

Faculty of Food Engineering,  
Ștefan cel Mare University of Suceava,  
Romania

# ABSTRACTS

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## **SECTIONS**

- 1. Biotechnologies in Food Industry**
- 2. Applied Engineering Sciences**
- 3. Food Products Quality and Safety**
- 4. Equipment for Food Industry**

## DETERMINING THE FORCE OF OPENING OF PAPERBOARD FOLDING BOXES

Nadij Arabadjieva, Vilhelm Hadzhiyski, Stefan Stefanov

University of Food Technologies „Maritza“ 26  
4002 Plovdiv, Bulgaria

**Abstract.** *Opening of folding cartons packaging machines often creates problems. They are caused by the different nature and origin of reasons. The publication systematizes factors affecting the opening of the cartons. An important element in the disclosure of reasons is necessary for the determination of the case open force. Proposed a model describing the behavior of a cardboard box in her opening. Using the designed experimental rig is defined the opening force of folding boxes made of cardboard packaging with different characteristics. Experiments were conducted and evaluated the influence of geometrical parameters on the force of opening the cartons. The results of experimental work allow us to define in advance the necessary features for setting up a system of clamps erector of packing equipment.*

**Key words:** *force of opening, folding boxes, cardboard*

## **TEMPORAL CHANGES OF CORROSION LOSSES AND CORROSION RATES IN WATER PIPES**

**Vanda DUBOVÁ<sup>1</sup>, Marek SOKÁČ<sup>2</sup>**

<sup>1</sup>Department of Sanitary and Environmental Engineering, Faculty of Civil Engineering, Slovak University of Technology in Bratislava, Radlinského 11, 813 68 Bratislava, Slovak Republic,

[vanda.dubova@stuba.sk](mailto:vanda.dubova@stuba.sk)

<sup>2</sup>Department of Sanitary and Environmental Engineering, Faculty of Civil Engineering, Slovak University of Technology in Bratislava, Radlinského 11, 813 68 Bratislava, Slovak Republic,

[marek.sokac@stuba.sk](mailto:marek.sokac@stuba.sk)

**Abstract.** *Water distribution systems are often constructed of metal tubes, which in addition to its good properties, especially mechanical, has also tendency to corrosion. Increased activity of corrosion processes significantly affect not only the time- life of the pipe, its failure rate and reliability, but also changes hydraulic conditions of water supply system and may result in poor water quality. Price increase of the water caused a reduction of water consumption and the extension of the travel time of the water in distribution system. This also influences the interaction of the transported water and pipe material. For the reasons, stated above, we observed the corrosive effect of the water from water source Pernek on the pipe with the short- and long- term corrosion tests. Tests are based on measurements of the weight loss difference of the test sample after 30 and 60-day exposure to flowing water. Since short time (30-60 day) test does not always give an accurate picture of the interaction between water and pipe, we extend the test up to two years. During these long-term tests we have observed not only the corrosion losses and the corrosion speed, but also the formation of the corrosion layer and its thickness. Corrosion losses between 30 and 60 day were almost in linear course, but during longer tests corrosion losses speed decreases and the average corrosion rate for 2-year test reached only about 39% of the corrosion rate determined from short term tests.*

**Key words:** *corrosion of water pipes, corrosion rate, corrosion losses, corrosion layer*

## PHASE TRANSFER CATALYSIS FOR GREEN CHEMISTRY

Ye.Torosyan<sup>1</sup>, A.Avetisyan<sup>1</sup>, G.Torosyan<sup>2</sup>

<sup>1</sup>European regional educational academy, Yerevan, Armenia

<sup>2</sup>Faculty of chemical technology and environmental engineering, State engineering university of  
Armenia, [gagiktorosyan@seua.am](mailto:gagiktorosyan@seua.am)

**Abstract.** *The problem of “Green Chemistry” taking as example phase transfer catalysis is discussing in present paper. Nowadays catalysis plays a very important role in the new green chemical industry. Catalysis can reduce the environmental impact of processes and reduce the costs of the processes. The application of new catalysts and catalytic systems is have the dual goals of environmental protection and economic benefit. The PTC technology is used in these applications, because it provides many compelling benefits, primarily related to reducing the cost of manufacture of organic chemicals and pollution prevention.*

**Key words:** : *Green chemistry, sustainable development, phase transfer catalysis PTC, principals, solvents, pollutions*

## **ESTIMATION OF POLYPHENOLIC AND ACID ASCORBIC CONTENT OF CARROTS JUICE MIXED OTHER FRUITS**

**\*Ana LEAHU<sup>1</sup>, Cristina DAMIAN<sup>1</sup>, Mircea OROIAN<sup>1</sup>,**

<sup>1</sup> Stefan cel Mare University of Suceava, Romania, Faculty of Food Engineering, 13th  
University Street, Suceava, Romania, e-mail address: [analeahu@fia.usv.ro](mailto:analeahu@fia.usv.ro);

\*Corresponding author

**Abstract:** *The aim of the study was to determine the changes in physic-chemical parameters (vitamin C, total phenolic compounds and antioxidant capacity) of the carrot juice samples in mixed of apple, banana and peach juices. The total phenolic content was measured by Folin-Ciocalteu reagent assay while the Vitamin C was determined using 2,6-dichlorophenolindophenol titration. Fruit juices were prepared using a robot type fruit squeezer. Were prepared carrot juice, apple, banana, peach and mixed juices in different proportions. The color changing from the different juice samples was measured by lightness values ( $L^*$ ), redness values ( $a^*$ ) and yellowness ( $b^*$ ) values. The result indicated that the change in Hunter parameters,  $L^*$  and  $b^*$ . The vitamin C values have varied from 30.3 mg/100 g for peaches to 3.1mg/100g for carrots, respectively. The total phenolic content ranged from  $438.8 \pm 6.05$  mg GAE/ 100 g, for apples and  $45.2 \pm 0.85$  mg GAE/ 100 g for carrots. The overall study indicated that color is an important parameter to optimize carrot juices samples in mixed of apple, banana and peach juices.*

**Key words:** *carrot juice, polyphenol, physico-chemical parameters, color*

## RESEARCHES REGARDING DEVELOPMENT BODY AND CUTTING REPORTS AT ONCORHYNCHUS MYKISS SPECIES

**\*G.V. HOHA<sup>1</sup>, I. B PAGU<sup>1</sup>, C.E. NISTOR<sup>1</sup>, E. MĂGDICI<sup>1</sup>, B. PĂȘĂRIN<sup>1</sup>**

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine, Animal Science Faculty,  
8 Mihail Sadoveanu Alley, 700489, Iași, Romania

\*Corresponding author: [gabihoha@yahoo.com](mailto:gabihoha@yahoo.com)

**Abstract:** *From fish are important for human consumption only certain body regions. From trout we are interested by the muscular tissue which has the greatest proportion. The purpose of this research is to analyze the development of body and cutting reports ONCORHYNCHUS MYKISS species of different ages (one year, two year and three year). The best efficiency at slaughter yield, respectively 82.15% was recorded at the third batch of rainbow trout, while at the first batch we obtain the lower 78.96%. Setting component parts indicate an increase of the trunk beside total body weight, at a rate of 66.63% for trout aged 1 year to 72.69% at 3 years old trout. Visceral mass accounted for 18.45% of trout with a yearling trout beside 14.25% at 3 years old. Visceral mass accounted for 18.25% at aged 1 year trout beside 14.45% at 3 years old trout.*

**Key words:** *trout, body, cutting, ONCORHYNCHUS MYKISS*



## **EVALUATION OF ENVIRONMENTAL ASPECTS AND QUANTIFICATION OF ENVIRONMENTAL IMPACT INDUCED BY ACTIVITIES INVOLVED IN HEAT PRODUCTION USING GAS**

**\*Camelia POPA<sup>1</sup>**

<sup>1</sup> *Faculty of Food Engineering, Ștefan cel Mare University of Suceava, Romania*  
[kamelia\\_popa@yahoo.com](mailto:kamelia_popa@yahoo.com)

