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**COMMODITY SCIENCE
IN RESEARCH AND PRACTICE
– CURRENT ACHIEVEMENTS
AND FUTURE CHALLENGES**

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Preface

Ladies and Gentlemen

It is an unusual pleasure for me, as Rector of Cracow University of Economics, to welcome all persons participating in the 19th IGWT Symposium. This is an extraordinary opportunity for meeting that this time is organised by the university that celebrates the 90th anniversary. When established in 1924 known as the Higher College of Trade, now is the most popular university of economics in Poland comprising 4 faculties and above 21,000 students.

The tradition of IGWT meetings, the oldest and largest conference in commodity science, is that every time they are held at another prestigious scientific centre. This international meeting offers a forum for discussion of the most important areas of contemporary commodity science. The impressive thematic range and the presence of outstanding experts make the Symposium an unique event. The contents of this publication fully reflects the prestige of this unusual conference.

I am convinced that the 19th IGWT Symposium organised in the most beautiful city of Krakow will meet your expectations, bring very interesting and fruitful discussions, allow valuable contacts to be established and inspiration, I am cordially wishing you the same.

Andrzej Chochół
Chairman of Organizing Committee
Rector of Cracow University of Economics

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THE INTERRELATIONSHIP BETWEEN SUSTAINABLE DEVELOPMENT AND CORPORATE SOCIAL RESPONSIBILITY

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Sustainable development is the process of long-term changes aimed at balancing the three systems: economy, environment and society. This means a development that stimulates economic growth necessary to get material and social welfare, while considering environmental quality. The concept of sustainable development, most often considered in a regional, national and local scales, applies also to the management level in an enterprise that creates a surplus value through its activity and contributes in social development, but by using environmental resources it often introduces undesired changes. Sustainable development at enterprise level refers to its activity by balancing the economic, ecological and social goals. Sustainable development of an enterprise shall be thought as a process where environmental resources are transformed into economically and socially efficient products. Social responsibility can be interpreted as an ethically conducted business activity in striving for social welfare in compliance with applicable law and behavior norms. This is a concept that assumes building long-term positive relations with stakeholders. According to the sustainable development principles also the enterprise management should take into account the stakeholder expectations, thus being connected with taking social responsibility. Both in the specialized literature and in practice attention is paid to relationships between the concept of sustainable development and corporate social responsibility (CSR). These two concepts are considered as independent ones, but often are identified as the same. Sometimes it is even occurs that in the same reporting competition the enterprise submit both reports on sustainable development or corporate social responsibility. The aim of this paper is to identify similarities and differences between sustainable development and corporate social responsibility. The sustainable development and corporate social responsibility standards are compared, while using especially ISO 26000 as a standard binding these two concepts.

Keywords: corporate social responsibility, sustainable development, reports

GREEN PUBLIC PROCUREMENT IN STIMULATION OF THE SUSTAINABLE CONSUMPTION AND PRODUCTION PROCESS

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Achieving sustainable development requires actions for sustainable production and consumption. It is difficult to complete this task, especially in the economic crisis conditions. The European Union continues works on provisions of a strategy targeted at achieving sustainable development. Green Public Procurement (GPP) is one of the most effective pro-ecological actions that stimulate sustainable production and consumption and play more and more important role in EU member states. Green public procurement consists in planning and performing bidding processes by public authorities based on unified criteria leading to goods and services, including construction work, with a minimized environmental impact over the entire life cycle. The aim of the European Commission is to unify ecological product criteria in EU member states. To achieve this goal the European Commission develops and updates the green criteria for granting public procurements within the selected priority product groups recommending member states to use these criteria. It also proposed GPP objectives to member states to be achieved by 2020. The aim of this paper is to present GPP assumptions in the context of sustainable production and consumption as well as legislative conditioning and advantages resulting from implementation and barriers related to realization of GPP. The GPP criteria for particular product groups and GPP performance in Poland are also discussed. In addition, the implementation of Life Cycle Assessment and Life Cycle Costing is taken into account as necessary procedures in the process of bidding planning and performing for GPP.

Keywords: sustainable development, production, consumption

AN EFFECT OF THE TREATMENT PROCESS ON DRINKING WATER QUALITY IN CRACOW

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The requirements to be met by water quality depend on its intended use. However, the conditions to be fulfilled are specified by the user. Therefore water designed for human consumption and industrial purposes has to comply to the strictly specified standards. Untreated water is subjected to various processes commonly named as treatment. This consists in removing undesired water components, i.e. harmful admixtures occurring in excessive amounts and adding substances improving water quality. The crux of the matter to obtain drinking water of highest quality is the selection of an appropriate technology assuring proper water treatment results. There are physical, chemical and biological water treatment processes. In practice their combinations are used. The aim of this paper is to determine an effect of water treatment technology on its quality at 4 Water Treatment Plants of the Municipal Water Supply and Sewerage Plant in Krakow, Poland. An analysis of the selected physicochemical and bacteriological parameters of crude water was carried out for crude water – before treatment and drinking water – after treatment determined in the years 2008 – 2012. In this paper the relationship between drinking and untreated waters for the following water purity indicators are presented: pH, alkalinity and oxygen chemical demand. In addition, the monthly average concentrations of chlorates, chlorities and aluminum within the specified period of time are presented. The above mentioned substances were present in treated waters in trace amounts. Based on an analysis of water designed for consumption – after treatment and disinfection the following microbiological indicators were determined: Coliform bacteria: *Escherichia coli*, *Enterococci faecalis*, *Clostridium perfringens* and total microorganisms count 22°C after 72 hours. A microbiological analysis of drinking water was used to determine the efficiency of disinfection agents used in particular water producing plants.

Keywords: water treatment, water disinfection, water quality, water quality indices, water treatment plants

THE MODERN TREND IN ROMANIAN HOTEL RESERVATION – AN EVOLUTION TOWARDS ONLINE BOOKING

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Innovation is a matter of reference for today's business world, being present in all sectors. Buyers desire to have customized products or services – a fact which caused higher investment in innovation, exceeding the boundaries of production lines. Tourism is one of the areas that for a long time followed a pattern recognized and accepted by all stakeholders. It was obvious that the offers of the hospitality field to get to travel agencies that the tourist to choose the most suitable offer for him. Travel agent exercised his role by informing and closing the deal. Thus, innovation was not a priority as things could be done very well in this manner. The first segment of the anticipated direction to be followed by tour operators was the aviation. The introduction of booking systems such as Amadeus or Worldspan made for the first time to be put a question about the future and the role of the travel agent. Once the internet started being used by many people, the need of a change became evident. Tourism product began to transform and become online available, taking the advantage of continuous research and development in the IT field. This study examines how tourism product transformed over the years through innovation. In this regard there were analysed major websites, such as Booking.com and Tripadvisor to see the differences between traditional tourism product in the hospitality industry and the actual one. Thus one other objective it was to review how tourist's opinions posted on websites/forums can influence further decisions regarding in this domain. Hotels taken into account are from Bucharest, Romania with comfort category from 2* to 5*. The purpose of this research is to position tourism products from Romania in the context of innovation and to provide a starting point for both further research and tourism operators.

Keywords: innovation, tourism innovation, tourism product innovation in the hospitality industry

THE INFLUENCE OF HALAL CERTIFIED PRODUCTS IN ITALIAN FOOD MARKET

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Purchasing decisions are influenced by several factors. Among the most relevant there are religious belief and identity, two aspects highly considered by Muslims people (Islam is the world's second largest and fastest-growing religion). Even if in the recent past Muslims purchased goods (mainly food) avoiding products not allowed by Islamic principles, today they actively ask for complying ones. Muslims use two opposite terms to describe products and services in or out of their religious code: Halal and Haram. Halal indicates what is permitted and Haram what is forbidden. Muslims firmly request certified products matching halal process standards. It is estimated that the global halal market is growing mainly in the halal food sector, whose up to date value is approximately equal to 16% of the whole global food industry and in the near future, to 20% of total food world trade. A World Halal Secretariat research highlights that the global halal products market is estimated in US\$ 2,300 billion (not including banking) of which food and beverages represent the 67%, pharmaceuticals 22% and cosmetics and personal care amounting to 230 US\$ billion. One of the key factors contributing to this market growth is the increase in the Muslim population equal to approximately 1.6 billion representing the 25% of the total. The European Union is an important halal market considering that the 7% (51 millions) of Muslims lives there especially in France, in Germany and the United Kingdom. There are also substantial Muslim communities in Eastern Europe, specifically Albania (70% Muslim). Halal certification is a valuable opportunity for Muslims toward a wider integration and for markets toward new targets. However so far there is not yet a unique standard procedure to guarantee halal products. The objective of this paper is mainly to analyses different worldwide halal certifications procedures and then to evaluate halal certification impact on Italian food market.

Keywords: halal products, halal market, consumer behaviour

THE EVOLUTION OF OPEN INNOVATION IN LARGE FIRMS

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Since the late mid XX century, the studies that show the existence of a correlation between the network among companies and the outputs gained, have started. According to the most recent scientific papers, this correlation has been theorized in a structured way known under the paradigm of “open innovation” (Chesbrough, 2003). This topic, especially from the point of view of the value and the business sustainability, has been a source of debates in the literature. In the present research, we thought it would be worth addressing the studies of the diffusion rate of open innovation. This elaborate takes into consideration two mainly different aspects: the first one consists in the analysis of the development of the concept of open innovation; the second one offers an analysis of the main output of the empirical researches on this topic. The final aim of the present work is to find out the adoption rate of these new innovative processes by large firms. In this way, we could emphasize which are the main typologies of open innovation adopted. In this study we point out that the change on the innovation paradigm, from the closed innovation to the open innovation, does not take place without any difficulties. These ones are a consequence of some structural barriers mainly caused by the processes implied in the change. We reached this conclusion through an analysis structured in several phases: at the beginning it was necessary to draw an overview of the evolution of the concept of open innovation; secondly an analysis of the open innovation processes which have been found out, has been presented. Third, this work carries on a deeper overview on the empirical researches that have been done on the adoption rate of the open innovation paradigm by large firms. In conclusion, the work closes with a critical analysis on the topics addressed above. Finally, as a result, of this analysis it has been possible to confirm that the diffusion rate of the open innovation is constantly raising among large firms. This rise happens thanks to the cooperation between the large firms and the external environment, which allows an increasing number of advantages.

Keywords: open innovation, large firms, technology development, innovation

A STUDY ON INNOVATION AND MARKETING STRATEGY OF KOREA SMARTPHONE IN THE WORLD AND EUROPEAN MARKET

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When smartphone was introduced by Apple in early 2007, most people believed Apple will dominate world smartphone market. But people's prediction was completely wrong. Now Samsung electronics and LG electronics which are Korea electronic company, have a corner on the market since 2011. For instance, Samsung Galaxy smartphone has more than 30% of world market. So, this study will search innovation and market strategy of Korea smartphone. Especially, we will intensively study European smartphone market and provide managerial implication.

Keywords: smartphone, innovation, marketing strategy, Apple, Samsung, european market

THE FRL INSTRUMENT – OUTLINE OF THE POLISH STUDY

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The FRL is widely used instrument to research food related lifestyles in cross-cultural valid way. The purpose of the study was to apply the FRL instrument in Poland and formulate general conclusion on food related lifestyles of Polish consumers in five construct measures: cooking methods, purchasing motives, quality aspects and consumption situations. The basic instrument used in the survey was the 69-FRL questionnaire, consisting of 23 scales with three items each; only one scale was slightly modified. All items are rated on a 5-point Likert-type scale. Data collection process consisted of two steps. In the first step data was collected by personal interviewers, a quota samples based on major demographic and geographical criteria, in the second stage the on-line survey was used. After rejection of incomplete on-line questionnaires (about 10%), the final sample size was 948 (413 results of personal interviews and 513 ones of online survey). The results confirmed that FRL is an effective instrument to food related life styles, and the profile of Polish food consumers can be grouped into five dimensions: cooking methods, purchasing motives, quality aspects and consumption situations. The results of the study will be used as a basis for a more extensive exploration of differences and similarities between Polish food consumers, according to the methodology proposed by the authors of FRL instrument. Next steps of the analysis could be e.g. identifying the food related lifestyles of Poles, based on the pre-defined, verified theoretically and practically constructs and dimensions of FRL instrument, identifying the differences between consumers, conducting the segmentation of Polish food consumers.

Keywords: FRL, food related lifestyles, Poland

ELECTRICAL CONDUCTANCE PROPERTIES OF BREWERS MALTS

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This study was aimed at determining electrical properties of 8 brewers malts expressed by conductance parameters. Experimental material included: three barley malts – Pilsen, smoked and caramel; and five malts from other cereal species – wheat, spelt, emmer wheat, oat and rye, with similar water content of 7%. The emmer and oat malts originated from Steinbach malthouse, whereas the others – from Weyermann malthouse. Moisture content of malts was determined according to PN-EN ISO 712:2009. Analyses of their conductance properties were carried out in a thermostatic system with temp. of 20 °C. A glass container (10.94 × 33.22 × 81.74 mm) completely filled with the experimental material was placed in a measuring cell with water jacket that was coupled to a thermostat. A measuring attachment was used to couple the system with an LCR E4980a meter by Agilent to enable measurements of electrical parameters: impedance (Z), reactance (X) and admittance (Y) in a frequency range from 20 Hz to 2 MHz, at constant voltage of 250 mV. The measurements were performed in 9 replications for each sample. The study demonstrated that the greatest differences in Z and X values between the analyzed malts were achieved in a frequency range from 2 to 20 kHz, whereas in Y values – in a frequency range from 200 kHz to 2 MHz. Two groups of malts with similar conductance properties were distinguished: group I – Pilsen, caramel and oat malts (Z and X values around 10⁶ Ω), and group II – emmer, wheat, spelt, rye and smoked (Z and X values around 10⁵ Ω). Results achieved indicate the possibility of applying conductance properties for malts classification, therefore future studies should focus on the search for correlations between electrical parameters of malts (in optimal ranges of measuring frequencies) and their physicochemical characteristics.

Keywords: brewers malts, impedance, reactance, admittance

ASSESSMENT OF SELECTED QUALITY ATTRIBUTES OF STIMULATED BEEF

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The goal of this study was to determine changes in pH value and color of stimulated fresh beef depending on the type of muscle as well as age and sex of animals. The experimental material included meat from heifers and bull calves aged ca. 18 months and from Black-and-White cows aged ca. 10 years. Ca. 40 min after stunning the left carcasses were subjected to electrical stimulation using an own-construction device, whereas the right carcasses served as the control sample. After ca. 24-h chilling with the accelerated method at air temperature of 0 – 2 °C: the longissimus muscle (commercial name „Rostbef”) and the semitendinosus muscle (commercial name “Zrazowa górna”) were dissected from both stimulated and control half-carcasses. pH measurements were conducted in the m. longissimus muscle ca. 2, 6 and 24 h after stunning with the use of CP-411 pH-meter, whereas color measurements were performed in m. longissimus and m. semimembranosus after 24-h chilling in the CIELAB scale, using a Hunter Lab spectrophotometer. The study demonstrated that the application of electrical stimulation had a positive effect on the improvement of beef quality expressed by: significantly faster rate of pH changes, lower final pH value and brighter color of stimulated meat compared to pH and color of the non-stimulated meat. It was also observed that differences between pH values and values of L* parameter of the stimulated and non-stimulated meat depended on the age and sex of animals. Results obtained in the study enabled concluding that the best quality was achieved for beef originating from heifers, especially from the stimulated longissimus muscle that was characterized by the final pH value of 5.74 and the highest values of color parameters: L*~38, a*~17, and b*~13.

Keywords: beef, electrical stimulation, quality, pH, color

THE ENVIRONMENTAL MANAGEMENT SYSTEM: A VECTOR FOR THE TERRITORIAL DEVELOPMENT. THE EXPERIENCE OF THE TOWN OF GIAVENO (ITALY)

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In the context of the environmental tools that can be adopted by local authorities, the Environmental Management Systems (EMSs) can play an important role in the management of the direct and indirect environmental aspects and impacts of the activities necessary to govern a territory. This study presents the application and certification of the Environmental Management Systems in accordance with the ISO 14001:2004 International Standard, issued to the Town of Giaveno. Giaveno, situated in the North-West of Italy (Piedmont Region) with 17,000 inhabitants, has been involved in several actions concerning the correct management of environmental aspects resulting from its activities. The certification of its Environmental Management System – obtained in 2012 - represents an important tool for providing correct information to stakeholders (in primis the citizen) and to give proof of its sensitivity to the environmental issues. Firstly, this work presents the Environmental Management System architecture applied to the Town of Giaveno, the strong points and the critical aspects resulting from its implementation and the objectives planned and achieved by the Administration. Secondly, starting from the assumption that the direct aspects are less important for a local authority than territorial planning, this study contains some reflections on the Environmental Management System of the Town of Giaveno as a “fly-wheel” to spread such an environmental action to a more extensive area.

