efficiency at certain doses of enzymatic preparation combinations. Even if there were no great differences between using of double combinations (starch hydrolytic enzymes) and triple combinations (starch and cellulolytic

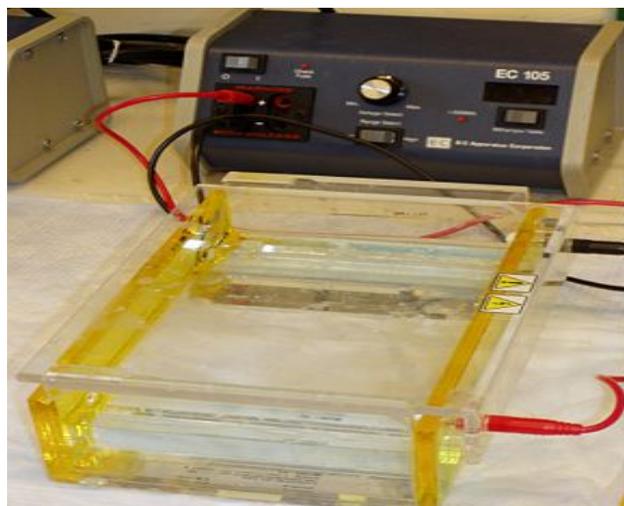
enzymes), however it has evidenced, in the last case, a certain increase of fermentable sugars biomass, which could be taken into account under large scale production conditions.

A part of our research team activity has been presented at some symposiums, with national or international participation, such as:

*New trends in food safety and technologies* - Timișoara, 2007;

*Biotechnologies - Present and perspectives* - Suceava, 2007.

## MAIN RESEARCH EQUIPMENT



Electrophoresis device



Kjeldahl system

### **Permanent staff:**

#### Head of the research team:

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#### Members :

Lecturer Ph.D. chem. Ana LEAHU

Assistant eng. Iuliana CIOARBA

Assistant lecturer Alice ROȘU

**Scientific production 2005-2007:** 8 publications, 2 books

#### **Main collaborations :**

Faculty of Sylviculture-Suceava University;

Gene Bank of Suceava;

“Al.I.Cuza” University of Iasi

**<http://www.fia.usv.ro/laboratoare>**