*\*Corresponding author*

**Abstract:** *Air pollution in urban areas is a major concern in modern cities and developing countries. Pollutants, significantly affect human health being responsible for an number of respiratory diseases such as asthma or lung cancer. The aim of this study is to assess the environmental aspects and to quantify the impact induced by the activities of a company wich has as main activity the production, transport and distribution of heat and hot water. The results of the study identifies that the main risk factor, the possibility of environmental and population damage by pollution exposure to CO, NO<sub>x</sub>, SO<sub>x</sub>. After quantifying the environmental impact by the methode of impact global pollution index results that the activity of producing heat by burning natural gas using high efficiency burners and modern technology for water softener (ion exgange processes) have low environmental impact, the index of global environmental pollution calculated for 3 environmental factors (water, air, soil) being 1,05.*

**Key words:** *energy, pollution, aspect, impact, global pollution index*

## A STUDY REGARDING THE AGRICULTURAL POTENTIAL OF SALCEA, FROM THE NORTHEASTERN REGION, IN THE RURAL AREA DEVELOPMENT CONTEXT

Ioan GONTARIU<sup>1</sup>, Marinela CURELEȚ<sup>2</sup>

<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University, Street. Universitatii no. 13,  
720229, Suceava, Romania, e-mail [ioang@fia.usv.ro](mailto:ioang@fia.usv.ro)

<sup>2</sup>Faculty of Food Engineering, Ștefan cel Mare University, Street. Universitatii no. 13,  
720229, Suceava, Romania, e-mail [marinelac@fia.usv.ro](mailto:marinelac@fia.usv.ro)

**Abstract:** *A rural space may be defined as a natural environment in which human activities are settled, provided they are not aggressive to it and they do not promote it's degradation. The relief of Salcea divides equally between hills and plaines. The superior weight of agriculture in the rural space economy becomes more and more argueable because the tendency of „implementing” some urban specific elements (infrastructure development, cultural activities extension, agricultural products processing industry) into the rural space has as a result a decrease of the weight of agriculture reflected in the place it holds in the working population total, in the raw product and the added value. The agricultural production is strongly connected to specific climate and relief. The decreasing tendency of activities balance in the rural space economy is amplified by giving agricultural fields other destination such as forests, roads, touristic or leisure buildings. In it's structure, Salcea town holds 5 villages. In the past, each village functioned as a distinct administrative unit, a „judicia”, led by a „jude”and by a board with consultig role called „elders'council”. Salcea's teritory has hills and plains equally distributed.. The northen part is entered by Capraria's hill, that goes along the left bank of Suceava River. The total area of Salcea is 5,659 ha of which 79.6% is represented by agricultural land, 3.2% by forest or forestry vegetation and 17.2% other types of land.*

**Key words:** *rural space, agricultural product, economic structure, local development*

## **STUDIES REGARDING THE DILUTE ACID PRETREATMENT AND ENZYMATIC HYDROLYSIS OF WHEAT STRAWS FOR BIOETHANOL PRODUCTION**

**\*Eufrozina ALBU<sup>1</sup>, Gheorghe GUTT<sup>1</sup>, Mircea -Adrian OROIAN<sup>1</sup>**

<sup>1</sup>*Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania,  
[e.albu@fia.usv.ro](mailto:e.albu@fia.usv.ro), [g.gutt@fia.usv.ro](mailto:g.gutt@fia.usv.ro), [m.oroian@fia.usv.ro](mailto:m.oroian@fia.usv.ro)*

*\* Corresponding author*

**Abstract :** *In this paper there has been studied the influence of dilute acid pretreatment upon the production of reducing sugars from wheat straws during the enzymatic hydrolysis. The acid pretreatment was led at different temperatures of 120 °C, 130 °C, 160 °C and 170 °C and at different acid concentrations (4%, 1%, 0.5% and without acid) before the enzymatic hydrolysis stage. There have been selected an optimal period of time for the pretreatment of 40 minutes and a temperature of 160 °C, combined with a temperature of 48 °C for the enzymatic hydrolysis. In optimal conditions it was achieved an increasement of the reducing sugars content of 63.37% in comparison with the control sample to which no preliminary pretreatment was applied. The results obtained indicate the fact that the dilute acid pretreatment could increase the ethanol concentration at the end of the fermentation stage. In this case the maximum ethanol concentration of 1.118% vol. was obtained in 72 hours of fermentation with *S. cerevisiae*.*

**Key words:** *lignocellulose, cellulase, DNS method, reducing sugar*

## INFLUENCE OF THE TECHNOLOGICAL CONDITIONS ON THE MIGRATION OF METAL IONS FROM STAINLESS STEEL GRADE AISI 304 AND AISI 321 INTO FOOD SIMULANTS

<sup>1</sup>Silviu-Gabriel STROE, <sup>1</sup>Gheorghe GUTT

<sup>1</sup> Food Engineering Faculty, Department of Food Technology, Food Production and  
Environmental Safety, Ștefan cel Mare University of Suceava  
13, University Street, 720229, Suceava  
ROMANIA  
[silvius@fia.usv.ro](mailto:silvius@fia.usv.ro), [g.gutt@fia.usv.ro](mailto:g.gutt@fia.usv.ro)

**Abstract:** *This paper describes the methods for evaluating the migration of metals from stainless steels AISI 304 and AISI 321, using the acetic acid food simulant solutions. Test parameters intervals were set according with the conditions in the food industry. Concentrations of acetic acid were 3 vol%, 6 vol% and 9 vol% at three different temperatures, 22°C, 28°C and 34°C, respectively, and three levels of environmental agitation, 0 rpm (stationary environment), 125 rpm and 250 rpm, respectively. ICP-MS spectrometry analysis found a strongly dependence between the amount of metal ions migrate into acetic acid solutions and test conditions. Principal component analysis (PCA analysis) was used for data modeling, the results obtained made it possible to establish the optimum conditions for a lower rate of migration into foodstuffs of metal ions dangerous to consumers' health.*

**Key-Words:** *Austenitic stainless steel grades, Acetic acid, Immersion test, Metal release, ICP-MS spectrometry, Trace elements, Multivariable system, PCA method*

## **STATISTICAL STUDY OF THE DEPENDENCE BETWEEN CONCENTRATION OF METALLIC ELEMENTS MIGRATED FROM STAINLESS STEEL GRADE AISI321 AND WORKING PARAMETERS**

**<sup>1</sup>Silviu-Gabriel STROE, <sup>1</sup>Gheorghe GUTT**

<sup>1</sup> Food Engineering Faculty, Department of Food Technology, Food Production and  
Environmental Safety, Stefan cel Mare University of Suceava  
13, University Street, 720229, Suceava  
ROMANIA  
[silvius@fia.usv.ro](mailto:silvius@fia.usv.ro), [g.gutt@fia.usv.ro](mailto:g.gutt@fia.usv.ro)

**Abstract:** *One of the main problems concerning food safety is the possible migration of ions in metallic materials intended to come into contact with food. The aim of this paper is to find and apply the mathematical modeling of experimental data which should describe as accurately as possible the dependence between the variables used in the experimental plan. The research made and presented in this study also aims to create a real possibility for rapid intervention in the process control when one of the parameters cannot be maintained at a predetermined value. In this paper we used some experimental data obtained by testing the migration of metal ions from austenitic stainless steel grade AISI 321 samples in solutions with concentrations of 3%, 6% and 9% acetic acid. To find an accurate mathematical model describing the phenomena of diffusion, ANOVA method, known as the variance analysis, was used. In order to obtain the mathematical model we used a polynomial model with independent variables: corrosive environment temperature (X1), exposure time (X2), stirring environment (X3) and the dependent variables Y - concentrations of elements Ti, Cr, Mn, 56Fe and Ni found in solutions. Values of the regression coefficients very close to the value 1 (the dependent variables coefficients are valid) were obtained, which demonstrates the validity of the applied method.*