Keywords: environmental management, local authorities, territorial development

THE AUTOMATED EXPRESS TECHNOLOGIES OF LOT IDENTIFICATION OF SPIRITS FOR ITS SAFETY AND AUTHENTICITY

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Big sales volume of low-quality and adulterated alcoholic beverages and high health risk for consumers of such goods are the two main factors providing a strong necessity for development of an effective system for identification and traceability of spirits on different stages of the product life cycle: from producers to consumers. Thus a data analysis system for lot identification of spirits that is able to prevent production of adulterated and low-quality commodity has been developed. The system is based on usage of a complex of physicochemical parameters: UV-absorbance spectrum and conductivity. These parameters that are unique for each lot of spirits can be evaluated at minimum time and costs as neither highly qualified personnel nor expensive analytical equipment are needed. The principle of system operation is to use automated technology in order to verify lot parameters registered by producers or importers which are stored in a unified database with the parameters of objects from identified lots. Criteria of adulterated and genuine goods recognition based on statistical data classification (cluster analysis) have also been developed. These criteria are database-independent and consider only the spectrum curve form and absolute values of conductivity. An original technology of mathematical data treatment is presented to store the values of the registered parameters in a compressed form ensuring the maximum effectiveness of disk space usage. This technology allows compressing the data 10 times and more in order to encode the data identifying each lot into a printable QR-code with a digital signature preventing its adulteration. Special software compatible with all types of analytical equipment has also been created for data analysis system application to production.

Keywords: spirits, lot identification, data analysis system, ultraviolet absorbance spectrum, conductivity

ROMANIA'S EXPERIENCE REGARDING THE PRODUCTION, MERCHANDISING AND CONSUMPTION OF PRODUCTS BASED ON GMO'S

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This paper aims to identify Romania's positioning on the EU market as a producer, merchandiser and consumer of GMO based products. The paper also presents a comparison between the Romanian experience in cultivating genetically modified products, for example soybean and other European countries such as Austria, Italy, Slovenia and Poland. This present paper has also managed to demonstrate through an exploratory research the following aspects: the evolution of consumption and production of products based on genetically modified organisms in Romania as well as the evolution of the area cultivated with genetically modified organisms in this country. The paper also indicates Romania's position within the European market development of genetically modified organisms among other actors of this market. Furthermore, the paper presents both aspects to clarify the development in the field of old and new approach legislation regarding the control of cultivation, production and marketing of GMO's and the food safety legislation on genetically modified organisms. Therefore, the paper shows statistical data concerning the Romanian area cultivated with genetically modified organisms. It also presents the main GMO-based products in Romania as well as the main producers and distributors of GMO based products in this country. The present paper also concentrates upon the consumer's perspective regarding genetically modified organisms such as: the consumer's knowledge about the concept of genetically modified organisms, the perception that consumers have about the "new technologies" applied to food, their attitude toward GMO based products, risks or advantages of the GMO based products, the safety problems concerning GM food and the need of the consumers regarding GMO-based products for scientific progress.

Keywords: production, genetically modified products, merchandising, consumption, innovation

EFFECT OF BROMELAIN ON SELECTED PERFORMANCE PROPERTIES OF GEL LAUNDRY DETERGENTS

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The article examines the effect of concentration of a plant enzyme (bromelain) on the performance properties of gel laundry detergents. Enzymes are important ingredients of liquid washing agents. The most commonly used are proteases, lipases and amylases. Enzymes are effective at quite low concentrations, in the range of decimal fractions of a percent, and at low temperatures. In addition, they are completely biodegradable and have no adverse impact on the natural environment. Enzymes are usually produced by biotechnological synthesis but they can also be obtained by direct extraction from plants. One of such plant enzymes is bromelain derived from pineapple. Bromelain belongs to the group of protease enzymes. In the paper samples of products containing between 0.25 and 1% of the enzyme were prepared. Tests of the performance properties of gel laundry detergents: viscosity, foaming properties and washing properties were conducted. Viscosity measurements were performed with Brookfield DV-III rotational viscometer. Viscosity is measured with a rotating measuring tip called the spindle, which is immersed in the test fluid. The foaming properties were determined using a method set out in the Polish standard. The method involved a measurement of the volume of foam produced by a free flow of the gel laundry detergent solution from a distributor onto the surface of the same solution inside a graduated cylinder. The washing properties were determined on the basis of methodology set out in the Polish standard. The method involved washing of pieces of soiled test fabric in the test washing agent and in the reference washing agent, in strictly defined conditions. For the sake of comparison, the same tests were also performed for a commercially available product. The composition of the commercial product, based on the manufacturer's data, includes 5-15% anionic surfactants, <5% nonionic surfactants, phosphonates, soap, enzymes, fragrance. Enzyme concentration was found to have a significant effect on the viscosity of gel laundry detergents and on their ability to remove protein stains. However, bromelain was not shown to have a major effect on foaming properties and on the ability to remove fat and tannic stains.

Keywords: bromelain, plant enzymes, gel laundry detergents, washing ability, foaming properties

ITALY'S ROLE IN THE EUROPEAN NATURAL GAS MARKET

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Nowadays, natural gas is a vital component of the world's energy mix and, in addition, is the world's fastest growing fossil fuel. In fact, natural gas is the cleanest fossil fuel in terms of CO₂ emissions, consequently it represents the quickest way to reduce greenhouse gas emissions and it will be more popular in the future as a consequence of environmental issues and concerns. As well known, for the short term the EU has committed to cutting its emissions to 20% below 1990 levels, whereas the European Commission proposes that the EU set itself a target of reducing emissions to 40% below 1990 levels by 2030. *Natural gas will play an important role* in reaching these goals, but European reserves are being depleted. Meanwhile, on a global scale, resources are spread amongst all continents and remain abundant. Therefore, supplying European consumers with natural gas which is both affordable and reliable, represents a major objective. The creation of an efficient interconnected market for natural gas, based on a mix of transport infrastructure, ranging from transnational pipelines to LNG vessels and regasification terminals, may be the most effective response to the challenges of the European future, from both an environmental point of view as well as an economic point of view. This paper describes the European natural gas market and specifically examines the role of Italy, as regards all the strategic projects that represent an important contribution for Italy, both for covering internal energy demand as well as for becoming an energy hub in southern Europe and the Mediterranean. These projects include new regasification terminals (Livorno, Gioia Tauro, Porto Empedocle *etc.*) and the gas pipelines between Russia and North East Italy (*Southstream*), between Azerbaijan and South East Italy (*Trans Adriatic Pipeline, TAP*), between Algeria and Sardinia (*Gasdotto Algeria Sardegna Italia, GALSI*), between Greece and South East Italy (*IGI Poseidon*).

Keywords: EU, energy, natural gas, pipelines

THE PROBLEM OF ENRICHING YOGHURTS WITH ASCORBIC ACID

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Yoghurts have become commonly consumed in a lot of countries. Dieticians as well as consumers have appreciated their therapeutic properties. Massive consumption together with yoghurts' medicinal qualities results in various nutritious ingredients being added to them. In this work ascorbic acid has been used as a substance which being added to yoghurts influences their nutritious properties by increasing the amount of *Str.thermophilus* and *Lbc.bulgaricus* bacteria. The moment of fortification influenced the survival of yoghurt bacteria-fortification after incubation turned out to be more beneficial. Yoghurts for tests were manufactured under laboratory conditions. One litre of UHT milk was treated with bacterial cultures of *Lbc. bulgaricus* and *Str. thermophilus*. The amount of bacteria was calculated for one litre of acidulation and accordingly to the vaccine producer's instruction. Next, the substance was poured into three plastic containers (PS). The content of one of them was enriched with ascorbic acid, which was introduced as a liquid solution. The containers were sealed and the cultures were incubated at temperatures $42^{\circ}\text{C}\pm 1^{\circ}\text{C}$ for 5 hours. After that time, the liquid solution of ascorbic acid was added to a clot in one of the non enriched containers, then the mixture was stirred, sealed again and all samples were stored for 28 days at the temperatures of $4^{\circ}\text{C}\pm 1^{\circ}\text{C}$. For further studies, the well-stirred representative sample was chosen, from which 10 ± 1 g of material was weighed. That amount was used for preparing 10^{-1} and subsequent dilutions. Using the appropriate dilutions inoculation was made on two parallel Petri dishes and then the cultures were treated with the suitable basis. For *Str.thermophilus* M-17 (Biomerieux) was used while for *Lbc.bulgaricus* MRS (Biomerieux). When the incubation finished, the colonies of each kind of germs were counted separately. The tests were conducted 7-day intervals, the first one immediately after the milk's incubation. The results show that the addition of ascorbic acid had a effect on the growth of yoghurts' fermentation bacteria. Definitely, a better result was obtained when the introduction of ascorbic acid took place after the incubation of yoghurts. Intense growth of bacteria could be observed in the first 24 hours in the samples enriched with ascorbic acid after the incubation.

Keywords: yoghurts, ascorbic acid, *Str.thermophilus*, *Lbc. bulgaricus*

COMPLIANCE OF PRODUCTION PROCESSES IN AREAS WITH HIGH INCIDENCE OF ETHNIC ENTREPRENEURSHIP: THE CASE-STUDY OF PRATO INDUSTRIAL DISTRICT

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The industrial district of Prato is today facing several opportunities and challenges derived from globalization processes and increasing multiculturalism, related to the high incidence of ethnic entrepreneurship in the local economy. In particular, it is necessary to promote innovative solutions to facilitate upgrading processes from illegality and to promote socio-economic integration, as a strategic asset to valorize local resources in a perspective of inclusive development. Since September 2013, the Local Development Unit of ARCO-Lab has been conducting an action-research project to develop an integrated and flexible tool for firms' check-up. The aim of this tool is to detect firms' non-compliance to mandatory legislation and opportunities for upgrading, providing technical assistance to entrepreneurs in order to improve management systems of productive processes in the textile and food industries of the district. In methodological terms, the elaboration of this innovative tool started from a survey of existing check-up instruments within the territory of Prato, as input for the integration of a check-list with regulatory requirements of different management areas (safety on workplaces, environmental management, employment contracts, taxation, hygiene). Particular effort has been devoted to dialogue with trade associations, regulatory bodies and ethnic communities active within Prato industrial district, in order to build on local knowledge, taking account different instances and existing good practices. The experimentation of this integrated tool for investigation and firms' check-up confirms the support it can provide towards the compliance of productive processes to mandatory legislation and the promotion of quality and ethics along value chains.

Keywords: upgrading, integration, check-up, ethics

INFLUENCE OF ETHNICITY ON THE PERCEPTION OF FOOD THROUGH THE LENS OF UNIT PACKAGE

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Individual package is now recognized in most countries of the world as one of the basic instruments of product strategy whose task is to ensure the desired quality, create a positive image and brand on the market. Properly selected components of the packaging, in particular, the type of the packaging material used, its structural form and shape, color, graphics, size and method of closure, allows you to create the desired image of the product, which is particularly important in the case of food products. The image of the packaging should be harmonized and taking into account the factors of ethnic, social, legal and consumer habits. Appropriate design of the packaging should therefore be a planned activity because it is to become a stimulus of choice and a factor affecting profitability of the organization. The aim of this study is to investigate the influence of selected packaging in customer purchase decisions of food products, with a particular focus on ethnic factors using the example of Polish consumers (representatives of the EU) and Norwegian ones (representatives of the EFTA countries).

Keywords: packaging, image packaging, client perception, information

THE ANCIENT CROP OF QUINOA FOR WORLD FOOD SECURITY

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The growing interest in old food crop such as quinoa (*Chenopodium quinoa Willd.*), is based on their nutritional value, high adaptability to different pedoclimatic conditions and remarkable yields. Quinoa belongs to the family of Chenopodiaceae and it is classified as a pseudocereal. It is an Andean region native food plant dating back to 5000 years AD. Quinoa is an annual strong herbaceous plant, among over three thousand varieties (both cultivated and wild) the most utilized is the Real quinoa, mainly in the brackish areas of the Salar, in the Oruro and Potosi regions. The Incas and other earlier cultures appreciated quinoa high nutritional value, including its leaves and seeds in their diet in order to balancing the lack of animal proteins. Quinoa seeds are gluten free, therefore valuable for celiac diet, rich in protein (14-15%) primarily lysine (5-6 g per 16 g N), in minerals (calcium, magnesium, iron, copper, and zinc) and in vitamins. Quinoa seed oil (4-8%) has a high content of oleic (24%) and linoleic acid (52%) and also a significant % of squalene. Furthermore quinoa is also an excellent source of starch useful in several food and no-food applications (cosmetics and pharmaceutical) because its seeds are small starch granules with low amylose content. Quinoa is also a good source of trimethylglycine, a substance with DNA protection, anti-aging and anti-cancer action. Today quinoa is currently grown in Bolivia, Peru, Argentina, Chile, Colombia, Ecuador and also in Finland where its cultivation gave evident positive adaptation results. The first two countries are the main producers and their 2012 total production was approximately equal to 82,500 t. Due to nutritional, economic, environmental and cultural value of quinoa the United Nations (ONU) has declared 2013 as the “International Year of Quinoa” in order to remark its role as world food security crop. The objective of this paper is to analyze quinoa characteristics and to evaluate its potentialities in rural and urban food market.

Keywords: quinoa, pseudocereals, lysine, gluten free

THE EUROPEAN ECOLABEL FOR TOURIST ACCOMMODATION IN ITALY: AN EXPLORATORY STUDY

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Among the existing voluntary initiatives that a business may implement to contribute directly and indirectly to the efficient use of natural resources and to the environmental protection, formal certification schemes concerning products or services are the ones that may guarantee a defined framework for an official recognition of the environmental commitment to a continuous and sustainable improvement. However, particularly in tourism sector the eco-labels are a controversial topic as the degree to which they affect tourists' planning processes and corporate environmental performances is largely unknown. On the contrary, it is common thinking that the proliferation of ecolabelling schemes, in tourism as in other sectors, has undoubtedly generated confusion among consumers and consequently limited the effectiveness of these voluntary programs. Many studies have demonstrated that generally there is a poor public awareness and knowledge about existing eco-labels and award schemes and hence an incorrect or incomplete understanding of their meaning. The introduction of the EU Ecolabel, aimed to promote products (and, successively, also tourism services) with reduced negative environmental impacts, was intended both to propose to the market a common reference standard for the European State members and to ensure credibility of a voluntary label based on a public recognition scheme among customers and other stakeholders. The purpose of this research was mainly to address the perception issue about the advantages driven by the award of EU Ecolabel to tourist accommodation service and the main difficulties encountered by the applicants. After having considered the EU Ecolabel scheme participation experience of the Italian mountain hut-keepers in a previous work, the study was further expanded to all Flower licence-holders for tourist accommodation service, in 2013, in Italy. Also in this case, the data analysed and discussed were collected through a questionnaire designed to gather a mix of qualitative and quantitative information in January 2014.

Keywords: Environment, sustainability, EU Ecolabel, Tourism accommodation service

A STUDY ON CONVERGENCE EDUCATION PROGRAM DEVELOPMENT TO BUILD UP CREATIVE PERSONALITY: FOCUSED ON “MAKING SMART DEVICE” PROGRAM FOR SECONDARY EDUCATION

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As the world entered the 21st century, convergence times, today we need people with creativity problem-solving ability, both flexible thinking and emotional. In recent years the importance of education program connected Science and Art is being emphasized to better deal with economy and industry trend that integrate the humanities and cutting - edge technology. So providing various education courses need to carry out creativity problem – solving ability and personality which can live with other members. For this study, we pioneered the concept about convergence education program for increasing creativity and personality and explored the effect of design convergence education program on creativity and personality through taking the development of art education resource used a lot in the spot of education. We drew a core competence on this study educational- solving method to future needed people with creativity and personality to a future society and came up with convergence class model through the core competence the combination with science and design to education method. Like this, finally we proposed “Making Smart Device” program on the basis of developed contents and theoretical exploration and tested that program validity through simulation teaching.

Keywords: creativity, personality, convergence, design, education

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SELF-DEVELOPED OR STANDARIZED QUALITY MANAGEMENT SYSTEM? A CASE STUDY OF GINO ROSSI S.A., POLISH SHOE PRODUCER

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A possible way for companies to win a prominent market position is to work towards higher quality standards and, more importantly, to achieve broad public recognition. Answer for this need can be ISO 9001 quality management system which is unanimously considered the most popular, recognizable and trustworthy. However, is this certification really that crucial and indispensable? Could the same aim be achieved by using individual quality management system tailored to particular company conditions? The following article delineates a certain aspect of this issue, calling for a wider discussion. Our case study is Gino Rossi S.A., a polish leather shoe designer, producer and distributor. It is a strong, well-known brand, considered luxurious in Poland and Eastern Europe. In order to elevate company standards and enhance quality system, in 2007 the Gino Rossi management decided to introduce TQM according to ISO 9001. However, the idea was abandoned. The main reasons cited were great load of paperwork, high costs of initial phase and structural rearrangement which might have influenced labor relations detrimentally. The internal quality management system, which has been worked out and constantly updated during the company's existence, covers every single stage in the production process appeared to be sufficiently effective or even advantageous compared to the proposed norm. This article analyzes the specific quality procedures employed by Gino Rossi. The research is based on personal observations conducted in the company, along with a scrutiny of relevant documents. Furthermore, surveys regarding satisfaction with Gino Rossi products were distributed among a hundred customers. The surveys' main goal was to establish how the level of customers' expectations fulfillment relates to the level of Gino Rossi internal quality management system efficiency. The obtained results confirm that Gino Rossi choice regarding its quality development was valid.