**Keywords:** *austenitic stainless steel, mathematical modeling, ANOVA method, dependent and independent variables, coded values, validity of the model.*

## CONTRIBUTIONS TO THE DEVELOPMENT OF THE MATERIAL BALANCE OF MIGRATION PROCESS OF METAL IONS FROM THE AISI304 STAINLESS STEEL IN ACETIC ACID SOLUTIONS

Silviu-Gabriel STROE<sup>1</sup>, Gheorghe GUTT<sup>1</sup>, Maria POROCH-SERIȚAN<sup>1</sup>

<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University of Suceava,  
13 Universitatii Street, 720229, Suceava, Romania  
[\\*silvius@fia.us.ro](mailto:silvius@fia.us.ro); [g.gutt@fia.usv.ro](mailto:g.gutt@fia.usv.ro); [mariap@fia.usv.ro](mailto:mariap@fia.usv.ro)

**Abstract:** *The aim of this work was the development of theoretical and real material balance by studying the diffusion phenomena of the metallic ions from AISI304 stainless steel samples in acetic acid solutions with 3%, 6% and 9% concentrations. The correlation of the quantities of substance which migrate from the metallic alloys in the food simulants through the interaction interface between the two environments can be accomplished through the materials balance developed for each component. To development the materials balance, we used the general stoichiometric equation of a chemical process. Within the comparative study of the theoretical and real mass balance, we have used the experimental data obtained after the migration tests, where the variables were represented by the working parameters: the temperature of the migration testing -  $T$  [°C], the exposure time -  $t$  [min.] and the stirring of the corrosive environment -  $n$  [rot·min<sup>-1</sup>]. The value of each parameter was varied on three levels, in accordance with the real situations met in practice. In order to express the quantitative stage of the interaction between the metallic material and the corrosive environment, at a certain moment, we have used the degree of dissolution  $\delta M$  of the metallic components such as Mn, Cr, 56Fe and Ni. The comparative study of the dissolution rates obtained allows to extrapolate and to elaborate in practice the optimization of the process which occurs at the interface of the two real food environments.*

**Keywords:** *diffusion, stainless steel, acetic acid, mass balance, dissolution rate*

## **THE RELATIONSHIP BETWEEN METAL IONS RELEASED FROM AISI304 AND AISI321 STAINLESS STEELS IN FOOD SIMULANT SOLUTIONS AT VARIOUS WORKING PARAMETERS**

**Silviu-Gabriel STROE<sup>1</sup>, Gheorghe GUTT<sup>1</sup>, Silvia MIRONEASA<sup>1</sup>**

<sup>1</sup>Faculty of Food Engineering, Stefan cel Mare University of Suceava,  
13 Universitatii Street, 720229, Suceava, Romania  
[silvius@fia.us.ro](mailto:silvius@fia.us.ro); [g.gutt@fia.usv.ro](mailto:g.gutt@fia.usv.ro); [silviam@fia.usv.ro](mailto:silviam@fia.usv.ro)

**Abstract:** *The aim of this study was to apply statistical techniques to analyze the experimental data obtained from accelerated migration tests of metal ions from different stainless steels grades in simulated environments foods. For this purpose it was used principal component analysis (PCA) to the metal ions analyzed in acetic acid solutions (3%, 6% and 9% in double-distilled water) at different working parameters, in order to get an overview of the data obtained and to find which variables are related, and which variables are the most important in distinguishing between samples. For AISI304 stainless steel grade was studied the migration of Cr, Mn, Fe and Ni ions and for AISI321 stainless steel grade was studied the migration of Cr, Mn, Fe, Ni and Ti ions. The correlations between all determined variables were studied using Pearson's coefficients with statistical significance at  $p < 0.05$ . Significant correlations between metal ions released in food simulant solution of 3%, 6% and 9% concentrations for AISI304 and AISI321 were found. This study demonstrated that the principal component analysis (PCA) is useful for interpreting data set, providing informations about the relationships between metal ions analyzed release in food simulant solutions from both stainless steel grades, at various working parameters. The results indicate a high Cr and Mn content comparatively with iron and nickel content released from AISI304 in food simulant 6% concentration. High iron content comparatively with chromium and nickel content was realeased from AISI321 in acid food simulant 3% concentration and a high Fe and Ni content comparatively with Cr and Mn content was realeased from same stainless steel grade in food simulant 9% concentration.*

**Keywords:** *acetic acid, metal migration, principal component analysis, correlation matrix*

## RHEOLOGICAL PROPERTIES OF WHEAT FLOUR DOUGH AS AFFECTED BY ALPHA-AMYLASES DERIVED FROM DIFFERENT ORIGINS

Georgiana G. CODINĂ<sup>1</sup> \*, Silvia MIRONEASA<sup>1</sup>

<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University, 13<sup>th</sup> University Street, 720229,  
Suceava, Romania, silviam@fia.usv.ro; codina@fia.usv.ro;

\*Corresponding author

**Abstract.** *The purpose of this study was to investigate the influence of two types of alpha-amylases, one from a fungal origin (*Aspergillus oryzae*) and another one from bacteria origin (*Bacillus subtilis*). Experiments were performed using like row material wheat flour with low alpha amylase content (357 s) on which was added alpha-amylases in doses of 0.02, 0.04 and 0.06 g/kg flour. The rheological properties of the wheat flour dough added with alpha-amylase from bacteria and fungal origin were recorded in the Mixolab device, the most conclusive method on the dough behaviour during the technological process under the alpha-amylase effect. The addition has the effect of decreasing of dough stability, dough viscosity and dough consistency in the second stage of the Mixolab curve. Regarding the starch pasting properties (C3, C4, C5 and the difference of the points C34 and C54) it was also noticed a decrease of these parameters values with the increase of the alpha-amylase addition. For the same doses of alpha-amylase addition it was noticed lower values for Mixolab parameters reflecting the starch pasting properties for the samples with alpha-amylase from bacteria origin while the Mixolab parameters curve from the first stage presented a similar decreasing trend wherever of the origin of the alpha amylase used in the experiments.*

**Key words:** *alpha-amylase origin, wheat flour, rheological properties, Mixolab*



## **INCIDENCE OF FOOD CONTAMINATION WITH *STAPHYLOCOCCUS AUREUS* IN SUCEAVA COUNTY, ROMANIA**

**Florin BÂRLĂ<sup>1</sup>, Maria POROCH – SERIȚAN<sup>1</sup>, Victoria Domnica SĂVUȚ  
(STRATON)<sup>2</sup>**

<sup>1</sup>“Ștefan cel Mare” University of Suceava, Faculty of Food Engineering, Romania, 13th  
University Street, 720229, Suceava – Romania,

E-mail address: [mariap@fia.usv.ro](mailto:mariap@fia.usv.ro), [florin.barla@fia.usv.ro](mailto:florin.barla@fia.usv.ro)

<sup>2</sup>Laborator de analiza medicale Synevo Romania – Suceava, E-mail:  
[victoriasavut@yahoo.com](mailto:victoriasavut@yahoo.com)

**Abstract:** *Staphylococcus aureus* is one of the most wide spread bacterial pathogens initiating food-borne disease worldwide. An investigation was conducted, between 2002 and 2011, in order to evaluate *S. aureus* contamination in various types of animal origin food, commonly consumed in Suceava Country. A total of 781 samples were examined and 15.6% were found contaminated with *S. aureus*. Prevalence rates varied, recording the highest rate on 2006 when over 50% among the investigated food samples and over 20% among the food handlers (nasal cavity and hands) samples were contaminated. Of a particular case from 76 samples analyzed on 2002 and 2006 at Suceava-Bucsoaia students' camp 38.1% were confirmed positive in both food samples and food handlers samples. None of the samples analyzed on 2011 were contaminated. Our findings indicate a substantial improvement of GMP in food processing units and catering divisions as well as the benefit of food safety systems implemented during this period in Suceava Country.