Keywords: quality, management, ISO 9001, customer satisfaction

THE ANALYSIS OF SENSORY PROPERTIES – THE CASE OF SELECTED FACE MOISTURISERS

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Cosmetics represent a diverse range of products used by consumers in their every-day lives. These products are generally available. Face creams are cosmetic products that are applied directly to the skin, so their composition and health safety are of key significance. Moisturising creams are mainly O/W emulsions. Their main task is to restore proper water management of the skin, i.e. maintain appropriate humidity and water content in the tissues. Moisturising creams are designed for day and night use. The paper presents an analysis of the sensory properties of face moisturising creams based on the conducted survey. The survey focused on consumer preferences, enabling the authors to select sensory quality attributes and define the brands and types of products. The sensory analysis tested such properties as absorption, ease of use, greasiness, consistency and fragrance. Sensory impressions determine consumers' buying decisions. The analysis also assessed consumers' opinions concerning the packaging of face moisturisers. The further analysis assessed the impact of prices, referring them to the tested parameters.

Keywords: cosmetics, cream, sensory tests, survey

THE INNOVATIVE CHARACTER OF NANO PRODUCTS IN CONSUMER REVIEWS

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Nanotechnology is one of the most dynamically expanding fields of science in the modern world. Its interdisciplinary nature allowed creation of innovative products that revolutionize consumer market on daily basis. The manufacturing process based on the use of nanoscale resulted in development of products with previously unknown properties. The rapid increase in nano products market in recent time indicates a necessity to examine the opinion of consumers in this regard. The results of such analysis, with special emphasis on the attitude of Polish consumers toward nanotechnology and its nano products, have been presented in following essay. Correct is the statement that certain factors of consumer behavior have significant impact on the choice of product. The opinion of 300 randomly selected consumers' had been examined. The study group geographical area includes Polish Tri – City (Gdansk, Gdynia, and Sopot) and surrounding areas. Studies have proved the existence of strong social barrier toward innovative character of nano products. One of the main factors contributing to this situation is related to the basic level of knowledge and consumers awareness related to nano products' market. Respondents have apparently positive attitude toward nano products and nanotechnology. Despite the declaration of a positive attitude, their purchasing choices are cautious, and show their social resistance on innovation. It can be assumed that this position could change with the knowledge increase about the products as a result of introduction of public information campaign. In the opinion of consumers surveyed in this study, there is a clear economic barrier that restricts the purchase of nano products. Although, adjustment of prices to reflect consumers financial capacity could become a leading factor of increase of interest of these products and to break the barrier of fear of innovation.

Keywords: nanotechnology, innovation, product, consumer opinion

ENERGETIC AND ENVIRONMENTAL PLANNING: THE CASE OF THE CITY OF SASSARI

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The European Commission encouraged the *Covenant of Mayors* initiative in January 2008 as part of the second edition of the "European week for sustainable energy". The medium addresses directly the mayors of member Countries. They are invited to undertake to fight against climate change by fostering energetic and environmental sustainability on a local range. Energetic and environmental planning on a town scale aims to coordinate all of the actions needed to: reduce energy consumption; promote the production of renewable energy; reduce carbon dioxide emissions in the atmosphere. Local authorities, deciding to join the *Covenant of Mayors* voluntarily, commit themselves to reduce carbon dioxide emissions generated in their district by 20%. Working for a sustainable energy policy brings several benefits to the environment. Firstly the reduction in the use of fossil fuel causes the reduction of climate-changing gases and atmospheric pollutants - the former being the main reason of the greenhouse effect, and the latter being extremely harmful to human health. Moreover, a desirable "green revolution" on a local range would bring several direct tangible economic benefits such as the reduction in the energy spending of local governments, families and businesses as well as new economic opportunities to develop green technologies. Consequently, a new energetic approach could play an important role to face the global economic crisis. Additionally, perfecting the cities' energy efficiency is an essential strategy to fulfill Kyoto Protocol's goals and to keep global warming increase below 2°C in the long term. This research aims to identify overviews and objective details on the territory's peculiarities, in order to plan a sustainable and efficient energy usage in the district of Sassari.

Keywords: sustainable energy governance

THE APPLE JUICES MARKET– CONSUMERS BEHAVIOUR AND SENSORY ACCEPTANCE

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In Poland, in the past few years, the production of juices and nectars is the most dynamically developing branch of vegetables and fruits processing. This is a very promising industry. The assortment of nectars, juices and beverages, including functional products, offered by manufacturers is constantly expanding. Therefore, from a wide range of different apple juices offered in retail, consumers should choose those little processed, such as natural turbid juices due to their high nutritional value and health properties. However, the consumers choices depend mostly on their habits and the sensory properties of the product. The aim of the study was to evaluate consumers behaviour on the apple juice market and to examine their sensory acceptance of selected apple juices available in retail. First part of the research consisted of a survey on drinking habits of 100 students from the University of Warmia and Mazury in Olsztyn. In the second part, the same group took part in the consumer acceptance assessment of three selected apple juices (1-reproduced from concentrated juice, pasteurized; 2-freshly squeezed, unpasteurized; 3-pressed, pasteurized) using 9-point hedonic scale. The conducted survey showed that the evaluating group of consumers very rarely drink apple juices. More than 60% declared that they drink juices only twice a month or even less. The main reason for that is students low income and relatively high prices of these products. What's more, only 12% of respondents buy juices for health reasons. In turn, the results of consumer sensory acceptance survey presented that the most widely accepted apple juice was the one reproduced from concentrate, which received an overall rate of sensory acceptance at 6.5 in the 9-point scale. In the second place was the freshly squeezed juice (6.20). The pressed juice was the least accepted (5.20) due to unsatisfactory clarity and color. Based on the obtain results it can be stated that respondents did not appreciate the health benefits of fruit juices, which may result from their still little knowledge on this subject. They liked the natural and pleasant taste and aroma of freshly squeezed apple juice. However, due to the habit of drinking clarified juices with intense color, they choose juices made from concentrate instead of fresh turbid ones.

Keywords: apple juice, fresh turbid juices, functional food, sensory acceptance, consumer behavior

TRACEABILITY ASSURANCE IN THE PRODUCTION OF FRUIT AND VEGETABLES

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Food crises in the 90s last century caused changes in EU food law and obligation to introduce a traceability system in the food chain. The traceability is defined as the ability to trace the history, application or location of the subject of consideration. Thus, considering the product, it may concern the origin of materials and parts, the history of manufacturing, distribution and location of the product after delivery. Nowadays the traceability, including the use of the principles of GHP, GMP and HACCP system, is an important element of the system to ensure food safety in the European Union. The aim of the study was to present the issues of the traceability in food production. Taking fruit and vegetable sector as an example, the legislative requirements for horticultural farms related to ensure the traceability were indicated, and a model of traceability system in the production of fruits and vegetables was developed. The model enables the traceability of materials for produce and production history. It takes into consideration the whole process of production of fruit and vegetables starting from the plantation establishment and on harvesting and post-harvest stages ending. The importance of information, not only about how to perform procedures in the technological process, but also the means of production that were used, including labor, was highlighted. In the next model, the type of data collected at all stages of production in the horticulture farm and created documentation were taken into account. This information may help a producer to prove to the competent supervisory authorities, preservation of legal provisions and principles of good agricultural practice, and if necessary, to identify the source of the problems. Gathered information should be used to make decisions in the current farm management and production planning in subsequent production periods. It should also be updated on a regular basis, especially when there are changes in the rules of law and directions in products disposal.

Keywords: traceability, safety, primary production, fruits and vegetables

BUSINESS PROCESS ORIENTATION - EMPIRICAL SURVEY RESULTS

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The purpose of this paper is to present the survey results concerning BPO maturity measurement of selected Polish organizations as well as to show results of the comparative analysis between companies from Poland, Serbia and Ukraine. The paper is based on a literature review and on empirical comparative analysis. The questionnaire is a basic research tool used in the survey. The collected data were analyzed using Excel software. In 2012 the survey was conducted in Poland and also spread to the organizations from abroad. In first step - except organizations from Poland (2012) - were researched organizations from Serbia (2012) and then also organizations from Ukraine (2013). The 5-point Likert scale was used. The survey results indicate that the maturity of business process orientation in Polish organization is still on the average level. There is also the indication that the international differences are insignificant in the overall assessment because all average scores oscillate between 3 and 4 points on the 5-point Likert scale. International comparison showed that average overall rating of BPO maturity oscillates around 3 and 4 points, which seems to be typical not only for national organizations, but also for those from abroad. The results are limited to surveyed samples. The results and conclusions do not apply to whole population of organizations in Poland, Serbia and Ukraine. The paper underlines the international dimension of measurement of Business Process Orientation maturity. The results showed that the overall assessment of BPO maturity level is very similar in scores although concerned various organizations from different countries. In the paper was used one way of BPO maturity measurement by applying the evaluation of the average values.

Keywords: Business Process Orientation (BPO), BPO maturity, process maturity, measurement

INTELLIGENT PACKAGING FOOD – RESEARCH AND DEVELOPMENT

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Packaging also fosters effective marketing of the food through distribution and sale channels. It is of the utmost importance to optimize the protection of the food, a great quality and appearance - better than typical packaged foods. In recent years, intelligent packaging became very popular. Intelligent packaging is becoming more and more widely used for food products. Application of this type of solution contributes to improvement of the quality consumer life undoubtedly, the consumer. Intelligent packaging refers to a package that can sense environmental changes, and in turn, informs the users about the changes. This packaging systems contain devices that are capable of sensing and providing information about the functions and properties of the packaged foods. Also, this paper will review intelligent packaging technologies and describe different types of indicators (time–temperature indicators, freshness indicators).

Keywords: intelligent packaging, time–temperature indicator, freshness indicator

APPLICATION OF MULTILAYER POLYMER FILMS FOR PACKAGING MICROELECTRONIC DEVICES AND EQUIPMENT

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The surface of the metal, microelectronic device and equipment require special films for protection both in interoperation period of their manufacturing, during storage, transportation and exploitation. The cheapest and more accessible methods of provisional and long-term protection of such consumer goods are the use the packaging elements as the carriers of inhibitors for slowly corrosion processes. However, the influence of such modifying application spreads not only to the products for which they are intended, but on the packaging material itself, which can lead to loss of its protective properties. The best use in packaging of modifying inhibitor-containing materials of multifunction action lead to high values of quality anticorrosion protection and highest barrier characteristics, which prevent environmental pollution. Such properties are primarily show multilayer composite films. The structure and physical-chemical properties of multilayer polymer films whose composition included modifying components - inhibitors, plasticizers, fillers, were manufactured by co-extrusion (double-layer films) or by sticking together individual layers. For the inside layer of the coatings used polyethylene films by low density (PELD), which were modified by inhibitor of atmospheric corrosion and plasticizers. The external layers were of polystyrene or polyethyleneterephthalate. Investigation of the microstructure of the surface of polymer films was carried out at the electron microscope EVO40XVP. Oxygen permeability was determined by the value of current sensors oxygen depolarization which was placed under the polymer film. The films, which contained an inhibitor of corrosion in the composition, are characterized by reduced index of permeability. It has been found that more active structure changes in protective films are proceed during initial 3 years of atmospheric ageing. Plastifying and inhibited films have consistently good results during 5 - 6 years of operation. The double-layer coating observed consistently low index of permeability throughout the all period of exploitation.

Keywords: double-layer polymer films, oxygene permeability, structure

STUDY ON THE ACCESSIBILITY OF CONSUMER ATTITUDES TOWARDS THE ATTRIBUTES OF TOILET SOAP PERCEIVED IN A PURCHASING SITUATION

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In the situation of low cognitive involvement, purchasing decisions are made by consumers basing on the automatic processing of information. The attitude towards the product value is then formed on the basis of situational factors and attributes of the product towards which consumers have attitudes of high accessibility. The object of the study was to identify the above-mentioned attributes for the packaged toilet soap. It was achieved during a two-stage study, using a method of testing accessibility and classification of attitudes, developed in the Department of Quality Management at the Warsaw School of Economics. As a result of the first stage of the study it was found that the attribute of packaged toilet soap that evokes in consumers attitudes of “very high” accessibility is the packaging. The perception of the product value is significantly affected by packaging evaluation. The object of the second stage of the study was to find out which of the attributes of the toilet soap packaging evokes the highest accessibility of attitudes. The subject of the analysis was the perceived value of the packaging defined by the following dimensions: colour, lettering and symbolism, price and brand of the soap represented by its logo. The initial hypothesis was that “the attribute of the toilet soap packaging that evokes the easiest forming of attitudes is the dominant colour”. The results of the study do not confirm that hypothesis, showing that the only attribute of the toilet soap packaging towards which consumers show very high accessibility of attitudes is the brand, represented in the packaging by its graphic sign (logo). Consumers presented low attitudes accessibility towards price of the soap. In consequence, it was acknowledged that in case of the packaged toilet soap consumers make purchasing decisions based first and foremost on the soap brand logo.

Keywords: packaging, attitude, consumer, brand

INDUCED AUTOLYSIS AS A WAY TO IMPROVE THE QUALITY OF LUPINE PROTEIN PREPARATIONS

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The methods of food biotechnology are now widely used for directed modification of plant proteins and inactivation of anti-nutritional substances which they contain. By use of method of induced autolysis of plant proteins the own proteolytic enzymes of plant raw materials are activating, and this reproduces native process which occurs in the seeds during germination. By induced autolysis the own hydrolytic enzymes of the seeds are activated by action of an external inductor. The essence of our method is in initiation of enzyme system by means of proteolytic primer, an acid protease, that imitates the action of key endogeneous enzyme synthesizing de novo at the moment of beginning of germination. We have scietifically substantiated the technology of directed modification of protein preparation from lupine seeds. The kinetics of induced autolysis process was studied, we have found optimal technological parameters of this process. The duration of this process was also optimized. The modification of lupine flour by induced autolysis allows to eliminate the imperfections of taste and aroma (“bean-taste”), due to inactivation of lipoxygenases. It was established that autolysis leads to the hydrolysis of complexes between polypeptides and cellulose, and this causes the eliberation of access of digestive enzymes to their substrates. As a result, the degree of protein digestion increases, the partial hydrolysis of reserve globular proteins and polysaccharides occurs, and these processes lead to the increase of functional properties of the flour. Modified lupine flour contains more vitamins of B-group and tocopherols, and the content of antioxydants in it increases more than twice as much. The content of anti-nutritional substances – raffinose polysaccharides and phytates – decreases significantly, and the degree of potential mutagenicity does not increase. All our data obtained allow to establish that consumer properties of modified lupine flour make it a competitive analogue of soybean flour.

Keywords: lupine, protein, soya, induced autolysis

INTERACTIONS BETWEEN TEA (*CAMELLIA SINENSIS*) EXTRACTS AND ASCORBIC ACID AND THEIR EFFECT ON PH-DEPENDENT ANTIOXIDANT ACTIVITY

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The aim of the study was to determine the type of interactions between ascorbic acid and black, green, red and white tea extracts, influencing their antioxidant activity at various pH values. Antioxidant activity of tested extracts and their mixtures with ascorbic acid was measured using the TEAC method at the pH range from 2.0 to 9.0. Mixtures of ascorbic acid and extracts were prepared in several different weight ratios. The type of interaction was determined by interaction indexes and isobolograms. The TEAC values of mixtures with high concentration of tea extracts were pH-dependent and they were increasing with the increase of the pH. For mixtures containing high concentrations of ascorbic acid, antioxidant activity of mixtures was unaffected over the whole pH-range. Interaction analysis using isobolograms showed that all tea extracts acted additively with ascorbic acid.

Keyword: tea, ascorbic acid, interactions, antioxidants, pH profiles

INNOVATIVE ACTIVITY AND ECO-INNOVATIONS IN THE LIGHT OF PRO-ENVIRONMENTAL STRATEGIES

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In the modern economy relied on knowledge, innovations become a key driver of economic growth and allow enterprises to maintain a competitive advantage. In contemporary times R&D, new technologies, innovativeness, entrepreneurship became an indicator of modernity having a significant effect on company's ability to exist and survive in the market. The term 'innovation' is understood as launching a new or essentially improved product (good, service) or process, new organizational method or new marketing method in economic practice, workplace organization or environmental relationships. Eco-innovation is a specific case of innovation that includes any new technology, process, product/service that may improve environmental protection or contribute to more effective and rational use of resources. Innovative activity includes all scientific, engineering, financial and commercial activities aimed at or intended to bring innovations. Some of these activities are innovative, while other may be not a novelty but are necessary for implementing innovations. Currently the knowledge-based economy becomes the main condition of permanent economic growth. An assessment of the most developed OECD member countries indicates that companies invest comparable money in intangible assets and intellectual property related to innovations (R&D, organizational skills, know-how, software, brands) as those of conventional investments such as machinery, hardware and buildings. Eco-innovativeness based on extensive scientific researches, especially in modern disciplines of knowledge, is a key factor determining economic growth. It is also an important element of ecological policy conducted within the scope of numerous pro-environmental global and EU strategies such as „Europe 2020 - A strategy for smart, sustainable and inclusive growth”, „OECD Green Growth Strategy – GGS”, „Global Green New Deal – GGND” and „Strategy for Environmental Technologies”. The aim of this paper is to demonstrate a stimulating role of these strategies in the process of implementing eco-innovative technical, technological, marketing and organizational undertakings to develop environmentally friendly processes and products.