**Key words:** *Staphylococcus aureus, food contamination, food-borne illness*

## SCREEN-PRINTED BIOSENSOR FOR GLUCOSE ANALYSIS

Alina-Mihaela PȘIBILSCHI<sup>1</sup>, Maria POROCH-SERITAN<sup>1</sup>

<sup>1</sup> Ștefan cel Mare University of Suceava, Faculty of Food Engineering,  
13 Universității Street, 720229, Suceava, Romania, e-mail: [alinap@fia.usv.ro](mailto:alinap@fia.usv.ro),  
[mariap@fia.usv.ro](mailto:mariap@fia.usv.ro),

**Abstract:** *The determination of glucose is very important in food processing and fermentation, chemistry, biology and in the diagnosis and treatment of diabetes. Between electrochemical biosensors, the screen-printed devices have a large development in the latest year because are very attractive for the cases where there is a need of automatically manufacture comercial sensors. A complet planar system is realised by printing the working, reference and the counter electrode on the same support. We have constructed a glucose biosensors by immobilizing glucose oxidase (GOD) on modified screen-printed electrodes. Cyclic voltammetry and chronoamperometry determination were made with a PG 581 Potentiostat. Electrochimical characterization and analytical measurements were performed using screen-printed electrochemical cell in a three electrode configuration consisting of a rectangular working electrodes who offer a larger area for enzyme (5x4 mm), a Ag/AgCl reference electrode and a carbon counter electrode. The detection was made at the applied potential of -0.50 V. The immobilized GOD can catalyze the reduction of O<sub>2</sub> and resulted in a high reduction current in the cyclic voltamogram. Upon adding glucose, the reduction peak current decreases proportionally. The strategy of the sensing method is to monitor the extent of the decrease of reduction curent upon adding glucose at selected potential. The proposed biosensor can decrease the applied potential and exclude the interference of commonly coexisted substances.*

**Keywords:** *glucose oxidase, screen-printed electrode, cyclic voltamogram*

## **OCCURRENCE OF SORBIC ACID IN SOFT DRINKS FROM THE ROMANIAN MARKET**

**Oroian Mircea\*, Leahu, Ana, Damian, Cristina**

Faculty of Food Engineering, Stefan cel Mare University

e-mail: [m.oroian@fia.usv.ro](mailto:m.oroian@fia.usv.ro)

**Abstract:** *The aim of this study is to evaluate the occurrence of sorbic acid in soft drinks from the Romanian market. For this study were analyzed 30 samples of soft drinks. The sorbic acid is a natural organic compound used in food industry as a food preservative. The sorbic acid and its potassium and calcium salts are safe food additives with a high acceptable daily intake level for the human consumption (25 mg/l). The maximum allowable level of sorbic acid in food products in Romania is 50 mg/l. The measurement of acid sorbic from the soft drinks was made using a spectrophotometric method using an Ocean Optics spectrophotometer at 532 nm wavelength. The calibration curve was made using 6-concentration level (0, 4, 8, 12, 16 and 20 mg/l sorbic acid), and the regression coefficient of the calibration curve was 0.99. The level of sorbic acid in soft drinks sold in the Romanian market ranged between 0 – 320 mg/l, only 5% of the total samples have sorbic acid more than the maximum allowed by the Romanian legislation.*

**Keywords:** *sorbic acid, soft drinks, food preservatives*

## **THE EVOLUTION OF SOME BAKERY YEAST PARAMETERS UNDER STORAGE CONDITIONS**

**Marcel AVRAMIUC<sup>1</sup>, Cristina DAMIAN<sup>1</sup>, Ana LEAHU<sup>1</sup>,**

*<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University of Suceava, Romania*  
[avramiucm@fia.usv.ro](mailto:avramiucm@fia.usv.ro)

**Abstract:** In this work it has investigated the influence of storage length and temperature on some properties of bakery yeast. The research has been carried out using, as biological material, compressed yeast (*Saccharomyces cerevisiae* L.). Four samples (from a box of compressed yeast) were taken, and stored at four different thermal thresholds (−10°C, 1°C, 15°C, 20°C), determining at 3, 6 and 12 days the following parameters: moisture, titratable acidity, and reduced glutathione. In all cases, the research has shown some modifications of these parameters depending on the temperature and storage length. Both moisture and titratable acidity of stored yeast have evidenced, compared to the control (fresh material before storage), larger reductions after 12 days in samples kept at 15°C and 20°C. The reduced glutathione recorded, compared to the control, increases in all samples stored at the four thermal thresholds, the lowest increases being in the sample kept at −10°C.

**Keywords:** storage, bakery yeast, temperature, moisture, titratable acidity, reduced glutathione

## **A STUDY ON THE COLOUR OF SOME VEGETABLES OILS**

**\*Cristina DAMIAN<sup>1</sup>, Mircea-Adrian OROIAN<sup>2</sup>, Ana LEAHU<sup>3</sup>, Marcel AVRAMIUC<sup>4</sup>**

<sup>1-4</sup> *Stefan cel Mare* University of Suceava, Faculty of Food Engineering, 13  
Universităţii Street, 720229, Suceava, Romania, e-mail: [cristinadamian@fia.usv.ro](mailto:cristinadamian@fia.usv.ro)

\*Corresponding author

**Abstract:** *Improvement in colour of some used sunflower seed oil and olive oil was studied because the reuse of recovered oil could provide considerable savings to food processors. A large proportion of fats and oils in the world are used for the preparation of fried foods. Fried food is desired for its distinctive flavour and odour. Colour is an important property of many foods for two main reasons: its relationship with other chemical and physical properties of food (which may be also related to ripeness, processing techniques, storage conditions, etc.), and its strong influence in consumers' preferences, which govern subsequent buying decisions. Accurate colour specification is often a key part of a complete food-quality control. In this study, 20 consecutive deep-fat fryings were done by using potato samples in sunflower seed oil and olive oil at 170<sup>0</sup>C. Significant changes in sunflower seed oil and olive oil were observed during frying. Changes in Hunter colour parameters were investigated. These parameters were determined on oil samples taken periodically during frying. Frying caused a decrease in Hunter L value and an increase in a, b and TCD values. The Hunter parameters and TCD followed zero order reaction kinetics. Good agreement was observed between calculated and measured data.*

**Keywords:** *frying oil, Hunter colour values*

## CERTAIN TEXTURAL PROPERTIES OF CHICKEN MEAT, INVESTIGATED THROUGH HISTOLOGY AND PHOTONIC MICROSCOPY TECHNIQUES

\*Răzvan Mihail RADU-RUSU<sup>1</sup>, Ancuța Elena PRISACARU (COȘULEANU)<sup>2</sup>  
Tahsin SADY HUSSEN<sup>3</sup>, Gabriel Vasile HOHA<sup>1</sup>

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine, Animal Science Faculty,  
8 Mihail Sadoveanu Alley, 700489, Iași, Romania

<sup>2</sup>”Ștefan cel Mare” University, Food Engineering Faculty, 13 Universității Str., 720229,  
Suceava, Romania

<sup>3</sup>University of Salahadin, College of Agriculture, Animal Production Department, Erbil, Iraq  
• Corresponding author: [rprobios@yahoo.com](mailto:rprobios@yahoo.com)

**Abstract:** *This study is included within a wide range of researches regarding poultry meat quality, consisting in some comparative researches referring to the sensorial features of the skeletal musculature as well as to the nutritional value of the meat produced by several modern broiler brands: Cobb 500, Ross 308, Shaver Starbro, Hybro-PG. The results in the paper reveal some of the poultry muscles histological parameters: myocytes (muscle fibers) thickness and cross-section area, muscular fibers density, and, finally, the proportion of main tissues (pure muscular and connective) in whole muscle structure. 100 broilers (50♂ + 50♀), selected from a shelter accommodating 9500 Cobb 500 chickens of 42 days old, served as biological material in order to elect the samples from five representative muscles: Pectoralis profundis et superficialis, Biceps brachii, Semimembranosus, Gastrocnemius medialis. The tissue samples were used to obtain histological smears on cross-section, which were then analyzed using photonic microscopy. White muscles (breast fillet) were found to have the highest values for the myocytes' thickness (41.11μ), while the contractile cells of the red muscles were thinner (the thinnest within the brachial biceps – 27.9μ) and more dense per surface unit (≈1062 myocytes/mm<sup>2</sup> of muscle). The highest proportion of pure muscular tissue has been found in males' Pectoralis superficialis muscles (65.22%).*