Keywords: innovative activity, eco-innovations, pro-environmental strategies

PRODUCT INNOVATION MANAGEMENT VIA PATENT LANDSCAPE

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Successful companies know that bringing innovative new products to market is a key enabler to besting competitors and driving future, sustainable revenue. Companies must be cognizant of mitigating the risks associated with the loss of intellectual property during developing of the product as well as product developers must also be cautious when embarking on new product development projects not to infringe upon other's IP. Manufacturers are lessening the risks through the use of product lifecycle management (PLM) systems. To lessen their risk, companies, prior to launching a new product, and often even prior to initiating a new line of research that may lead to the development of a new product, need to seek to secure a "freedom to operate" (FTO), which ensures that the commercial production, marketing and use of their new product, process or service does not infringe the intellectual property rights of others. This all begins by searching for patents issued or pending patents and obtaining a legal advice on whether a product may be considered to be infringing existing patent(s) owned by others. A patent landscape analysis is an invaluable tool which allows business to strategically direct research and development toward the open spaces in the patent landscape, avoid competing patent activity as well as make decision on investments when so called "sweet spot" is reached on the patent landscape. In the publication the literature patent landscape reports depicting the development of graphene and nanotextiles will be described as well as results of own patent landscape analyses taken for an oxygen scavengers will be presented. The results of patent landscape analysis turned out to be helpful at the decision making about the commercialization of patented oxygen scavengers based on the nanoiron.

Keywords: product lifecycle management, patent landscape analysis

LIFE CYCLE INVENTORY ASPECTS OF INTERNAL TRANSPORT – OPERATION OF THE FORKLIFTS FITTED WITH INTERNAL COMBUSTION ENGINES

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Internal transport is an important area of activity for many companies, regardless of their size and profile. There are many examples of LCA analysis regarding various aspects of transport, but they relate to the external transport. There are only single reports on the analysis of LCA relating to the means of internal transport. For that reason it was decided to gather inventory data related to the operation of selected forklift trucks, as the most commonly used means of internal transport. For the measurement of harmful exhaust gases the mobile device SEMTECH DS was used. It belongs to the PEMS group (Portable Emissions Measurement System), which allows measuring the concentration of carbon dioxide (CO₂), carbon monoxide (CO), nitrogen oxides (NO_x = NO + NO₂), total hydrocarbons (THC), and oxygen (O₂). All measurements of the emissions of the harmful exhaust gases from the internal combustion engine forklifts were carried out on the open space in front of the warehouses. They were made in a short period of time (September/October 2013) and in comparable weather conditions. The inventory tables prepared for drives with and without load.

Keywords: forklifts, fuel consumption, emissions, LCA

THE STUDY OF BIOINDICATORS AS A PROXY OF ENVIRONMENTAL POLLUTION

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An increasing amount of chemical contaminants in the environment, caused by industrial and agricultural activities, contributes to changes in both abiotic and biotic ecosystems. Due to a high cost of many analytical techniques, mostly related to high costs of analytical equipment, including its maintenance, and lack of existing infrastructure, it is very difficult to determine all of the contaminants present in air, soil, and water. A lot of information can be obtained by analyzing the impact of pollutants on living organisms. One of the organisms highly reactive to pollutants are green plants, especially evergreens, which absorb chemical compounds from the air throughout the year. The most sensitive biomarker of green plants is chlorophyll, which is involved in photosynthesis. A decrease in the amount of chlorophyll is related to the amount of pollutants absorbed by the plants from the air. A reduction in the amount of chlorophyll in plants leads to a decrease in the fluorescence intensity of the acetone-extracted chlorophyll. This article presents a fluorescent method based on the measurement of the intensity of chlorophyll fluorescence, which are complementary to the physicochemical analyzes of environmental samples. Comparative measurements of chlorophyll fluorescence spectra of *Thuja Accidental*, collected in the province of Malopolska (Poland) were conducted, with a clear distinction of the samples taken in the center of the urban agglomeration of Krakow, Poland. The method of chlorophyll fluorescence of plants exposed to environmental stress allows for a fast comparison of an overall air pollution such as dust and smog in any location. This method is not limited to *Thuja Accidental*, and can utilize a large variety of plant species.

Keywords: bioindicators, chlorophyll, environment, pollutions, fluorescence

THE IMPACT OF PRAXEOLGY ON QUALITY MANAGEMENT

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Total Quality Management (TQM) emerged thanks to the theoreticians and practitioners involved in the second half of the 20th century, especially Edward W. Deming. Few people realize the extent of the influence over this area exerted by praxeology, i.e. the study of human conduct. One of the co-founders of the latter was Tadeusz Kotarbinski, without a doubt, one of the greatest Polish philosophers of the 20th century. In this paper, I am attempting to show that many of Kotarbinski's thoughts are simply more concise and a deeper analysis than that which lays at the foundations of both TQM and ISO 9000-series standards.

Keywords: TQM principles, praxeology, usefulness and purposefulness, management principles

FOOTWEAR CARBON FOOTPRINT IN FOOTWEAR INDUSTRY (CO₂Shoe)

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The carbon footprint is an environmental indicator that is used to measure the total sets of greenhouse gas (GHG) emissions to the atmosphere caused by a product, service or organisation throughout its whole lifecycle. The greenhouse effect is a natural phenomenon by which the so-called GHG, which are part of the atmosphere, absorb and emit infrared radiation, thus resulting in an elevation of the surface temperature of the Earth. While the main greenhouse gas is carbon dioxide (CO₂), there are other GHG, such as: methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFC), perfluorocarbons (PFC) and sulphur hexafluoride (SF₆). CO₂, being the most common and widely-known gas, is used as a reference gas in the studies of the greenhouse gas effect. There is currently a broad spectrum of methodologies for the calculation of the carbon footprint of products (more than 40 different methods), which account for the large differences observed in the results obtained according to the methodology employed and the impossibility to compare such results. Faced with this situation, as well as the fact that there is no specific methodology for the calculation of footwear carbon footprint, the LIFE CO₂Shoe project was launched, which aims to create a carbon footprint calculation tool specific for the footwear sector. Such tool will allow the measurement of GHG emissions produced by each pair of shoes. The use of this tool will allow the identification of those footwear manufacturing processes having greater impacts so as to be able to implement strategies aiming to reduce the environmental impact of the end product. This paper presents the work carried out in the European project CO₂Shoe “Footwear Carbon Footprint”, that is co-funded by the European Union through the LIFE+ programme.

Keywords: carbon footprint, footwear industry, CO₂, Kyoto protocol

COMBINED TECHNOLOGICAL, ENVIRONMENTAL AND ECONOMIC CONSIDERATIONS IN GREY WATER REUSE VIA ANALYTIC HIERARCHY PROCESS (AHP)

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An optional solution of using water more efficiently is to reuse greywater. Greywater originates from washing sinks, showers and laundry which compose 40% to 50% of water consumption in household (without water from kitchen sinks and dishwasher). This paper examined the technology, environmental and economic aspects of greywater reuse and consists of three phases. The project compares four alternatives of greywater reuse systems using different techniques as wetlands, membrane purification and water diversion devices. These systems reuse the greywater for garden irrigation, toilets flushing or for both. On the second phase an alternatives comparison was conducted using AHP (Analytic Hierarchy Process) model. A pair wise comparison was conducted and the best alternative (34%) revealed a system for both garden and toilets flushing. On the third phase a sensitivity analysis was conducted. The multi-objective AHP method is an excellent and practical tool for project evaluation. It allows to take a sample of people with different opinion and from various disciplines and then to select the preferable project development. The size of the group is also a variable, although it can be left even to one subjective expert.

Keywords: greywater, Water Shortage, Reuse, Alternative comparison, Analytical Hierarchical Processes (AHP)

IS LITHIUM A STRATEGIC MINERAL? A REVIEW

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Lithium is the lightest of the alkali metals, characterized by a high reactivity and specific heat capacity. Lithium is not found in nature as a pure element, and it is included as a component in some minerals, such as igneous rocks (lepidolite, petalite, spodumene, and amblygonite), or in the natural springs and salt lakes. Lithium and its compounds possess particular features, which make them adapted to many commercial and industrial applications, such as ceramics, glass, aluminium, lubrication industries, and pharmaceuticals industries. Thanks to the particular properties, in the near future, lithium is expected to play an increasingly role in the energy sector and high technology flanking the rare minerals earths for strategic importance in the post-oil era. New energy policies adopted by European Union level and internationally will boost the status of lithium and its applications. The industrial sectors more interested into the technical innovation of this metal are the following: rechargeable batteries in the transport sector, as well as tablets and smartphones and the storage, and distribution of electrical energy. The first one should mainly develop the intensive production of the electric car with the aim of reducing significantly the CO₂ emissions toward the zero emissions standard. The second one should be associated with power plants producing renewable energy from intermittent nature (e.g. solar or wind energy) and to be used in local distribution networks (smart grids) of electricity. The aim of this paper is twofold: a) to review the factors affecting the demand for lithium and its supply analysing the industrial application and the production chain; b) to examine lithium sources and its future perspectives.

Keywords: strategic minerals, lithium resources, material flow analysis

FACTORS AFFECTING SELECTED WHEY PROTEINS CONTENT IN UHT MILK

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Milk is a product of a very complex, which consists of about 250 components. The most important of them are fat, protein, lactose and minerals. Milk protein content ranges from 3,05% to 3,85%. Its fraction is divided into casein and whey proteins, of which: albumin (α -lactalbumin, β -lactoglobulin A and B blood serum albumin), immunoglobulins, However, a number of factors will change the content of these compounds in milk. The aim of the study was to evaluate the influence of selected factors such as fat content, temperature and storage time on the content of selected non-denatured soluble at a pH of 4.6 - 4.7 whey protein (α - lactalbumin, β - lactoglobulin A and B) in commercial UHT milk. The experimental materials comprised commercial UHT milk aseptically packaged in 1 liter cartons from the same supplier. Experimental samples were collected from three different batches of UHT milk 0.5% fat content, as declared by the supplier, and from three different batches of milk 3.2% fat content. The results of the study indicate that in UHT milk 0.5% fat content directly after production was the largest concentration of α -laktoalbumina, β -laktoglobulina A i B respectively, 0,151% 0,122% and 0,098% on average. Moreover, the study showed that the content of selected whey proteins in 3,2% fat milk was statistically differ from it content in 0,5% fat milk. The results of the tests showed that after 6 months of storage the concentration of all tested whey proteins decreased in all samples of UHT. Reducing the concentrations of the different whey protein fractions were statistically significantly higher in milk stored at $22\pm 2^{\circ}\text{C}$.

Keywords: quality of UHT milk, α -lactalbumin, β -lactoglobulin

THE QUALITY OF TRADITIONAL AND CONVENTIONAL MEAT PRODUCTS

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Among traditional products, processed meat products are of particular interest to consumers. The aim of this study was to compare the quality of traditional processed meat products included in the list of traditional products, processed meat products declared by their manufacturers to be traditional and conventional processed meat products – large-scale production. The subject of sensory and chemical tests were processed meat products belonging to the two groups of hams and sausages. Two products of three manufacturers were selected for the study. They were the products of companies A, B and C. Products of the first manufacturer (ham - A1 and sausage A2) were added to the list of traditional products of the Ministry of Agriculture and Rural Development. Products from the B manufacturer (ham - B1 and sausage - B2) are products with the word *traditional* included in their name, but are not included in the list of traditional products. Products from the C manufacturer (ham – C1 and sausage - C2) are conventional products. On the basis of the study the following conclusions have been formulated: Organoleptic characteristics of traditional processed meat products and those declared to be traditional are similar. Conventional products have slightly worse organoleptic quality than traditional products. The chemical composition of traditional and conventional processed meat products are significantly different. Favorable chemical composition exists in the case of traditional processed meat products. They contain significantly more protein than conventional processed meat products. There are no significant differences in the chemical composition of traditional processed meat products and those declared to be traditional. Traditional products contain less phosphorus in their composition than conventional products. Not all of the products available on the market meet their requirements.

Keywords: traditional food, meat products, quality

ECO-INNOVATIONS FOR SUSTAINABLE DEVELOPMENT OF CITIES AND HUMAN SETTLEMENTS

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The term “eco-innovation” is understood as a change in production and consumption patterns and developing technologies, products and services that reduce the environmental footprint. In this context there are numerous ties between eco-innovations and sustainable development. In this paper the application of the principles of the “One Planet Living” program to selected eco-innovative solutions for sustainable cities and human settlements is presented. The designing areas that foster green innovativeness, thus also contribute to the achievement of sustainable development are shown. They stimulate technical, technological, marketing and organizational activities in selected model solutions. To assess eco-innovative settlement units developed according to the One Planet Living principles BedZed and One Brighton communities in the United Kingdom were chosen. The One Planet Living principles mentioned above were implemented when building and developing these pilot projects. They may be model solutions both for newly designed communities as well as for revitalisation of the existing ones. One Brighton’s Life Cycle Assessment was carried out by an eTool Office’s interdisciplinary team. The results of LCA for CO₂ emission index expressed in kg/occupant/year for variant solutions used at One Brighton indicate 60% reduction of greenhouse gas emission compared to typical existing housing. In summary one can conclude that LCA covering greenhouse gas emission index only as CO₂ equivalent for One Brighton and comparing it with typical housing is fully reasonable. This results from the One Planet Living and One Planet Communities programmes that require from all EU member states CO₂ emissions to be reduced almost to zero by 2020.

Keywords: Eco-innovation, One Planet Living Program, Sustainable Development of the Cities and Settlement, LCA

IMMIGRANT ENTREPRENEURSHIP - A CHALLENGE TO COMMODITY SCIENCE IN THE AGE OF GLOBALISATION

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Even if it is one of the oldest form of human demographic mobility, in the age of globalisation migration represents a quite controversial phenomenon, with lots of implications in various areas such as economic, social, political, etc. and at all territorial levels. Considering this, during the last periods of time, migration represented and it still represents a key subject on the agenda of policy makers, public authorities, etc. and, in the same time, an important research area for scholars. Research on the migration phenomenon is quite vast and in different directions such as demographic, economic, social, etc. or even in multidisciplinary directions. Through this paper, we aim at providing a different view on the analysis of the migration phenomenon from economic perspective, focusing on commodity related issues. Our major goal is to investigate and to highlight the impact migration has on the supply of commodities in the country of destination. In this regard, we carried out an interview-based research among Turkish immigrants in Romania that own businesses active in the bakery industry in Bucharest. Among other immigrant entrepreneurship related aspects, the research revealed that migration impacts the supply of commodities in the country of destination. More precisely, the interviewed Turkish immigrants owners of enterprises active in the bakery industry played an important role in the diversification process of the supply specific to this industry on the Bucharest market, mainly through the introduction of new products with ethnic character. Furthermore, starting from the main results and information outlined in the present paper, we aim at providing a series of directions for further research in the area of migration's impact on the supply of goods in the country of destination and to provide a different approach to immigrant entrepreneurship research, mainly taking into consideration its connexion and impact on the commodity science.

Keywords: migration; entrepreneurship; immigrant entrepreneurship; supply of commodities; bakery industry

EDUCATING DIPLOMATS IN COMMODITY SCIENCES AT THE K. K. CONSULAR-ACADEMY

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In September 1942 the Consular Academy moved to the site of the University for World Trade, and thereby the equipment, the storage and the collections of scientific study materials were transferred. The former Oriental Academy was founded in 1754 on the basis of an Imperial Order by empress Maria Theresia. The Academy's initial purpose was to enhance Austria's position in the Balkans and the Near East by improving the nation's trade and cultural relations. The curriculum emphasized oriental languages such as Persian, Arabic and Turkish as well as political sciences and general sciences in order to educate diplomats and merchants. The offered courses were enlarged with commercial education, product technology and industrial engineering science. In Addition field trips were organized to trading companies, factories and mines. The Merchandise and Product Museum at the Consular Academy was situated in a large hall, endowed with ceiling-high display cases along the wall and display cases in the middle of the hall for direct revision. A large amount of the artefacts were preserved in glass cylinders. We are with conviction, that these classes, shown on an old photograph, are the same classes situated in the Viennese Commodities Collection at the Technisches Museum Vienna. The emergence of the well-known Collection dates back to the Vienna International Exhibition in 1873 where numerous samples and raw materials a high commercial value were collected. In 1922 the collection was transferred to the University of International Trade and Commerce. Enlarged to include 30,000 artifacts it was the largest collection of its kind all over Europe. The results of our research are supported by funds of the Oesterreichische Nationalbank (Anniversary Fund, project number: 15587).

Keywords: consular academy, educating commodity sciences, merchandise museum, product technology, industrial engineering science

THE QUALITY OF CONVENIENCE FOODS ON THE EXAMPLE OF SOUP CONCENTRATES AVAILABLE ON THE POLISH MARKET

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The fast pace of modern life determines changes in consumption. People have less time for meal preparation and that is why they often choose convenience foods. Consequently producers are constantly developing new products to meet consumers' needs and vast variety of such foods is to be found on the market. Soup concentrates are widely recognized and consumed examples of convenience food products. They are available on the Polish market for many years. Since their launch, however a lot has changed. Nowadays consumers expect food that is not only fast in preparation but also safe for their health and of high nutritional value. They also prefer products that lack in preservatives and flavor enhancers as sodium glutamate. Since soup concentrates are designed to be ready to eat after preparation consumers have limited influence on nutritional value of the meal. They have to trust producers' declarations and make proper buying decisions to balance their diets. The aim of this study was to assess the quality of soup concentrates available on the Polish market on the example of pea soups. For this purpose 8 varieties of soups from 7 manufacturers were selected. Samples were collected from four production batches. The analysis included verification of nutritional value and net weight of products with comparison to the information given by their producers, evaluation of the sensory quality of cooked soups and checking packaging's integrity. The results prove that soup concentrates available on the Polish market differ significantly with respect to the nutritional value and the sensory quality. The research revealed also that there are discrepancies between the declared contents of nutrients and their actual amounts in the examined products.

Keywords: soup concentrates, convenience food, nutritional value of soups

BIODEGRADATION OF STARCH AND POLY(ϵ -CAPROLACTONE) MODIFIED BY STARCH IN NATURAL FRESH AND SEA WATER

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Sea is a unique ecosystem with very different microbially activity and sensitivity to pollution. Thousand tones of plastics have been reported to be discarded into marine environment and river or lake waters every year. It has been estimated that one million animals are killed every year either by choking on floating plastic items or by becoming entangled in plastic debris. The development of biodegradable polymers is the key to solving the problems caused by plastic debris. Starch is a biodegradability material by different microorganisms like yeast, fungus and bacteria or enzymes: α -amylase, β -amylase or glucoamylase. This natural filler material may be incorporated into synthetic plastic matrices, like poly(ϵ -caprolactone), as a rapidly biodegradable component. Poly(ϵ -caprolactone) is an important member of the aliphatic polyester family known as susceptible to biological degradation. Degradation of aliphatic polyesters in living environments can result from enzymatic attack or from simple hydrolysis of ester bonds or both. The aim of this study is the estimation of sea water and fresh water influence on degradation process of starch and poly(ϵ -caprolactone) modified by starch. Biodegradation process of starch and poly(ϵ -caprolactone) took place in natural environment in The Baltic Sea and fresh water (pond). The characteristic parameters of both environments (temperature, pH, oxygen and salt contents) were measured during experiment and their influence on the biodegradation of the samples was discussed. The loss of weight and changes of surface morphology of polymer samples were tested during the period of incubation. The poly(ϵ -caprolactone) film modified by starch was assimilated completely over the period of five weeks in sea water, but after fifteen weeks incubation in fresh water the polymer weight loss was about 20%. Results were compared with pure poly(ϵ -caprolactone) degraded in sea water and in sea water with sodium azide (which is added into the water to eliminate the influence of microorganisms). Starch samples were more susceptible to microbiological attack in fresh water (the weight loss was 11,5% after 6 weeks incubation) than in sea water (the weight loss was 6,4% after 6 weeks incubation).

Keywords: biodegradation, poly(ϵ -caprolactone), starch, fresh water, sea water

THE IMPORTANCE OF COATING THE INTERIOR OF BEVERAGE CANS AS A MEANS OF ENSURING PRODUCT SAFETY

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The packaging industry is one of the most important and fastest growing branches of industry in the world. An increase in consumption, a need to create new trends as well as a common practice of offering commercial packaging for both food and nonfood products have all led to a gradual rise in the intensity of development of packaging industry. The best engineers in the world have been working on developing solutions for different types of packaging in order to ensure the safety of products stored in them. For the purpose of this study a standard beverage can has been chosen as a typical packaging used in food industry, for sodas and cold drinks, as well as in beer industry. Every day millions of aluminum drink cans are produced, which are then purchased by food producers to finally fill the shop shelves and be bought by individual consumers. The aim of this study was to prove the importance of painting and coating the interior of beverage cans as a way of ensuring the safety of the packaging and a compliance with international requirements and to present steps that can be taken by the producer in order to minimize the risk of defects in painting and coating the interior of cans, which in turn influences the overall quality of the food products stored in them. The research presented in this work has been performed in order to verify the following research hypotheses:

- good packaging is a multi-functional one,
- interior-layer lacquers with epoxy resin used for beverage cans are completely safe especially in terms of the food products stored inside these cans,
- the impact of the beverage can's interior coating on the product stored inside may differ, and the differences depend on the properties of the drink,
- a leak testing of the interior coating layer facilitates determining further action to be taken in order to improve the quality of the packaging,
- safe packaging contains a high quality interior coating layer.

Keywords: packaging, can, consumer, safety, quality

THE EFFECTS OF THE ENGINE OIL EXPLOITATION ON ITS VISCOSITY

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The main objective of this study was to assess the direction and intensity of changes in selected rheological properties of motor oils, which take place during engine operation, by the application of laboratory methods. The experimental material was a mineral oil Castrol Tecton, class: 15W40. The oil operated in the vehicle Volkswagen Transporter produced in 1993. This is a 4th-generation car, in which the drive unit is a diesel engine with a capacity of 2370 cm³. This engine is 5-cylinder with maximum torque of 168 Nm and power at 3700 rev./min. equal to 75KM or 55kW. Oil samples were collected and analysed at the beginning of the test and then, each time, after making another thousand kilometers. Engine oil viscosity tests were carried out on 11 samples. The study of each subsequent sample was held at constant and variable shear rate. The research was conducted with the use of a viscometer Rheotest RN 3.1. All the changes that take place in the course of the engine oil exploitation can be caused by the pollution arising from the wear of engine parts forming sludge, soot or ash. The changes in rheological properties can also be ascribed to the age and mileage of the car used in the tests. Due to the car's high mileage it is possible that the clearances between the piston and the cylinder liner affected the final results. It is also probable that the unburned fuel found a passage to the engine sump thus leading to the dilution of engine oil during operation. In order to ensure a good and long use of machines it is crucial to protect them from ageing and wear. To prevent wear and galling, the machine protection must be at the highest possible level. On the basis of the study it can be concluded that the Volkswagen Transporter engine oil was properly chosen. During the entire life cycle, the results showed only a slight decrease in dynamic viscosity. Based on the obtained results it can be stated that the oil protected the engine very well and it remained in the viscosity class specified by the manufacturer. The results indicate that the analysis of the above elements is not sufficient to fully assess the degree of degradation of engine oil. In order to make a comprehensive assessment of the quality of engine oil it is necessary to carry out more advanced studies.

Keywords: engine oil, rheology, viscosity, lubricants

SUSTAINABILITY LABELS ON PRODUCTS: CONSUMER UNDERSTANDING AND USE IN BULGARIA

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This study investigates the consumer understanding and use of environmental and ethical labels (sustainability labels) on the products. Data was collected by means of direct personal face-to-face interviews, with a total sample size of 1011 respondents. The survey was conducted in April - May 2013 in Bulgaria. Respondents expressed low levels of knowledge about the environmental concepts, sustainability labels and difficulty in the selection of the products labelled with them. Understanding of nine selected labels (EU organic production, EU Ecolabel, Fair Trade, FSC certification, Protected geographical indication, Protected designation of origin, Traditional speciality guaranteed, Energy Label and the Product can be recycled) was very limited. The results indicated a strong correlation between information about the labels and the level of education of the participants. The results imply that sustainability labels currently are not well known and efforts are required from stakeholders to create trust in the labelling of environmental and ethical products.

Keywords: sustainability labels, environmental labels, ethical labels, consumer understanding, Bulgaria

RECYCLING OF GLASS POLYESTER WASTE

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Composites such as glass reinforced polyester are popular in the marine industry but disposal methods of their waste is not solved. It is a challenge in developing methods of composite recycling to alleviate environmental effects in Poland. EU directive, 199/31/EC, prohibits the landfilling of material with more than 10% organic content, such as glass reinforced polyester waste. Potential techniques that could be in use for glass reinforced polyester waste include material, thermal recycling as well as chemical recycling. The hierarchy of waste management routes appears to give preference to material recycling. This case study was carried out on the material recycling of glass reinforced polyester waste which is shredded into smaller fragments and can be added into polyester composites with silica. The waste was introduced to the compositions in the amounts of 10, 12 and 15 wt. % of all the components. The influence of the waste on the density of the composites as well as on the compressive strengths and the flexural strengths of the polyester composites with silica was examined. It could be concluded that the adding of glass reinforced polyester waste to composites with silica causes a decrease in mechanical properties. The waste can be applied only as a filler in building materials, which do not require high strength. Specific uses of composites with glass reinforced polyester waste can be countertops, parking curbs, construction barricades, insulation material and garden ornaments.

Keywords: waste, composites, recycling

INTEGRATING ENVIRONMENTAL AND ECONOMIC LIFE CYCLE ANALYSIS IN BUILDING INDUSTRY

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Integration of Life Cycle Assessment (LCA) and Life Cycle Costing (LCC) enables to define environmental and economic aspects related to the whole life cycle of a single product or project investment. Reference books quite frequently stress the significance of eco-efficiency in building sector. Lately, it is observed that construction industry increasingly represents thinking in terms of a life cycle category and involves the idea of sustainable development into this area. This paper presents the economic and environmental dimension of chosen life cycles phases of two residential buildings that differ from one another in the technology used for their erection and the energy standards met. The main objective of the analysis is to combine the two areas together: environmental impacts generated by production of building materials and processes during a established period of building use as well as the corresponded costs. The present paper also discusses the methodological aspects of the life-cycle based technique's integration. The analysis shows that from environmental as well as economic perspective, more beneficial indicator concerning life cycle is obtained for passive house. Significant reduction of environmental impacts and costs is attributed to lower energy demand of passive building and used heating system. Results of the study emphasize the importance of thinking in life cycle criteria, because often solutions unreasonable on one stage appear to be justified in long-term perspective. From the methodological point of view, it seems that the most meaningful inconsistency between applied life-cycle based techniques concerns the process of discounting. Discounting is a required step by the procedure of LCC, however in case of LCA this approach is not recommended.

Keywords: Life Cycle Assessment, Life Cycle Costing, sustainable building industry

MEASURING THE PERFORMANCE OF SERVICE COMMODITY: LESSON FROM AVIGNON, CHUNCHEON AND GEOCHANG INTERNATIONAL FESTIVALS

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In this research the author analyzed the aforementioned two Korean service commodity presenting the different characteristics of such Korea events based on a comparison with the Avignon cultural product in terms of aspects of the service commodity which were defined as promoting globalization. Qualitative analysis was carried out through 'in-depth interviews' and focus group interviews'. Interviews were conducted from 19 Jul 2012 to 20 Jan 2014 and involved ten participants divided in two groups: 'service commodity management specialists' and 'service commodity consulting specialists'. This study analyzed the significant characteristics concerning effective management measures for local-based service commodity which encourage globalization. More importantly, the study sought to delineate the process through which this goal could be achieved. Of interest academically were the strategies for the globalization of the local community in the Avignon case. Also, the author sought to understand the present state of the overall managerial characteristics of the service commodity such as 'Chuncheon International Mime Festival' and 'Geochang International Festival of Theatre' and how they might be improved. Such results are important as they can help improve managerial and developmental paths for the many local service products around the world as they seek to become prominent global events.

Keywords: service commodity, cultural product, local globalization, festival, qualitative study

QUALITY FORMING OF WATER-DISPERSION PAINTS FILLED BY UKRAINIAN CARBONATES AND KAOLINS

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Water-dispersion paints occupy an increasing share in the structure of production and consumption of paints and coatings materials in Ukraine due to their environmental friendliness, lack of harmful solvents content, easy of obtaining coatings, tinting and other advantages compare with paints on the base of organic solvents. Fillers have significant influence on quality formation of modern water-dispersion paints. During the choice of fillers it is necessary to ensure optimal surface wetting by water dispersions of polymers, chemical and colloidal chemical compatibility with other components of the paint, good dispersion, and the rate of filling. We have already studied the properties of carbonates and kaolins of Ukrainian origin as mineral fillers. Examination was carried out in such properties as dispersion, microstructure, oil absorption value, whiteness, specific geometric surface and the BET surface, limiting wetting angle, lyophilic coefficient, effective surface area and others. The examination found that the use of Ukrainian carbonates and kaolins provides to produce the high quality water-dispersion paints. A mathematical model, which allows to determine the optimal ratio of different granulometric composition of carbonates and kaolin the most close-packed arrangement of the filler particles in the coating was create. This improves the film strength at break, resistance to wet abrasion and improve other properties. The high quality interior and exterior water-dispersion paints with Ukrainian carbonates and kaolins have been created. All paints are designed to create coatings on glass, concrete, cement plaster, wood, wallboard and other materials. The coatings have excellent adhesion to various materials, a sufficient whiteness, high flexibility, hiding power and other parameters. Paints are environmentally friendly due to the absence of organic solvents, heavy metals and other harmful substances.

Keywords: quality, commodity science examination, water-dispersion paint, mineral filler, kaolin, carbonate

BENEFITS OF MANAGEMENT SYSTEMS INTEGRATION

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The paper deals with the benefits of introduction of management systems integration which presents the improvement of the processes in the organization, the improvement of production and service quality to satisfy customer needs, the improvement of the organization efficiency, the processes clarifications and the definition of specific responsibilities. The management system integration means the linking of particular systems focused on customer, the public, employees or owners into a single unit. It is an opportunity to demonstrate its commitment to sustainable development in relation to the customer as well as in relation to the environment, to health and safety at work, to food safety, information security, etc. The organization integrates the requirements related to the fulfillment of their objectives. The synergistic effect in terms of management system compatibility and efficiency appears after the mutual integration of particular systems in the organization. The management systems integration is not a simple process. This process requires gaining the strategic synergies, strategic planning, organization culture based on the continuous improvement, the competent and committed leadership, trained and qualified employees, consultants with specialized experience, and finally sufficient financial resources. The system approach ensures the orientation in the legislative requirements and their fulfillment, and it enables to avoid particular risks in the activities of the organization. Well-built and maintained systems not only create conditions for increasing competitiveness of the organization, but also its long-term prosperity. The management systems integration will bring transparency to the organization, better work organization, defining responsibilities and powers, creation of effective tools to meet strategic goals, and also the requirements of stakeholders. The important benefit is a corporate culture development focused on the continuous improvement of quality, the environmental protection and health and safety at work which may influence the employee's loyalty and their greater engagement.

Keywords: integrated management system, quality management system, benefits, quality, environmental management, occupation health and safety system, process

CONSUMER'S OPINION ON SAFETY AND FUNCTIONALITY OF FOOD PRODUCTS PACKAGING

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Food packages are subject of constant change. The cooperation of food manufacturers and packaging industry brings a number of innovations designs. The main goal of innovation in packaging sector is to improve the functionality of packaging and increase safety of packaged products. The article presents results of studies conducted among young consumers about their preferences and knowledge about the safety and functionality of food packaging. Respondents rated the importance of packaging attributes such as: shape and size of the container, the type of packaging material, quality, aesthetics (color and design, the ability to re-close a previously opened package, easiness to open, easiness of product's use, the possibility of re-use of packaging and recyclability of packaging. Consumers also evaluated factors / packaging elements affecting the safety use of a food product like: lack of sharp edges, convenience package, the correctness of the package manufacturing, the information contained on the packaging, labelling in Brille alphabet, guarantees the integrity of the product. Examined consumers opinion relating to design solutions used in packaging such as: packaging used in package of liquid food and beverages such as bottles, multilayer materials packaging for liquid food and beverages, cans for solid food and beverage, packaging in the form of plastic bags or wraps. Evaluation as conducted in the terms of safety and functionality of presented solutions. The study identified the need to adapt the selected solutions in packaging, as not all fulfill their functions. The results can also be stated that consumers are knowledgeable about the use by food manufacturers guarantees the integrity of the packaging, as the form of safety warranties. Also confirmed that consumers prefer packaging equipped with design solutions that improve the functionality and safety of packaging and packaged products.

Keywords: food packaging, guarantees of integrity, packaging functionality, safety of use of packaged food products

THE QUALITY OF NATURAL YOGHURTS

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Among fermented beverages, yogurts are the ones characterized by high consumption. The aim of the study was to determine the organoleptic quality and basic physicochemical properties of natural yoghurts on the Polish market. The material consisted of natural yoghurts, made by twelve manufacturers, from three different batches. Thirty-six yoghurt samples were collected for analysis. Yogurts were purchased in retail in Krakow. Analyses were performed at the Department of Food Commodity Science at the Cracow University of Economics. Designations of qualitative characteristics of natural yoghurts were made in accordance with the Polish Standard PN-A-86130: 1975. Organoleptic evaluations of smell, taste, color, structure and consistency were performed using a model sheet. Physicochemical studies included determining: color (L^* a^* b^*) in the CIELAB system, with Minolta Spectrophotometer CM - 3500 d, fat content using Gerber method, dry matter content by drying in the oven, acidity by titration, pH using a pH meter. Analysis of yoghurts of different manufacturers on the market have shown differences with respect to physicochemical properties. The tested yoghurts meet the requirements for the content of dry matter and fat content and titratable acidity. It has been shown that, in some samples, fat content was not in accordance with the manufacturer's declaration set out on the packaging. Average assessment of organoleptic properties of the tested yoghurts was between 3.54 - 4.53 in a 5-point scale. The quality of natural yoghurts available on the market is at an appropriate level. Comparing the value for money of the tested yoghurts, it was found that the price of yoghurts is not always adequate to their quality. There was no distinctive highest quality among the most expensive yogurts, as well as the cheapest ones were not characterized by the lowest quality.