**Keywords:** *chicken broiler, myocytes, density, texture, meat quality*

## **THE EFFECT OF INTENSE LIGHT PULSED TREATMENT ON ASPERGILLUS FLAVUS (MI 148) SPORES**

**Corina NEAGU<sup>1\*</sup>, Liliana GÎTIN<sup>1</sup>, Daniela BORDA<sup>1</sup>**

<sup>1</sup>Faculty of Food Science and Engineering, "Dunarea de Jos" University of Galați,  
111 Domneasca Street, 800201, Romania, Corina.Neagu@ugal.ro, Liliana.Gitin@ugal.ro,  
Daniela.Borda@ugal.ro

**Abstract:** *Aspergillus* are highly aerobic, widely spread moulds species that can be found in almost all oxygen enriched environments, where they commonly grow on the surface of a substrate. *Aspergillus* species are common contaminants of cereals and grow on many plants. Not all *Aspergillus* strains are toxicogenic and cause illnesses. However, some highly toxicogenic strains can produce mycotoxins as secondary metabolites, with a strong negative impact on human and animal health.

*Intense light pulsed treatment (ILP) is one of the minimal technologies that has been proven effective for killing a wide variety of microorganisms. The objective of this study was to understand the influence of different ILP conditions on mould spores survival. The ILP treatment was applied for lamp tensions 1400, 1600 and 1800 V, for different durations (2 – 30) x 10<sup>-3</sup> s. The effect of the experimental conditions was expressed by counting the colonies and the results were modeled with nonlinear regression logistic equation using SAS System for Windows 9 software.*

**Keywords:** *pulsed light, moulds, inactivation, Aspergillus*

**CHANGES OF TOTAL WATER AND DRY MATTER CONTENT  
IN HEALTHY LEAVES AND IN LEAVES INFECTED BY *TAPHRINA*  
*DEFORMANS* AT PEACH CULTIVARS *SPRINGCREST* AND  
*SPRINGOLD***

**Rodica CIOBANU<sup>1</sup>**

<sup>1</sup>„Alexandru Ioan Cuza” University, Faculty of Biology, Iași, Romania  
e-mail: [ciobanu.rodica1981@yahoo.com](mailto:ciobanu.rodica1981@yahoo.com)

**Abstract:** *The objective of this study was to establish the changes produced in the total water and dry matter content in peach leaves from cultivars Springcrest and Springold infected under natural conditions by Taphrina deformans (Berk.) Tul. The infection with the pathogenic fungus produced an increasing in total water content in leaves of this two peach cultivars and a decreasing of dry matter content when compared with the values of this two physiological parameters recorded in healthy leaves. Both in healthy and in curled leaves, the dry matter content is increasing with the leaves aging. Total water content decreases in healthy and diseased leaves with the leaves age, but the values remained higher in attacked leaves. A linear negative correlation was found between the total water and dry matter content, in both healthy and infected leaves at this two peach cultivars.*

**Keywords:** *leaf curl, peach, fungi, phytopathogen agent*



## **IS THE LAYING HENS REARING SYSTEM RELEVANT FOR TABLE EGGS CHEMICAL AND NUTRITIONAL FEATURES?**

**Cristina Gabriela RADU-RUSU (ŞESTALIUC)<sup>1</sup>, Christelle PLOCUS<sup>2</sup>, Céline  
DANDOIS<sup>2</sup>, \*Răzvan Mihail RADU-RUSU<sup>1</sup>**

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine, Animal Science Faculty, 8  
Mihail Sadoveanu Alley, 700489, Iasi Romania

<sup>2</sup>Lycée d'Enseignement Général et Technologique Agricole, BTSA Productions Animales,  
Areines - BP 106, 41106 Vendôme CEDEX, France

\* Corresponding author: rprobios@yahoo.com

**Abstract:** *Do the changes occurred in poultry housing systems affect eggs chemical composition and dietetic parameters? To investigate this hypothesis, we used 700 ISA Brown hens, aged 26 weeks, randomly distributed in two groups: EC group-350 hens accommodated in furnished cages (800 cm<sup>2</sup>/hen) and FR group-350 hens, reared on deep litter, with access to paddock (9 hens/m<sup>2</sup>). Same feed (corn-wheat-soymeal) was used in both groups. 100 eggs were collected/group for chemical assessments on edible compounds (yolk, albumen, whole egg), using 20 replicates per parameter and compound. Analytical chemistry was performed via conventional methods, cholesterol through gas chromatography and caloricity calculated on organic matters energy basis. ANOVA single factor was applied. 100g edible portion of whole eggs in EC group comprised 74.98% water, 1.14% ashes, 12.38% proteins, 10.45% lipids, 1.05% NFE, 174.25 Kcal energy (105 Kcal/egg), 397 µg cholesterol. In FR eggs, water was 75.62%, proteins and ashes didn't significantly change, lipids and caloricity were lower (9.81%, 168.65 Kcal/100 g; 101 Kcal/egg) and cholesterol was 373 µg. Significant differences occurred between groups for water and lipids content (p<0.05). Although the dietetic value was better in free-range eggs, it must reason if this improvement could counterbalance hygienic threats that could accompany free-range production.*

**Keywords:** *enriched cages, free range, eggs, chemical composition, dietetic value*

## THERMAL INACTIVATION KINETICS OF LACTOPEROXIDASE IN MODEL SYSTEM, MILK AND WHEY

Daniela BORDA <sup>1\*</sup>, Mihaela GHERMĂNEANU<sup>1</sup>, Iulia BLEOANCĂ<sup>1</sup>, Corina NEAGU<sup>1</sup>

<sup>1</sup>Faculty of Food Science and Engineering, "Dunarea de Jos" University of Galați,  
111 Domneasca Street, 800201, Romania, Daniela.Borda@ugal.ro, Iulia.Bleoanca@ugal.ro  
Corina.Neagu@ugal.ro

**Abstract:** *Inactivation of lactoperoxidase (LPO) in model system, milk and whey at atmospheric pressure was studied in a temperature range of 60-70 °C. The first order kinetics model allowed the estimation of the inactivation rate constants (k) and the thermal death times (D). D- and k-values decreased and increased, respectively with increasing temperature, indicating a more rapid LPO inactivation at higher temperatures. At 70°C the inactivation of LPO was achieved in milk after 6 minutes and in whey after 4 minutes of thermal treatment. At 67.5°C lactoperoxidase was completely inactivated after 14 minutes in phosphate buffer. In all systems studied the temperature dependence of lactoperoxidase inactivation in milk, whey and model system versus the reaction rates could be accurately described by the Arrhenius equation. The estimated activation energies were of 155.67 kJ/mol for phosphate buffer, 217.79 kJ/mol for milk and 235.57 kJ/mol for whey. The correspondent  $z_T$  values were estimated with the thermal death model and the values obtained were very close for all the three systems studied. For all the loglinear regression equations calculated SAS System for Windows 9 software was used.*

*Lactoperoxidase is an important antimicrobial system and knowing its thermostability in milk, byproducts and model systems allows a better control of the enzyme activity.*

**Keywords:** *lactoperoxidase, inactivation, enzymatic activity, kinetics*

## **THE EFFECT OF LECITHIN ON ALVEOGRAPH CHARACTERISTICS, BAKING AND SENSORIAL QUALITIES OF WHEAT FLOUR**

**\*Georgiana Gabriela CODINĂ<sup>1</sup>, Silvia MIRONEASA<sup>1</sup>**

<sup>1</sup>Faculty of Food Engineering, Stefan cel Mare University, Suceava, Romania,  
[codina@fia.usv.ro](mailto:codina@fia.usv.ro); [silviam@fia.usv.ro](mailto:silviam@fia.usv.ro)

\*Corresponding author

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**Abstract:** *Lecithin is a natural surfactant, which could be used like bread improver in order to improve dough rheological behavior, bread quality characteristics and its sensorial properties. The aim of this study was to investigate the effect of lecithin which was added in different doses (0.1-0.5%) into flour with a very good quality for bread making on dough rheological properties and bread quality. Dough rheological properties measured were dough resistance (P), dough extensibility (L), index of swelling (G), baking strength (W) and configuration ratio (P/L) using a Chopin Alveograph. The presence of lecithin influences the alveogram characteristics by increasing dough resistance, baking strength, the configuration ratio P/L and by decreasing dough extensibility and index of swelling. The bread quality characteristics like loaf volume, porosity and elasticity were improved by lecithin addition. Also, bread sensorial characteristics like external appearance, crust aspect, firmness and taste were better evaluated in the sample with lecithin addition. Therefore, by using lecithin on bread making, the effects of baked products are visible in terms of loaf volume, porosity and elasticity increasing, the freshness preserving, as well as the crumb structure improvement. All the results obtained in this study suggested that lecithin can be used in small concentrations as an excellent improver in bread making.*

**Keywords:** *lecithin, rheological properties, bread characteristics, wheat flour*

## EFFECT OF CITRUS FIBERS ADDITION ON WHEAT FLOUR DOUGH RHEOLOGICAL PROPERTIES

Silvia MIRONEASA<sup>1\*</sup>, Georgiana Gabriela CODINĂ<sup>1</sup>

<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University, 13<sup>th</sup> University Street, 720229,  
Suceava, Romania, silviam@fia.usv.ro; codina@fia.usv.ro;

\*Corresponding author

**Abstract:** *Nowadays, demand for food products with high fiber content is increasing because fiber consumption improves health problems such as diabetes, cardiovascular diseases, colon cancer etc. The citrus such as orange, lemon, and grapefruit can be used as source of fibre for breadmaking products. The quality of bakery products are influenced by the wheat flour dough rheological properties. The addition of different ingredients like citrus fiber affects dough rheology and dough processing as function of the fiber level addition. The effects of citrus fiber addition to wheat flour at the levels of 0, 2, 4 and 6 % on the rheological behaviour of the dough obtained were investigated using as rheological devices Farinograph and Amilograph. Dough rheological parameters measured were water absorption (CH), development time (DT), stability (ST), degree of softening (SDg), gelatinization temperature (G<sub>t</sub>) and peak viscosity (P<sub>V</sub>). The fiber addition has the effect of increasing Farinograph water absorption simultaneously with the increase of the addition level. An increase in development time and stability were recorded upon addition of citrus fiber ≤ 4 %. Also, the Amylograph parameter peak viscosity increased with increase of the citrus fiber level.*

**Keywords:** *citrus fibers, rheological dough parameters, wheat flour, Farinograph, Amilograph*

## **OPTIMIZING THE TECHNOLOGY FOR OBTAINING THE COTTAGE CHEESE TYPE**

**Mihaela TIȚA<sup>1</sup>, Otto KETNEY<sup>1</sup>, Ovidiu TITA<sup>1\*</sup>, Adriana Dabija<sup>2</sup>**

<sup>1</sup>Faculty of Agricultural Sciences, Food Industry and Environment Protection, “Lucian Blaga” University of Sibiu, Dr. Ion Ratiu Street, 550024, Romania, <sup>2</sup> Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania

\*Corresponding author [ovidiu.tita@ulbsibiu.ro](mailto:ovidiu.tita@ulbsibiu.ro),

**Abstract.** *Cottage cheese is an unripened type of cheese, slightly acid, made from skimmed milk. In order to optimize the technology for obtaining this type of cheese, we analyze the activity of lactic cultures in time, taking into consideration the pH for different samples of raw milk. The chemical composition of the milk enriched with solid substance, and the type of culture used had a great influence in the process of obtaining the Cottage cheese. Parameters that were influenced were especially the fermentation period, the pH at curd cutting and further processing. From the obtained results, the use of starter frozen cultures was the most effective option regardless of milk composition. In the full and effective optimization of technological process for obtaining Cottage cheeses, it is recommended the use of enriched milk with solid substance and inoculated with frozen starter culture.*

**Keywords** *cheese, milk, chemical composition, fermentation*

## MODIFIED PRUSSIAN BLUE SCREEN PRINTED ELECTRODES FOR H<sub>2</sub>O<sub>2</sub> DETECTION

F. HUTANU<sup>1</sup>, G. GUTT<sup>1</sup>

<sup>1</sup>Ștefan cel Mare University of Suceava, Faculty of Food Engineering, Universității Street,  
720229, Suceava, Romania, email : g.gutt@usv.ro

**Abstract:** *In this work, presents recent developments in the electrochemical application of disposable screen-printed sensors, to the type of materials used to modify the working electrode. The sensor was based on the electrocatalytic reduction of H<sub>2</sub>O<sub>2</sub> on Prussian Blue modified screen-printed electrode. A comparative study regarding different procedures for modifying the carbon screen-printed electrodes (SPE) with Prussian Blue (PB) was carried out in this work. Two procedures for PB deposition on the SPE electrodes were tested: electrochemical deposition (galvanostatic, cyclic voltammetry) and chemical deposition by the reaction of K<sub>3</sub>[Fe(CN)<sub>6</sub>] with FeCl<sub>3</sub>. Also, the influence of the pretreatment of SPE (+1.7V for 3 min in PBS, pH 7.4) and of the stabilization of PB deposited on SPE (by heating at 100°C) were evaluated. The developed sensors were optimized with respect to the lowest limit of detection achieved for amperometric detection of H<sub>2</sub>O<sub>2</sub>. Analytical parameters, such as detection limit, linearity range and sensitivity have been evaluated, together with operational and storage stability. The improved electro-deposition methods, pH stability and permeability of the optimized PB film provide a further boost in its sensitivity for H<sub>2</sub>O<sub>2</sub> detection, which is a critical parameter in biosensor design and application.*

**Keywords:** *Screen printed electrodes, H<sub>2</sub>O<sub>2</sub> determination, Prussian Blue*

## **ERYTHROSINE B IN THE ENVIRONMENT. AN OVERVIEW**

**Laura Carmen APOSTOL<sup>1,2</sup>, Maria GAVRILESCU<sup>2,3</sup>**

<sup>1</sup>”Stefan cel Mare” University of Suceava, Faculty of Food Engineering, 13 Universitatii Street,

720229 Suceava, Romania; e-mail: [laura.apostol@fia.usv.ro](mailto:laura.apostol@fia.usv.ro)

<sup>2</sup>“Gheorghe Asachi” Technical University of Iasi, Faculty of Chemical Engineering and Environmental Protection, Department of Environmental Engineering and Management, 73 Prof.dr.docent D. Mangeron Street, 700050 Iasi, Romania

<sup>3</sup>Academy of Romanian Scientists, 54 Splaiul Independentei, RO-050094 Bucharest, Romania  
e-mail: [mgav@tuiasi.ro](mailto:mgav@tuiasi.ro)

**Abstract:** *This paper presents an overview on the different methods used for the decolorization of the food dye Erythrosine B in aqueous solutions.*

*Erythrosine B is a red odorless powder used in food industry as a coloring substance. Erythrosine B, also known as E 127, consists essentially of disodium 2-(2,4,5,7-tetraiodo-6-oxido-3-oxoxanthen-9-yl) benzoate monohydrate and subsidiary coloring matters together with water, sodium chloride and sodium sulphate as the principal uncolored components. The methods considered in this paper were sorption, biodegradation and photodegradation. Sorption demonstrated good removal efficiency in the presence of low-cost activated carbon from agro-waste but the treatment increases the operation cost. Because of Erythrosine B toxicity aerobic biodegradation processes showed to be inefficient in the most studies. Considering this, Erythrosine B degradation could be performed by photodegradation process using an adequate catalyst in order to reduce the operation cost.*