Keywords: fermented milk, yoghurt, quality, market

THE RELATIONSHIPS BETWEEN CONSUMPTION EMOTIONS AND RETAILER ATTRIBUTES AND PATRONAGE INTENTION: FOCUSED ON MEDIATING EFFECTS OF PERCEIVED RISK

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The objective of this paper is to find out the relationships of several antecedents such as retailer attributes, consumption emotions and patronage intention on online shopping stores. Especially, the meditated effects of perceived risk between those constructs are mainly focused on the empirical study of the Korean market. The first survey was conducted as a pretest for the main study in the university classrooms. Data from the first survey were analyzed with SPSS (Statistical Package for the Social Science) and Amos 10.0. This paper supports consumers' perceived risk theory. For the managerial implications, companies and consumers alike should find ways to reduce uncertainty and risk, which lead to helping customers gain firm confidence when they make decision to purchase products and services.

Keywords: consumption emotions, retailer attributes, perceived risk, patronage intention

THE MEDIATING EFFECT OF TWO ASPECTS OF RISK, UNCERTAINTY AND RISK ABOUT THE OUTCOME AND THE CONSEQUENCE, ON PRODUCT PATRONAGE

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Both uncertainty and risk can be interchangeable for supporting the risk concept of the outcome and consequences. If both concepts, uncertainty and risk, are not equivalent (Cunningham, 1967), uncertainty can be used to reduce the risk of the outcome as the probability is not precisely known while risk can be used to reduce that of the consequences when the probability is exactly known to the end of the consequences. In addition, the handled information reduces the uncertainty of the outcome while reducing the amount at stake or putting off the choice decreases the risk of the consequences. Therefore, uncertainty is well depicted to deal with the outcome because the unknown probability can be reduced by the handled information. Risk is accurately used to reduce stake and delay hazardous consequences. This study focuses on finding out the relationships of two risks with product patronage through empirical research.

Keywords: outcome, consequence, uncertainty, risk, product patronage

PERCEIVED RISK MEDITATED BETWEEN PRODUCT CLASSES, RETAIL ATTRIBUTES, CONSUMPTION EMOTIONS AND PURCHASE INTENT

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The objective of this paper is to find out the relationships of several antecedents such as product classes, retailer attributes, consumption emotions and patronage intent on online shopping stores. Especially, the meditated effects of perceived risk between those antecedents and patronage intent are mainly focused on the empirical study of the Korean market. There are three steps to collect data from the respondents. For example, the first survey was performed to classify SEC (Search, Experience, and Search) product classes in the classroom. To provide the quiet and serenity atmosphere, we use the university classroom to perform the first survey. The second and final surveys were followed by the analysis of the result of the classification of product classes such as SEC. Data from those surveys were analyzed with structural equation modeling technique of Amos 16.0. Findings were verified the relationships of patronage intent with SEC product classes, retailer attributes and consumption emotions meditated by perceived risk. This paper supports consumers' perceived risk theory and for managerial implications, companies should find way to reduce the risk and uncertainty as consumers attempt to purchase products and services. This study proposes and empirically supports the conceptual model that patronage intent results from many factors. Moreover, the results of this study provide managers with a useful framework to develop strategies to reduce the uncertainty, which leads to helping customers gain firm confidence when they make decision to use products and services.

Keywords: product classes, retailer attribute, perceived risk, consumption emotions
patronage intent

FACTOR ANALYSIS OF CUSTOMER VALUE SPIRITS

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The beginning of vodka production in Russia dates back to the late 15th century. Commercial production of vodka's in Russia began in 1861. Aimed at removal of contaminants and, more importantly, fusel oil, it was at this time that mandatory dilution of distilled grain alcohol with water took root. Russian feature is the careful separation of pure ethanol from impurities in the cleaning process distilled spirits (separated head and tail fractions of distillate). It is because of this important technological operation that the traditional Russian alcoholic beverage produced from grain alcohol was called vodka (from Russian "voda", which means water). In light of both historical and cultural traditions and the technical backwardness of the country at that time, it was this particular technological element common only to Russian vodka manufacturers that indirectly established vodka as a uniquely Russian alcoholic beverage. The study involved identification and systematization of factors significantly influencing consumer appraisal of spirits quality. As a result, we were able to develop a multi-attribute model for consumer appraisal of spirits quality with quality function deployment. The study also helped define the primary needs that purchasers of vodka seek to meet through product consumption. The proposed model was assessed in terms of its ability to meet the identified consumer needs. The following conclusions have been made based on the results of the study:

- compared to Russia as a whole, vodka production in the regions of Russia has greater consolidation and higher competitiveness in the product supply structure due to the presence of a large number of non-regional brands,
- spirits consumption in the outlying regions of Russia differs from that of the central regions due to "local patriotism," reflecting consumer preference to locally produced spirits,
- consumer preference to the regional vodka brands is stable in the context of competitive market conditions,
- regional producers possess a logistical advantage that positively affects the size and structure of the spirits assortment and likewise influences consumer choice,
- a significant buyer interest has been observed in regard to the variety and flavor of spirits, as well as the use of physiologically active ingredients, all of which have been taken into account by producers.

Keywords: russian vodka - production, distribution, sale and consumption, pattern of demand

COMPETITIVE ADVANTAGE OF THE GOODS

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The paper presents the reasons for the decline in the efficiency of goods movement modern period. The authors attributed this phenomenon to the change in consumer behavior. Directional influence on purchasing behavior in local sales authors propose to create competitive advantages emotional trading proposal. The authors put forward a working hypothesis about the possibility of increasing the value of trade deals by changing emotional state buyers at point of sale. For this purpose, the projective mouthfeel when selecting products. The results of this study confirmed the hypothesis posed: directionally affecting taste buyers can increase their buying activity. Our studies suggest that the hypothesis of the possible use as a channel marketing communications human taste buds. With their help it is possible to adjust the emotional mood of the consumer, and the consumer a sense of value selling proposition. For us, it seems obvious the fact that the taste and flavor of association handling emotions is little unexplored phenomenon, and still are numerous studies and experiments for the development of a complete, working methods, which would allow companies to more effectively identify and position themselves in the market. However, as is evident by the fact that the sellers of products that succeed in establishing innovative methods of communication with customers at point of sale by the taste of messages will have a strong competitive advantage and thus greatly increase the loyalty of their customers.

Keywords: consumer behavior, emotional mood of the consumer

QUALIMETRIC APPROACH TO OPTIMIZING CONSUMER CHOICE OF SPIRITS

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Consumer assessment of spirits' quality is done directly in the points of sale of alcoholic beverages. This assessment is not accompanied by mathematical calculation or comparison of the results, obtained from various stock-keeping units. Such an assessment is empiric in its nature for the most part. It is not a coincidence that primary attributes that impact consumer choice are external attributes, some of which could be rational (retail price) and may correlate with irrational (non-price quality attributes) in the ratio of 1:9. Such correlation is considered fair from the point of view of the contemporary theory of the "system of balanced indicators", which was developed by the specialists of Stockholm School of Economics Kaplan R.S. and Norton D.P. The importance of external attributes of product value and the necessity of their consideration by manufacturers and retailers was also noted in the research of Kiselev V.M. The fact of consumer selection of specific spirits stock items from diversified family of similar products in essence means a much higher assessment of this product compared to the others. In the light of this, the process of spirits quality assessment in points of sale involves identification of sum-total of exterior attributes, which allow to compare aggregate estimates of various stock keeping units of the same price level in view of their ability to satisfy the most significant requirement in each specific situation. In this context the requirements are defined as diverse life values: security, comfort, and hedonism (satisfaction), dominancy (image support), sociality (demonstration of your identification with a specific social group), cognitivity (knowledge of the world) and, finally, cost effectiveness. Satisfaction of these requirements in its essence is the degree of usefulness of spirits. The appropriateness of this statement has been tested during the focus group, which constituted of respondents representing various price segments, as reported earlier. The article presents the results of research on the disclosure of customer value function of an alcoholic beverage. The chosen object of investigation is Russian vodka. Found that consumers vodka more important attribute is its value: Reputation of the trade mark; Loyalty to spirits quality; Consumer experience based on the previous purchase; Reliability of the manufacturer; Geographic location of the manufacturer. Traditional attributes of quality vodka occupy far priority places in the ranking of consumer advantages of this alcoholic beverage.

Keywords: russian vodka, quality function deployment, customer value attributes

PURCHASE DECISION CRITERIA IN PRODUCT CATEGORY OF PERFUMES: EMPIRICAL STUDY

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Perfumes have been transformed into “feel-good” factor, and help consumers to express their individuality and personal style. The object of our paper is to analyze purchase decision criteria in product category of perfumes with focus on the design of perfume as a purchase decision criterion with female respondents. Nowadays, fragrances and perfumes have become mainstream business in the cosmetics industry. Consumer demand for perfumes is largely dependent on demographics and lifestyle trends, in particular the perception of the importance of luxury and status. Design is the added value of any product, increasing its competitiveness and strengthening market position. Of all product categories, perfumes are one of the most known for its creative design and bottles packaging. We analyze perfume market size characteristics and perfume product characteristics and draw on qualitative interviews (n=100) to explore views on purchasing criteria in perfumes. We found out that most important criterion as declared by our respondents was scent, followed by own experience with perfume, price, brand, design, samples, recommendations, sales staff and advertising in the last position. Consumer purchase criteria are dependent on demographics and lifestyle. Respondents rated the elements of perfume design based on how much importance they attach to them. Next step would be to the research focused on the discrepancy between consumer believes and their behavior. This paper is part of the research project KEGA No. 017EU-4/2013 Youth education in secondary vocational schools focused on innovation and creating new business opportunities granted by Ministry of Education, Science and Sport of Slovak Republic.

Keywords: perfume, purchase criteria, design, packaging

CURRENT ISSUES IN ELECTRIC AND ELECTRONIC EQUIPMENT ENERGY LABELLING

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Authors in the paper analyse current issues in Electric and Electronic Equipment Energy Labelling. The European Commission has launched a review process to evaluate the effectiveness of the Directive 2010/30/EU on energy labelling as well as specific aspects of the Ecodesign Directive 2009/125/EC. The aim of the paper is to analyse and evaluate the revision process of ELD. The principal objectives of the Energy Labelling and Ecodesign Directives (ELD and ED) include saving energy and contributing to meeting the EU target of a 20 % reduction in energy consumption by 2020. The Energy Labelling Directive foresees that the preparation of energy labels for product groups, will give clear information to consumers, enabling them to take into account the energy performance of products in their purchase decision. The 2010 recast of the energy label has led to several significant changes from the original energy label format. To ensure the future relevance and effectiveness of the energy label as an informative market transformation tool the greatest necessity is to revise the energy label scale so that higher efficiency levels can be communicated in the future. This paper is part of the research project KEGA No. 017EU-4/2013 Youth education in secondary vocational schools focused on innovation and creating new business opportunities granted by Ministry of Education, Science and Sport of Slovak Republic.

Keywords: electric and electronic equipment, energy labelling, ecodesign, energy label format

ASSESSMENT OF OXIDATIVE STABILITY OF RAPESEED AND SUNFLOWER OILS

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The analysis was aimed at assessment of the oxidative stability of selected vegetable oils. The objects of the tests were cold pressed and refined rapeseed oils and sunflower oils. The paper presents general overview of the tested oils, including their characteristic values and their acid compositions. Oxidative stability of oils was determined with the use of iodometric titration - by calculating the peroxide value, during storage of samples for 33 days in the temperature of 24°C, with the access of dispersed light - and of spectrophotometer. The functions are provided, describing - with considerable precision - changes in the peroxide value of the stored oils. This is confirmed by calculated error values describing deviation of the empirical values from theoretical values $e_m =$ od 1.40% to 4.23%. The oxidation process was the fastest in the refined rapeseed oil, which is conformed in the value of rate constant $w_1 = 21.054 \cdot 10^{-3}$. In the case of pressed sunflower oils, the Totox value of 10 was exceeded, which is a sign of poor oxidative resistance. The content of MUFA in rapeseed oils is 2-3 times higher than in sunflower oils. The UFA/SFA rations range between 11.25 and 14.06 for rapeseed oils and between 6.54 and 8.28 for sunflower oils. The content of PUFA in sunflowers oils is approximately two times bigger than in rapeseed oils. Sunflower oil is rich in linoleic acid, while rapeseed oil contains both linoleic and α -linoleic acids in proportions very beneficial for humans, approximately 2:1. Spectrophotometric analyses were performed with the use of UV-VIS spectrophotometer by UNICAM. Anti-oxidative power was determined by means of FRAP and DPPH methods. Total contents of polyphenols was established. It was determined that the oils are not rich in polyphenols, nor are they highly anti-oxidant.

Keywords: vegetable oils, oxidative stability, FRAP

THE ROLE OF THE CONSUMER IN THE COMMODITY SCIENCE -THE CASE OF ENVIRONMENTALLY AND SOCIALLY SUSTAINABLE TEXTILE AND CLOTHING PRODUCTS

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In modern commodity science, more and more attention is given to product quality analysis carried out from the consumers' perspective as well as to the analysis of consumer-manufacturer relations. In this context, increasing importance is given to the analysis of factors influencing consumers' behavior, in particular those affecting product perception and differentiation. As the consumer behavior varies significantly within different product groups, analyses focusing on a specific market or a market segment are becoming very useful. Such analyses are also more likely to be of practical use for day-to-day business activities. The aim of the article is to analyse Polish consumers' behaviours, their determinants in the market for particular product group, i.e. textile and clothing products with ecological and social attributes. Textiles and clothing, very much like food products, are among the basic groups of consumer goods. Textiles accompany humans "from cradle to grave", and contribute to the feeling of comfort and health. Textile and clothing industry is also a grossly underutilised sector of the Polish economy, sometimes seemingly bordering on irrelevancy, while in fact – according to the European Commission's reports Poland owes its considerable share in European industry to the production of innovative textiles, including those meeting stricter environmental and social standards. The paper answers several very important questions: What factors influence consumer behavior on the market of "sustainable" textile and clothing products? Is this group of products relevant to, appreciated and bought by Polish consumers? What is consumers' role in the further development of this market? Last but not least, how can consumers contribute to the solutions to the environmental and social problems of the textile and clothing industry?

Keywords: consumers behaviour, environmentally, socially, sustainable, textiles, clothing

FOOD DESIGN AS INNOVATION IN THE FOOD PRODUCTS DEVELOPMENT - MODEL ANALYSIS

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Concept Food Design is an innovative approach to the development processes of food products and nutrition services, based on creative solutions in the design process of functional characteristics and design throughout the life cycle. The essence of this idea is the process of creating a comprehensive image of the new products and the impact on consumer perception, by satisfying their higher needs-recognition and self-realization. The concept of creating innovation in the food market is in the first phase of implementation. In this situation requires defining and organizing logic of these phenomena. This paper attempts to evaluate a new approach in the realities of Food Design Polish food market for background experience of the world proposed models of static and dynamic process of food products based on this method and indicates potential directions of research and applications.

Keyword: food, innovation

QUALITY EVALUATION OF CURD CHEESES AVAILABLE ON LUBLIN MARKET

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For several years, a dynamic growth in the consumption of cheeses in Poland is reported. Acid curds, known as “white cheeses”, are very popular among consumers due to their relatively low price and eating habits. The aim of the study was to evaluate the physico-chemical quality of acid curd cheeses available on retail network in Lublin region. Research material was the curd cheeses (skinny, semi-skimmed and fat) offered by five dairy cooperatives (A, B, C, D and E). All samples were taken during the product shelf life. A total of 68 samples were analysed. Contents of fat (according to Van Gulik method), protein (Kjeldahl method) and dry matter (method of drying at 102°C), acidity (titration method) and color (by Minolta chroma meter CR-310 in the CIE L*a*b* color space) were determined. It has been shown that with the increase of declared amount of fat the proportion of water decreased in the assessed cheeses. It should be noted that all cheeses, with the exception of one skinny cheese from dairy B, meet the requirements regarding the content of these two components, i.e. water and fat. It was also found that in most of cheeses (fat and semi-skimmed cheeses, and the skinny cheese from dairy B) the fat content per 100 g of cheese was overstated compared to that declared by manufacturer on the label. The biggest derogations “in plus” were recorded in the products offered by dairy A (2.15 p.p.) and C (2.61 p.p.). Protein content was also proved to be incompatible with the declaration, however, the cheeses from dairy C included the biggest amount of this ingredient (overestimated even by 4.26 p.p.). No effect of group of cheeses and dairy on curd acidity was obtained. In all cases, this parameter was in the ranges of PN-91/A-86300 standard. Among all types of curd cheeses, the highest rate of lightness (L*) and the highest share of red-green color (a*) were characteristic for products from dairy C. Nevertheless, the skinny and semi-skimmed curd cheeses from dairy E had the highest rate of yellow-blue color (b*).

Keywords: curd cheeses, quality, standards

FLAVOUR PROFILES AS INDICATORS OF BOTANICAL ORIGIN OF HONEY

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As for honey, authenticity verification is linked with their varietal identification; therefore, this research study is an attempt to determine the varietal authenticity and origin of honey that would allow identifying the botanical origin of honey with the use of HS-SPME/GC-MS method. The aim of the study was to determine what compounds are present in the volatile fraction of varietal honeys, and then isolating the flavour profiles of experimental material and find the differences in the composition of volatile aroma compounds in honeys of different botanical origin. The experimental material in the present research study consisted of 72 samples of honey belonging to the variety types (nectar [from rape, acacia, heather, linden, buckwheat, and multi-floral nectar from various plants] honeydew, and floral-honeydew). The honey samples analyzed were produced in apiaries located throughout Poland, and each sample was from a different apiary. The botanical origin and the purity of honey samples were monitored using a savouriness profiling method developed by Cairnocros and Sjöström and modified by Tilgner. In the studied samples revealed the presence of more than 300 different compounds, of which failed to identify nearly 200. For each variety honeys selected characteristic fragment ions for which the areas of the peaks in the variation were higher than in all other samples belonging to other varieties. Comparison of varietal honeys samples using the method HS-SPME/GC-MS allowed to designate compounds that can serve as discriminants for classification of honey because of their variety.

Keywords: honey, botanical origin, HS-SPME/GG-MS method

COMPARISON OF CONSUMER SHOPPING BEHAVIOUR OF ORGANIC FOOD IN SLOVAKIA AND ABROAD

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The purpose of this paper concentrates on the survey of the Slovak market for organic food and on the comparison of shopping behaviour of Slovak people living in Slovakia and the same number of Slovak people living in Luxembourg. The results of the survey have pointed out problems of the Slovak market for organic food and the still insufficient marketing of organic food and organic agriculture in Slovakia. In any case the situation in this area has considerably improved in the recent years and there is a big potential for development of this market segment. The area of ecologically cultivated soil is increasing, in turn also increasing the amount of organic food globally. In terms of the development of the organic food market in Slovakia, the greatest problem is the lack of interest from the side of food production companies when it comes to processing of the relatively small amount of organic products produced by ecological agriculture, as well as insufficient demand from the customers. Demand for organic products is determined by several factors. Understanding of them, as well as understanding their effects on shopping habits of customer is one of the conditions for increase in demand for organic food. In future, it is expected for the organic food market to grow. Significant role in this growth will belong to extensive public retail chains. Constant growth of demands for organic products and organic food from customers will be driven by their reduced confidence in regards to conventional methods, especially if conventional agriculture fail to satisfy their demands in terms of better communication about questions concerning for example genetically modified organisms, livestock production, animal nutrition etc. The subject of organic food and ecological agriculture is, in accordance with the mentioned reasons, current not only in Europe and Slovakia, but in the whole world.

Keywords: organic food, organic agriculture, shopping behaviour

REGULATIONS RELATING TO THE CONTAINED USE OF GMOS ON THE EXAMPLE OF A PHARMACOLOGICAL RESEARCH INSTITUTION - CASE STUDY

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In the recent years, scientists and companies from all over the world have developed Genetically Modified Organisms (GMOs) by adopting modern biotechnology. GMOs are defined by the WHO as organisms in which the genetic material has been altered in a way that does not occur naturally. Both plant and animal organisms could be genetically modified. Most genetically modified plants have a great economic importance and changes of their genome allow to obtain new features desirable by humans i.e. pathogen and herbicide resistance or increased quality and nutritional characteristics. Animal modifications are most often conducted to obtain organisms with desirable breeding features i.e. faster weight gain, increased productivity or disease resistance. Moreover, genetically modified animals are used in the production of proteins, enzymes and other substances used in the pharmaceutical industry. The use of these organisms is associated with the contained use of GMOs, which requires adopting proper precautions connected with isolating GMOs from the environment. The use of GMOs causes a lot of controversy in the society. Therefore, the European Union has devoted much attention to the safety management of research on GMOs and their impact on the environment. A number of documents regulate handling of genetically modified organisms. These regulations determine e.g. the manner of dealing with genetically modified biological materials, risk assessment, space and staff safety requirements as well as adequate documentation. There is a need to adapt the aforementioned regulations to the profile of an institution involved in the work with GMOs. This publication provides guidance for the contained use of GMOs in a pharmacological research institution, which have been prepared on the basis of existing legislation in Poland.

Keywords: GMO, safety management, contained use of GMOs

THE RELATIONSHIP BETWEEN PERSONALIZED CUES, GOODS CHARACTERISTICS AND PURCHASE-DECISION

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Although many firms recommend their goods to users, the results often fail to meet their expectation. The present paper views recommendations as persuasive attempts and investigates the effects of recommendations on users' responses to the offers. In Study 1, we explore the role of personalized cues in recommendations for Internet Protocol Television services, laptop computers, and alkaline batteries. In Study 2, more specifically we focus on the choice of services goods. Our findings reveal that under uncertainty personalized cues may be a justification for choice and reduce the perception of threat to freedom. However, the effects of personalized cues vary according to the attributes of recommended goods. Implications for researchers and practitioners are discussed.

Keywords: recommendation, personalized cues, psychological reactance

BRAND MARKETING STRATEGIES OF INTERNATIONAL SMARTPHONE MARKET

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The purpose of the current study is to analyze the brand marketing strategies of smartphone in the global market. This research intends to identify the effective global marketing strategy for global smartphone manufacturers to investigate how smartphone's brands develop their marketing strategy to comply with different conditions. For the purpose of the study, operation of the big brands of smartphone in the global market which is SAMSUNG, LG, APPLE, HTC were researched and the related regulations were reviewed. The strategies to respond to the growth of smartphone brands are summarized as follows: ① Smartphone brands in the global market should realize and understand the changes in market environment, ② Innovation and creation are needed in entire business system, and ③ Smartphone industries need to set the vision to extend to other industries. Accordingly, Striking the right balance between standardization and localization greatly contribute to smartphone brand's success. Moreover, the key success factors of handset manufacturers include the competitive quality and innovative technologies, information collecting, brand building, and collaboration with key partners. The results of this study will be useful to marketers currently operating in the smartphone industry to develop their international marketing strategy and new products. Also, they will be contributed to the academic world by illustrating theoretical issues of global marketing strategy in the real-world case study.

Keywords: brand marketing strategies, smartphone brands, smartphone market

ECONOMICS ANALYSIS OF MARINE FISHERIES AND ACQUACULTURE IN CROATIA AND TRADE BALANCE WITH ITALY

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The aim of this paper is to identify the key activities and players within Croatian marine resource sector which determine the trade balance with Italy. Firstly, size and the structure of the marine fisheries in Croatia are investigated taking into account time trends and the effects of the EU common market policy. The map of the markets for fishery products is presented. Since the wholesale market places are established with difficulties in Croatia, the trade channels of the marine fishery products are rather heterogeneous. Next, the market size and structure are analyzed for the specific markets, together with the analysis of the information asymmetry problems. There are some indications that the prices of the fishery products are rather low in Croatia. Thus, we evaluated the processes of the price formation in order to provide the answer to such a question. The application of certification schemes which reduce information asymmetry problem is investigated with special emphasis on the reasons for relatively poor application of such schemes. Furthermore, we compared the size of export and import of the fishery products. In particular, we look at the relevant indicator of trade with Italy. Since both, fishery products and international trade, are usually characterized by various types of information asymmetries, we investigate the importance of such problems for the trade of fishery products between Croatia and Italy. Finally, we assess if certification schemes may reduce information asymmetries in trade of fishery products between Italy and Croatia. By resolving problems of adverse selection and moral hazard, certification schemes may restore the market and foster the trade. Furthermore, certification may affect the structure of the goods exchanged, so that quality, environmental and social impact of fishing techniques and processes are taken into account.

Keywords: marine fisheries, Croatia, certification, trade balance

EFFECT OF FORTIFICATION WITH Fe³⁺ AND Zn²⁺ IONS ON PROPERTIES OF TYPE 4 RESISTANT STARCH

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Modified starches are recognized as a good carrier for fortification with microelements such as iron, zinc or copper. Efficiency of ions adsorption on starch mainly depends on: type of ion, botanical origin of starch and type of optional modification. Enrichment of starch with microelements may lead to changes in its pasting, rheological and texture properties as well as color. Therefore a proper choice of starch as carrier for microelements should not be based only on studies regarding adsorption efficiency, but also on the set of physicochemical properties of starch product. The aim of the work to evaluate effect of fortification with iron and zinc ions on the quality of type 4 resistant starch. Native potato and waxy corn starches were investigated material. They were modified with cross-linking agent containing adipic and acetic anhydride, according to the method developed by Department of Institute of Agricultural and Food Biotechnology in Poznań. Starches were fortified by adsorption from iron or zinc sulfate solutions of concentration of 1 mg of ion per 1 g of starch. Fortified starches were examined in terms of: iron and zinc content with Flame Atomic Absorption Spectroscopy, pasting properties with Brabender viscograph, rheological properties with Haake RotoVisco1 rhometer, texture profile with SMS TA.XT2 texturometer and absolute color parameters with Minolta CR-300 colorimeter. It was found that potato starch revealed higher adsorption efficiency of both iron and zinc ions. Rheological properties, texture and color parameters were similar for both analyzed fortified RS4 starches. Moreover adsorption of zinc ions on RS4 potato starch resulted in particularly beneficial changes of rheological properties and color. Therefore potato starch should be recommended for manufacturing fortified type 4 resistant starch, rather than waxy corn starch.

Keywords: resistant starch, RS4, fortification, rheological properties, TPA

THE WORLD MARKET OF FUNCTIONAL FOODS

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In the last years the “modern” foods, such as functional foods, have gained a prominent place in the daily eating habits of the world population. These foods, in addition to the basic nutritional properties, play more beneficial functions on the organism, improving the state of health and reducing the risk of disease. Healthier food products have entered in the global markets with force in the past few years and have rapidly gained market shares. The food industry has reacted to this trend by developing a growing variety of new products with health-related claims. Most of the industries are investing in this sector in line with the trends of the society that is increasingly looking for healthy foods with added benefits for improving health, well-being and quality of life. The industries are adapting their strategies and their communication to raise awareness of health and consumer demands. This varies considerably from country to country and influence the choices mainly the culture and traditions. The development and the commerce of these products is rather complex, expensive and special requirements should be answered. Besides potential technological difficulties need to be taken into consideration legislative aspects and consumer demands when developing functional foods. In particular, consumer acceptance has been recognized as a key factor to successfully negotiate market opportunities. In recent decades there has outlined the framework of a rapidly expanding market, initially in Japan, where these foods are officially born, then in the United States, in Europe and internationally. This paper provides an overview of the current situation of the global market of functional foods.

Keywords: functional foods, health benefits, consumers, market, consumption trends

MEASURING BUSINESS EXCELLENCE - QUALITY ORIENTATION MATURITY

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The aim of the paper is to identify the Quality Orientation (QO) maturity level in organizations coming from Poland and abroad. The key research questions are: What is the Quality Orientation maturity level in organizations coming from Poland? Does the level of Quality Orientation maturity in organizations in Poland differ from the level of Quality Orientation maturity in organizations from abroad? The level of implementation of Quality Orientation is defined as the level of the implementation of the eight Quality Management Principles (QMPs) in organizations. To measure and analyze the survey results concerning the Quality Orientation (QO) maturity level in organizations it was used a specially designed questionnaire with 42 statements. This paper reports on the results obtained from the survey conducted in Poland, Serbia and Ukraine. There is respondents' perception concerning Quality Orientation maturity level. The study of Quality Orientation (the eight quality management principles) maturity level has confirmed that the level of Quality Orientation maturity is on the average level in organizations coming from Poland. The conducted survey confirmed also that the level of Quality Orientation maturity in organizations in Poland is slightly higher than in organizations in Ukraine and definitely higher than in organizations in Serbia. But at the same time all organizations achieved the average level of Quality Orientation maturity regardless of the country they represented. The main research limitations of this paper include that the results concerning surveyed sample. The paper adds value by the identification the level of Quality Orientation (QO) maturity in surveyed organizations in Poland and abroad.

Keywords: Quality Orientation (QO), Quality Management Principles (QMPs), maturity, measurement

FOOD PACKAGING AS NON-SATISFACTORY COMMUNICATION INSTRUMENT IN OPINION OF CONSUMERS

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Business entities connected to packaging branch and dynamically developing market, especially the food one and the science representatives connected to packaging are aware that packages must be constantly improved. It is crucial that innovative activities must be compatible to social responsibility. Packaging improvement must include demographical and social factors, as well as consumption customs and habits strictly connected to the growing needs and expectations of customers. The research is conducted which concerns the analyses of the needs and assessment of acceptance of packaging used to pack the products. The research done among different groups of consumers, including seniors, regardless of the world region, indicate a low level of their satisfaction with the packaging, especially as far as the usefulness and communication transfer by their labelling are concerned. The aim of the present research was to define the parameters connected to communication transfer by labelling the often bought packaged food products, which cause that the packaging is assessed as friendly or relatively unfriendly for older consumers. The scope of the conducted research concerned the elderly people`s opinion about: the purchase determinant of the chosen food groups, including the factor which is packaging, next validity of certain packaging features, including proper labelling and the assessment of labelling elements which are communication transfer. The achieved research results allowed to indicate the reasons of not fulfilling the communication function by the packaging in a satisfying way for senior consumers and the assessment of the packaging used as unfriendly for them. What is more, the results allowed to define the needs and the scope of further research in order to improve the packaging, including their informativeness.

Keywords: food packaging, packaging as communication instrument, senior consumer

SUSTAINABILITY CRITERIA AND CERTIFICATION SCHEMES OF BIOFUELS IN THE EUROPEAN UNION

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The growing demand for energy from fossil fuels has generated an increase in their price and in the emission into the atmosphere of greenhouse gases (GHG) and pollutants. To reduce these effects, many countries in the world have undertaken policies to promote the production and use of biofuels which are more sustainable than traditional energy sources. They, in fact, are considered an efficient/effective option to decrease the above-mentioned emissions and energy dependency, as well as an opportunity for rural development, especially in developing countries. However, scientific studies have shown that the 1st generation biofuels, obtained by energy crops, causes evident environmental and social impacts. Therefore, it might be useful to introduce certification systems of biofuel sustainability level according to specific criteria. Currently there are no standardized procedures and parameters: each country, indeed, has acknowledged own certification schemes. This has created problems of consistency, transparency or comparison and generated confusion and perplexity on the part of economic operators. The European Union, with the Directive 2009/28/EC, has established a number of specific criteria and recognized 14 different certification systems so far. These are referred to national and international level and to voluntary and mandatory approaches. The growing number of “validated” systems, within the EU, has certainly stimulated the competitiveness among them, expanded the regulatory framework and developed tools of checking and monitoring; but the aforementioned problems had not been solved yet. In this context, the present work aims to carry out a careful analysis of these aspects, highlighting critical issues and potentiality.

Keywords: biofuels, sustainability criteria, certification schemes, Directive 2009/28/EC, environmental impact

COMPARATIVE ANALYSIS OF ISO DOCUMENTS – EN 9001:2008 AND GS-R-3

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The term of a standard is nowadays used in numerous fields of human life, whereas a standardising activity exerts a significant impact on economic development, trade, services as well as on the areas of human existence. Designing, creating and functioning of the units generating nuclear energy is strictly connected with a number of threats both for a human and the entire environment. Thus, creating, issuing and subsequently deploying branch standards in this particular scope seems to be justified. Standardised management systems constitute one of the devices that can be used in the process of organization management. However, the necessity of the use of branch requirements specific for nuclear energy, which are an ideal complement of the standards of the International Organization for Standardization (ISO), must be emphasised. This article deals with the comparative analysis of two standardising documents which regulate system aspects of enterprise management. The first one is standard ISO-EN 9001:2008 Quality Management Systems. The second one is an International Atomic Energy Agency (IAEA) standard GS-R-3 - The Management System for Facilities and Activities Safety Requirements. Comparative analysis showed that both IAEA GS-R-3 and ISO 9001:2008 are based on the following common management principles, which reflect good management practices. Major differences in both documents occur in focus: in IAEA GS-R-3 focus is safety (promotion of safety culture an integral part), while in ISO focus is customer satisfaction. Also, major difference occurs in degree of integration: GS-R-3 requires integration of requirements (health, environment, security, quality, economic and risk) while ISO 9001:2000 has no requirement to integrate safety, health, environmental, security, quality and economic elements. There are also differences in terminology used and in specification of processes.

Keywords: comparative analysis, EN 9001:2008, GS-R-3, quality management system, safety requirements

CONTRIBUTION OF GEOGRAPHIC INFORMATION SYSTEMS (GISs) TO DETERMINE PROFILES OF PACKAGING WASTE MIX GENERATION. A LITERATURE REVIEW AND ITS VALIDATION

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A reliable and accurate estimate of the amount and mix of expected municipal solid waste is needed in order to plan a management system and the necessary infrastructures for their treatment and recycling, according to the context where they have been generated. Figures released for Italy show that the mix of the generated urban waste is different from area to area, depending on the urban context and on the type of activity that characterize the area. The existing literature provides a number of variables to be used in order to identify the context of reference and determine urban waste production profiles in terms of quantity and mix. However, the division between domestic waste and assimilated waste remains not measurable, thus impeding the possibility to predict the expected municipal waste mix, especially considering the fact that the latter can largely affect on it. After presenting the review of the most recent literature on the topic, the present work will suggest a new methodology to investigate the existence of a relationship between the type of economic activities in one area and the mix of municipal solid waste generated in the same area. The aim is to investigate the possibility to create expected municipal solid waste *profiles* and subsequently plan a proper management system such as the proper location and distribution for treatment and recycling facilities. The methodology that will be proposed is based on a Geographic Information System (GIS), an instrument more and more used in several waste management applications, able to analyze spatially-referred data and to provide results geographically visualized. The article will also provide a brief focus on the state of the art of the implementation of the Regulation 2150/2002 of the European Parliament on waste statistics at the European level, being available and consistent database the mean elements that allow performing waste management analysis based on empiric data.