**Keywords:** *food dyes, European Union, removal processes*

## **INFLUENCE OF THE ADDITION OF XYLANASE ON THE QUALITY**

## OF WHEAT PREBAKED

**Diana - Delia CIOCAN – ANDRONIC**

*S.C.PAMBAC S.A. Bacau, Romania*

**Abstract:** *Dough added exogenous xylanases hydrolyze soluble and insoluble pentosani a greater or smaller and differently influence the rheological properties of dough and bread quality, depending on their origin. Together with  $\alpha$ -amylase xylanases have a higher ALT structure. This paper aims to present the role and influence of exogenous xylanase addition on quality prebaked bread flour obtained from wheat. We have established three distinct amounts of xylanase and analyzed the farinograph and how they were influenced alveograf dough properties. There have been prebaked bread samples that were stored for different time intervals (10, 20, 30 and 45 days). Bread was stored frozen. After thawing and final baking bread has been baked and watched variation of physical-chemical indicators of the final product (volume, porosity, elasticity, and so on).*

*All samples were compared with a control sample. It was observed that increasing the amount of xylanase leads to an improvement of the volume but above a certain dose volume decreases. And if there was an improvement porosity values with increasing the amount. Both the analysis volume, porosity, elasticity, shelf life had no significant influence on them. All indicators followed the prebaked and frozen bread were obtained worse results than witness who did not undergo this process.*

**Keywords:** *hydrolysis pentosani, freezing, thawing*



## **CHEMICAL COMPOSITION OF BY-PRODUCTS TYPE WHEY AND BUTTER MILK RESULTED FROM MILK PROCESSING, A SOLUTION IN THE PROCESSES OF ECOLOGICAL REEVALUATION**

**\*Costel APETREI<sup>1</sup>,**

*<sup>1</sup>S.C. DORNA LACTATE S.A., Floreni, Suceava, Romania*  
[costelapetrei@yahoo.com](mailto:costelapetrei@yahoo.com)

*\*Corresponding author  
Received 20 October 2012,*

**Abstract:** *Milk and by-products obtained from the processing operations, by their chemical composition and high degree of assimilation, occupies an important role in the human ecological alimentation. This situation has caused the expanding of the researches regarding the superior reevaluation in the de-polluting field. The characteristics of whey depending on cheese production process. It is generally a mild acid with high soluble salt, chemical oxygen demand and fertilizer nutrient content. Chemical components from whey and buttermilk are protein substances over 0,7%, 5% lactose and fats 0,6 - 0,9%. Because of its composition (whey holds most of milk's soluble components), whey is a valuable by product, which can be complexly capitalized through the obtainment of functional foods for human nutrition.*

**Keywords:** *whey, butter milk, by-products, milk processing*

## EFFECTS OF CLIMATIC CONDITIONS ON COLORADO BEETLE (*LEPTINOTARSA DECEMLINEATA* SAY) IN SOIL BIOLOGY AND ITS APPEARANCE IN SUCEAVA

Ioan-Cătălin ENEA<sup>1</sup>, Ioan GONTARIU<sup>2</sup>,

<sup>1</sup>Agricultural Research and development Station of Suceava, B-dul 1 Decembrie 1918, no. 15,  
Suceava, Romania, e-mail [catalin\\_i75@yahoo.com](mailto:catalin_i75@yahoo.com)

<sup>2</sup>Faculty of Food Engineering, Ștefan cel Mare University, Street. Universitatii , no. 13,  
720229, Suceava,  
Romania, e-mail [ioang@fia.usv.ro](mailto:ioang@fia.usv.ro)

**Abstract:** *During all winters between 2005-2009 was registered only one colder period. If in the last two winters, this was registered in the first decade of January, in the winter 2005-2006 the coldest period was the third decade from January, and in the winter 2006-2007 the lowest temperatures, in the air and on soil, were registered in the third decade from February. In order to evaluate the biological reserve were made 15 surveys on the 0-40 cm depth, at the end of October and in the following year after the defrosting of the whole soil profile. The results of the surveys show that in the analyzed winters only 29% were registered significant losses of the hibernate adults. The requests of the insect for a better development are almost similar to the agro-biological requests of the potato culture, but in proportion to the plant, the insect is submitted more to the climatic fluctuations during the year.*

*From a total of 25 emergences in the year 1976-1995 and 2005-2009, 68% from these were produced in April and only 32% in May. During 1976-1991 the tendency of emergence of the hibernate adults was towards the end of April and the first decade of May, following that in the last 10-15 years due to the general global warming, the apparition of the hibernate adults to be produced earlier, respectively the decade second and third of April.*

**Keywords:** *biological reserve, low temperatures, losses, hibernate adults, emergence date*

## **IN VITRO BIOCONTROL ACTIVITY OF TRICHODERMA HARZIANUM AGAINST SOME PATHOGENIC FUNGI ON TOBACCO**

**\*Biljana GVEROSKA**

Scientific Tobacco Institute-Prilep, Republic of Macedonia  
bgveros@yahoo.com

**\*Corresponding author**

**Abstract:** *Biological control is an environmentally friendly approach to the plant protection from diseases. It reduces use of a chemical pesticides and it is a contemporary and reliable model which can be introduced into integrated pest management system*

*The biocontrol activity of Trichoderma harzianum was evaluated against some fungal pathogens on tobacco. In vitro assays confirmed the main mechanisms involved in biocontrol-mycoparasitism, antibiosis and competition for food and space.*

*T. harzianum has a biocontrol activity against all tested fungi. It reduced the pathogen growth and completely overgrowth its colony. Their relative growth in the presence of the biocontrol agent was 13,75 to 62,66%. The percentage inhibition of radial growth ranged from 37,34 to 93,83%. Inhibition of the radial growth of R. solani is 61,10%. Inhibition of the leaf pathogen A. alternata is very high -86,64%.*

*T. harzianum showed the highest antagonistic potential (96,95%) against P. parasitica var. nicotianae, and the smallest (68,67%) – in P. debarianum.*

*This result suggests that T. harzianum can be used in biological control of economically most important fungal diseases on tobacco.*

**Keywords:** *T. harzianum, pathogen, interaction, inhibition*

## ASPECTS CONCERNING AFLATOXINS INCIDENCE IN MILK AND MILK PRODUCTS

- **Adriana DABIJA<sup>1</sup>, Iuliana SION<sup>2</sup>, Mihaela-Adriana TITA<sup>3</sup>, Ovidiu TITA<sup>3</sup>**

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<sup>1</sup>Faculty of Food Engineering, Ștefan cel Mare University of Suceava, Romania

<sup>2</sup>D.S.V.S.A. Bacau, Romania, <sup>3</sup>Faculty of Agricultural Sciences, Food Industry and  
Environment Protection, "Lucian Blaga" University of Sibiu, Romania

[adriana.dabija@fia.usv.ro](mailto:adriana.dabija@fia.usv.ro)

\*Corresponding author

Received 20 September 2012, accepted 12 December 2012

**Abstract:** *Mycotoxins production was found most frequently in pre-harvest grains that are harvested under high temperatures, prolonged drought and high insect activity. Aflatoxine incidence in milk and milk products has become a typical issue for many countries, as there were detected amounts over legal limits in consume milk. Origins of aflatoxins in milk and dairy products are mainly resulted from feeds supplied to animals. This paper proposes a study on aflatoxin incidence in compound feed and milk - raw material in the dairy industry. For determinations was used Elisa enzyme- immunity-test. Records should be maintained for all feeds, feeding practices, milk contamination and animal health and performance for all cases of aflatoxin contamination of milk.*

**Keywords:** *safety, carcinogenicity, maximum residue limit, monitoring*

## **STUDY CONCERNING FROZEN PART-BAKED BREAD TECHNOLOGICAL PROCESS**

**<sup>1</sup>Delia CIOCAN-ANDRONIC, <sup>2</sup>Adriana DABIJA**

*<sup>1</sup> S.C. PAMBAC S.A. Bacau, Romania, , <sup>2</sup>Faculty of Food Engineering, Stefan cel Mare  
University of Suceava, Romania*

**Abstract:** *New technologies are used to satisfy this demand, thus, part baking technology is used for manufacturing fresh products at any hour. Part baked bread is bread baked in moderate conditions which permit a second baking before consumption. Part baked bread is deposited in various conditions and is re-baked in order to attain its final characteristics before being soled to the consumer or before being consumed. Part baked bread is incompletely baked bread. After the incomplete baking process the part baked bread has a stabile shape and volume, a partly formed crust of a very thin layer, little or without any colour. It is commercialized under this form, being subsequently transformed in a finished product, after the final bake. The quality of frozen part baked bread is conditioned, besides obtainment technology, by the establishment of an optimum recipe which contains those ingredients which can remove the negative effects of frosting and defrosting. This paper shows own researches concerning optimization technological process for obtained part baked bread.*

**Keywords:** *part baking technology, frosting and defrosting effects,*

## **TECHNOLOGICAL ASPECTS OF USING RIPENED CHEESE TO IMPROVE THE QUALITY OF MELTED CHEESE**

**<sup>1</sup>Mihaela TIȚA, <sup>2</sup>Adriana DABIJA, <sup>3</sup>Iuliana SION, <sup>1</sup>Ovidiu TITA**

*<sup>1</sup>Faculty of Agricultural Sciences, Food Industry and Environment Protection, “Lucian Blaga” University of Sibiu, Romania, <sup>2</sup>Faculty of Food Engineering, Ștefan cel Mare University of Suceava, Romania, <sup>3</sup>D.S.V.S.A. Bacau, Romania*

**Abstract:** Cheeses are manufactured in a wide variety of types that are differentiated by shape, sensory characteristics, additives, types of packaging and have a multitude of utilization. Is characterized by high thermal stability, are tasty, easy to store, transportation and consumption and will continue to be part of the daily diet of large sections of the population, although studies in the field recommend reducing consumption of this type of cheese. To obtain quality-melted cheese must be used in the technological process quality raw materials. From technological practice was found that best results are obtained by the combination of cheese with different degree of maturation with adequate physico-chemical characteristics of the finished product manufactured. Starting from a standard recipe of obtaining melted cheese, this paper proposes a study on the influence degree of maturation of cheese used as raw materials in industry for obtaining cheeses. Cheeses are still a valuable source of nutrients and can say they have the same nutritional value as the cheese of origin. Decrease case they are challenged, namely the addition of melting salts may have a favourable contribution to the food security of this type of cheese.

**Keywords:** *ripened cheese, melted cheese, food security*

## **EAF ENVIRONMENTAL IMPACT ANALYSIS THROUGH MATHEMATICAL MODELING AND FUZZY LOGIC**

**\*Adrian IOANA<sup>1</sup>, Augustin SEMENESCU<sup>1</sup>, Cezar Florin PREDA<sup>1</sup>**

<sup>1</sup>University Politehnica of Bucharest, Spl. Independentei 313, Bucharest, S6, 060042,  
[adyioana@gmail.com](mailto:adyioana@gmail.com)

\* Corresponding author

**Abstract:** The original optimisations mathematical model of the electric arc furnace's charge preheating process mainly takes into consider 2 thermo-technological aspects: the heat transfer between fluids and particles and the heat transfer between the fizz layer and an exchange surface. According the energetically balance at the gaseous environment level, the conductive transfer model is also analysed through the finished elements method. The results of the mathematical model are presented as the analysis and quantification of the thermo gradients obtained during the charge preheating process. These thermo gradients are determined for various temporal moments and for different capacities of the electric arc furnace. The results of the mathematical model are presented as the analysis and quantification of the thermo gradients obtained during the charge preheating process. These thermo gradients are determined for various temporal moments and for different capacities of the electric arc furnace.

**Keywords:** Environmental Impact, Electric Arc Furnace (EAF), Modelling, Fuzzy Logic

## **ANALYSIS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS FOR THE EMAS REGULATION**

**\*Adrian IOANA<sup>1</sup>, Augustin SEMENESCU<sup>1</sup>, Cezar Florin PREDA<sup>1</sup>**

<sup>1</sup>University Politehnica of Bucharest, Spl. Independentei 313, Bucharest, S6, 060042,  
[adyioana@gmail.com](mailto:adyioana@gmail.com)

- Corresponding author

**Abstract:** This paper presents the main environmental performance indicators for the Eco-Management and Audit Scheme (EMAS), which are used by the specific international regulations. They should therefore be cost-effective and appropriate to the size and type of organization and its needs and priorities. The paper also deals with the indicators' functions, quality and basic categories of environmental performance indicators. The originality of the paper lies in establishing the correlation: Environment – Environment Performance Indicators (EPI) – Organization.

**Keywords:** Environmental Performance Indicators; Eco-Management Audit Scheme



## **STUDY OF MILK QUALITY IN THE NORTHEASTERN PART OF THE COUNTRY**

**\*Ancuța Elena PRISACARU<sup>1</sup>, Gabriela CONSTANTINESCU<sup>1</sup>, Ana LEAHU<sup>1</sup>,  
Marian Cătălin PRISACARU<sup>2</sup>**

*<sup>1</sup>Faculty of Food Engineering, Stefan cel Mare University of Suceava, Romania  
„Ion Ionescu de la Brad” University of Agricultural Sciences and Veterinary Medicine, Iași*

*[prisacaru.ancuta@fia.usv.ro](mailto:prisacaru.ancuta@fia.usv.ro)*

*\*Corresponding author*

**Abstract:** *Our objectives were to describe raw milk quality produced in the northeastern part farms of the country. Methods according to EU quality standards for raw milk produced in private farms must meet strict quality standards as the microbiological and hygiene-related rules on collecting and receiving milk in these farms. Physical-chemical and microbiological testing of raw milk, it highlights the quality of the fat content, pH, acidity, and how they have complied with the conditions of hygiene after milking, by setting the total number of germs and udder health by establishing the existing level of somatic cells in milk harvesting.*

**Keywords:** *milk, acidity, pH, fat, somatic cells, total number of germs*

## BIOCHEMICAL ASPECTS OF WATER DECONTAMINATION WITH OZONE

I. A. BELYKH<sup>1</sup>, S. I. SAMOYLENKO,<sup>1</sup> M. S. ROGOZYNSKYI<sup>2</sup>, I. A. WINKLER<sup>3</sup>

<sup>1</sup>National Technical University “KhPI”, Kharkiv, Ukraine, [ari74@meta.ua](mailto:ari74@meta.ua)

<sup>2</sup>National Technical University “KhPI”, Chernivtsi Faculty, Chernivtsi, Ukraine,  
[rmyron@ukr.net](mailto:rmyron@ukr.net)

<sup>3</sup>Yu. Fedkovych National University of Chernivtsi, Chernivtsi, Ukraine, [igorw@ukrpost.ua](mailto:igorw@ukrpost.ua)

**Abstract:** *An article deals with the mechanism of ozone effect on microorganisms. It is known that ozone can destruct various bacteria. Kinetics of bacteria inactivation under the influence of ozone depends on ozone content in the ozone-air mixture, dissolved ozone concentration, amount of ozone absorbed by bacteria, time of the microorganisms' exposure and their type. It is suggested that in the biochemical sense, ozone acts through the catalytic oxidation of bacterial proteins and their destruction to amino acids. An influence of the oxidized products of bacteria decay on the kinetics of the residuary bacteria dying in the process of water ozonization is evaluated. It is proved that the water ozonization promotes better population health conditions.*

**Keywords:** *ozone, fluorescence, bovine serum albumin, conformations changes, microorganisms*