Keywords: Municipal Solid Waste, Geographic Information Systems, Waste Management, Assimilated Municipal Solid Waste

EXAMINATION OF THE SATISFACTION OF RUNNING EVENTS' PARTICIPANTS

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We may observe a significant rise in popularity of running events in the last several years, which has entailed the necessity to organize them at the highest level possible, because of their competitiveness. Simultaneously there are a few runs held (marathons, half marathons and others); hence, the participant increasingly often must choose on the basis of broadly understood quality of these undertakings which is directly related to other participants' satisfaction. Quality is connected to compliance with the given criteria. Before establishing the scope of runners' satisfaction, though, it is necessary to define model quality criteria for an event. These criteria will be diverse and dependent of the specified event as well as runners' profile. The verification of participants' satisfaction requires establishing the complete scenario of the research – defining objectives, theses and hypotheses. In order to verify the satisfaction it is crucial to select the research method, or more adequately: research methods. A survey with the use of a questionnaire, which is frequently used, tends to oversimplify the research. Hence, the organizer should in a systematic way make effort to define requirements towards the run as well as they ought to measure the participants' satisfaction in order to be able to make decisions related to the next editions of a given event. Client satisfaction measurement is connected with defining who the client is, i.e. mostly a runner, but it should not be forgotten that other participants (supporters, relatives, sponsors) also shape the event. The second group of clients amounts to so-called internal clients, i.e. organizers and volunteers. The key question of managing a running event participant's satisfaction is defining the most important elements of a given run. At various stages of the research it may be possible to design it so as to ensure the compliance of runners' opinions with the model quality of a running event.

Keywords: managing customer satisfaction, quality management in running events, quality in sport

THE INFLUENCE OF COLORS UPON THE QUALITY OF E-LEARNING SPECIFIC COGNITIVE PROCESSES

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Starting from today's economic and social realities, the current paper approaches the theories developed in the area of e-learning –with the purpose of explaining the subjective dimensions of quality in this area. There are many factors that influence the overall perceived quality of an e-learning course, such as social, economic, legal, cultural and psychological ones. As e-learning, ultimately, has to contribute to the improvement of human resource, Thus, the research presented in this paper focuses on the influence of color – one of aesthetics and design instruments, upon the cognitive processes generally people deploy when facing a logical problem. The objectives of the research relate to discovering students' preferences for certain colors while processing problems requiring cognitive processes specific mainly to left cerebral hemisphere - such as mathematic calculus, logical and sequential tests, codes and unfamiliar words processing. Also, another aim of the study is to see how the attributes of colors like saturation and temperature affect these thinking processes when they are combined and to identify whether the students spontaneous preferences for some colors guide them towards choosing the same ones for solving the logical problems. The research was deployed on students belonging to Bucharest Academy of Economic Studies, on a representative sample.

Keywords: e-learning, color, quality, cognitive processes

THE PERCEPTION OF ACTA IN EU. A ROMANIAN HIGHER EDUCATION INSTITUTION CASE STUDY

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Due to the fact that the general public took attitude against Anti-Counterfeiting Trade Agreement (ACTA), the treaty was finally rejected by EU parliament. The present paper aims to look for the mechanisms that formed the perception of young people regarding this treaty. To this purpose, a research has been conducted on a sample of master students from Romania, an EU country. The research showed that only a very small part of respondents had a whole image and complete understanding about ACTA. Generally people, despite the fact that they were educated as they were following a master's degree program, did not search for objective information. The analysis showed that their perceptions were rather formed and strongly influenced by mass-media and social networks. Also, it showed that the majority of respondents knew only partially the provisions and the purpose of ACTA and, generally, this agreement was regarded as a system of regulations for controlling and distributing the information in its various forms through information technology, especially on Internet through websites and social networks. The research showed that there was a greater number of respondents who expressed an attitude against the measures proposed within ACTA, than the number of those who were favourable to this treaty's adoption. Privacy, freedom of expression and of getting informed generated the attitude against ACTA provisions. Also, the research has proved an association between the extent of understanding ACTA's provisions and respondents attitude towards this agreement.

Keywords: ACTA; counterfeiting; social networks; mass-media; behaviour analysis

MANAGING INTELLECTUAL CAPITAL IN THE COMPANIES FROM SMES SECTOR

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This paper primarily aims to establish determinants and methods concerning intellectual capital management in the SME sector in order to create an alternative management model. It is generally known that two types of capital are present in every company: financial and intellectual. Both are very important, but while the first type is readily understandable for entrepreneurs and the rules for managing it are basically clear, intellectual capital is still unfamiliar to entrepreneurs and presents a serious challenge to them. Many Polish companies, especially in the SMEs sector, do not realise that the capital is one of their assets and fail to make it part of their business strategies. Managing the intellectual capital is an effect of creating the added value on the basis of the immaterial assets of the company, and it is exactly this ability to manage the immaterial assets, which is becoming in the times of an increasing globalization and competition a necessary condition for each company, which wants not only to survive on the market, but also to develop and achieve competitive advantage. The key competence of companies in this field is an effective managing the intellectual capital, which is constituted by the human capital and structural capital. Unfortunately, mostly the literature of the subject, as well as the economic reports show the experiences of large companies (corporations) in the range of using the intellectual capital, while for the sector of small and medium size companies this problem is almost totally unknown and unavailable. And it is the sector of SMEs that is contributing to the economic growth, is a basic source of GDP creation and creation and sustaining of the workplaces. That is why, main aim of this paper will be an attempt of defining the intellectual capital for the needs of the small and medium size companies and separating the differences between the SMEs sector and the corporations in the range of utilizing the strategy of managing the intellectual capital. It will enable to separate the most important components of the intellectual capital for the SMEs, which will be essential for creating a model.

Keywords: intellectual capital, SMEs sector, innovations

LASER PULSE METHOD FOR INVESTIGATING THE THERMAL DIFFUSIVITIES OF INSULATING MATERIALS

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In this paper, the pulse laser method to measure thermal diffusivity insulating materials was introduced. A schematic diagram of an instrument based on the Parker procedure for evaluating the thermal diffusivity of leather and other insulating materials such as leatherlike and rubber used in footwear, is presented. A method for measuring the thermal diffusivity on that apparatus has been established. A nonlinear equation based on the differential heat balance is proposed for computing the thermal diffusivity. The balance does not include the sample heat losses. A method for measuring uncertainty computation is also presented. The instrument prototype was used in preliminary tests. The statistical analysis of the results has indicated a good accuracy of the method. Uncertainty of the thermal diffusivity measurement using the laser pulse method of natural materials does not exceed 4% and leatherlike materials 3%. According to the calculation for leather, which has a thickness of about 1 mm, the measurement of thickness introduces 1 % error thus resulting in a 2 % error in thermal diffusivity. To avoid the error introduced by the thickness measurement error, other accurate thickness measurement methods such as optical methods may be used. To fully assess the inconclusiveness of the measurement of insulating materials thermal diffusivity, it is necessary to check heat loss impact on the measurement results. Using a more powerful laser with short, right-angle pulse laser will decrease the inconclusiveness of low-thickness material measurements (less than 1 mm). A high coefficient of variation of the thickness of materials causes the inconclusiveness of their thermal diffusivity measurements. Of the tested materials, leather used for shoe uppers is characterized by the lowest thermal diffusivity ($0.86 \div 1.05 \times 10^{-7} \text{ m}^2/\text{s}$), whereas rubber displayed the highest thermal diffusivity ($2.15 \times 10^{-7} \text{ m}^2/\text{s}$).

Keywords: the pulse laser method; thermal diffusivity; insulating materials

INVESTIGATION OF SWEET SUBSTANCES OF DIFFERENT MOLECULAR STRUCTURE BY POTENTIOMETRIC TASTE SENSOR WITH ALL SOLID STATE ELECTRODES

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A five channel potentiometric taste sensor consisting of an array of All Solid State Electrodes (ASSESS) with different lipid-polymer membranes has been developed. The electrodes are constructed of glassy carbon discs with electrochemically deposited *poly(3,4-ethylenedioxythiophene)* (PEDOT) acting as ion to electron transducer. The outer layer of the electrode is lipid-polymer membrane. Lipid substances immobilized in PVC membranes can be divided into cationic: 1 -benzyltrimethyltetradecylammonium chloride, 2 - dodecyltrimethylammonium bromide and anionic: 3 -palmitic acid, 4 - stearic acid, and 5 - phytol. It is already known that the sensor's output exhibits similar patterns for acidic substances of ionic structure like hydrochloric, citric, acetic tartaric acids. It is well known that the type of sweetness varies with the substance in terms of its taste and aftertaste. The sweet taste and aftertaste of intense sweeteners is very specific and usually easily recognized comparing to that of carbohydrates. In this work the sensor's responses to different sweet substances have been examined. The output patterns for monosaccharides (glucose and fructose), disaccharides (sucrose and lactose) as well as intense sweeteners of various molecular structures (acesulfame K, aspartame) have been studied. The relationship between the sensor's response patterns and sweetness values of studied sweet substances has been investigated. The influence of the chemical structure of sweet substances on electrodes' responses has also been discussed. The results of Principal Component Analysis (PCA) of the sensor's responses have been presented in the context of its capability of discriminating the sweet flavour of the studied carbohydrates and intense sweeteners. In the long run this sensor is intended to be applied for discrimination of a vast number of commercially available soft drinks.

Keywords: taste sensor, sweet taste, intense sweeteners

ENERGY CERTIFICATION OF BUILDINGS IN ITALY

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In the European Union buildings account for 40% of total energy consumption and are responsible for 36% of CO₂ emissions. Therefore, improving the energy performance of buildings is strategic to achieve the EU energy and climate goals, known as 20-20-20 targets to be met by 2020, which is a reduction of greenhouse gas emissions of at least 20% below 1990 levels, a 20% reduction in energy consumption and increase at 20% of the use of energy from renewable resources. Furthermore the reduction of energy consumption and the use of energy from renewable sources in the buildings sector constitute important measures needed to reduce the Union's energy dependency from foreign countries. The main legislative instrument to implement the EU policy on energy performance of buildings dates back to 2002 when the Directive 2002/91/EU on the energy performance of buildings was adopted. This Directive has been recast in 2010 (Directive 2010/31/EU) to introduce substantive amendments to establish more ambitious goals such as national plans to increase the number of nearly zero-energy buildings, requirements for minimum energy performance and energy performance certificates. At present, in Italy, along with the Ministerial guidelines on energy buildings certifications, published in 2009, different regional methods have been developed. The lack of a share method causes a certain degree of confusion and the application of energy certification is not homogeneous. This paper provides a description of the energy certification schemes of buildings adopted in Italy both at local and national level pointing out the main differences such as performance indicators, calculation methods and registration procedures that lead to important differences in the energy buildings assessment among regions. A critical comparison of the schemes will allow to identify the most useful one in order to comply with European energy policy.

Keywords: EU legislation, energy, buildings certification

HELICULTURE AND SNAIL CAVIAR: NEW TRENDS IN THE FOOD SECTOR

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Snail caviar is a “haute cuisine” new food product and an expensive and luxury delicacy. For some markets it is a novelty and a profitable creative idea. “Pearls of Aphrodite” for the ancient Greeks, “œufs d’escargot” for the French who have been using them for over thirty years, “caviar de caracol” for Chileans who are big producers, these eggs taste of herbs and minerals. The smell is like that of earth, mushrooms, cabbage and clover encased in small white spheres. The production of caviar is re-launching also the use of snail meat, and heliciculture the process of farming land snails specifically for human consumption, is currently expanding in Europe, where snails are considered a very popular delicacy in several European countries. Land snails are recognized as healthy food due to their low fat content and presence of those nutrients required for a well-balanced diet. However, no studies have been published on the nutritional and antioxidant properties of land snail eggs. The purpose of this paper is to analyze the phenomenon in relation to the lack of specific legislation that regulates the production and trade, as well as of an European quality certification that identifies the product. In addition, snails are also considered as one of the worst causes of food allergy. In fact, some people may develop severe episodes of asthma after ingestion of snails and a connection with house-dust-mite allergy is firmly established; more recent dated studies have identified an allergen in snails which is responsible for cross-reactions with foods and inhalants. Snail allergy is rare but it can cause fatal and near-fatal anaphylactic reactions, so a notice explaining the hazards of eating snails should be included in the label together with other relevant information for consumers.

Keywords: snail caviar, heliciculture, white caviar, snail meat, allergy

INSECTS FOR FOOD: A CRITICAL REVIEW

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Environmental degradation, depletion and waste of natural resources, including food, and the rate of growth of the world population are in constant increment and impose, in accordance with the principle of sustainability, the adoption of different consumption habits, especially alimentary, in order to give all people and future generations the same standards of living compared to the current wealthier populations. In these terms, the use of insects for human nutrition, in the near future also for Western societies, seems, more and more, a real opportunity to pursue. These particular alimentary sources are, in fact, very rich in nutrients (noble proteins, essential fatty acids, vitamins, etc.). Moreover, they represent, without any doubt, also an environmentally sustainable alimentary choice due to the fact that many species of edible insects show an excellent efficiency of food conversion index (ECI) and a low environmental footprint. However, there are still many problems, first of all those concerning the psychological acceptability of this kind of food by many cultures; the evaluation of this issue anyway will be deliberately neglected in this paper. The authors will also omit, though they are important from a commercial perspective, those aspects related to the use of insects as feed for farm animals and as source of pharmaceutical agents. In the current note, authors will critically investigate the nutritional, ecological and economic issues connected with the consumption of these important and highly sustainable food resources, their factory farming and commercial maturity, highlighting that there is still, in this regard, the necessity to conduct further and more in-depth scientific research and to develop appropriate technologies for industrial processing, in order to make fully available these foods to the final consumers.

Keywords: insects, food, commercial maturity, nutritional aspects

SYSTEM APPROACH TO QUALITY AND ENVIRONMENTAL MANAGEMENT SINCE 2015 - REVOLUTIONARY OR EVOLUTIONARY CHANGES?

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Quality and environmental management systems are popular worldwide. At present 1,101,272 organization have implemented and certified the quality management system in compliance with the ISO 9001 standard. The environmental management system in compliance with the ISO 14001 has been implemented and certified by 285,844 organizations. The popularity of these management systems may also be observed in Poland there are over 12,000 ISO 9001 and over 2,000 ISO 14001 certificates registered (ISO Survey 2012). Due to stable attractiveness of the certificate the International Organization for Standardization (ISO) continues to introduce updates into the present versions of both standards, adjust them to the requirements of a modern organization and attempts to simplify the integration of the ISO 9001 and ISO 14001 standards into one quality and environmental management system. The concepts of the ISO 9001:2015 and ISO 14001:2015 standards are at the final stage of preparation. Therefore, through the analysis of these two concepts we may state that the standards will be more compatible with other management systems. The aim of the present paper is to illustrate the planned changes in the ISO 9001 and ISO 14001 standards. Furthermore, we will try to indicate if the changes are revolutionary or evolutionary in the process of implementation in a given organization.

Keywords: quality management system, environmental management system, ISO 9001:2015, ISO 14001:2015, risk management

COMMODITY SCIENCE IN THE AGE OF GLOBALIZATION

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Almost five hundred years have passed since the opening in Europe the first department of commodity science at the University of Padua, which was established in 1222 in Italy. Together with the University of Bologna these two universities created the basis for the emergence and development of higher university education and science in the world. The opening and formation of above mentioned department happened during the period of the development of commodity production, which promoted the extension of trade relations, trade information exchange, the development of the methods of goods research, accumulation of information about the properties of the investigated commodity science objects. The department activity investigative results were of the information-descriptive character that is why this period in the history of commodity research was called descriptive as the first (early XVI century and to the early XVIII century). The investigations at this stage were aimed at the research of pharmaceutical products properties, the purpose and methods of their usage. These and other trends of scientific research have been already practiced in technical sciences in particular, in engineering sciences technologies. This situation encouraged commodity exploration works to implement the technological methods of research in the commodity sphere. This period was usually called commodity and technological (early XVIII to the middle XX century) in the history of commodity science. At the second stage, the subject of investigation of wide range of objects is being extended: raw materials, semi finished products; methods and commodity research tools are being improved; processing and generalization of the experiments results are being made. Commodity science is enriched by the information base, computer technology, etc. At this stage, departments and laboratories considerably increase the volumes of research of raw materials and finished goods features while preparing to the solving of problems of quality products.

Keywords: commodity science, object, subject, investigation, globalization

EXPANDING OF RAW MATERIAL BASE OF MINERAL FILLERS FOR WATER-DISPERSION PAINTS IN UKRAINE

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One of the trends of paints market in Ukraine is growing demand for water-dispersion paints. This is due to its safety for consumers' health and environment. During the last ten years the share of water-dispersion paints in the structure of paints production in Ukraine is constantly increasing and now stands at 45.6%. Its share in the structure of paints consumption in Ukraine has risen to 42.6%. However these figures are much lower than in the EU. One of the problems of Ukrainian paint industry is unstable market of domestic raw materials. Much of the local raw materials, which can be used for paints, exported from Ukraine. These are primarily white fillers such as kaolin and carbonates, whose use in paint compositions significantly reduce production costs. Ukraine is rich in carbonates and kaolin: there are 66 deposits of carbonates and 35 kaolin deposits, 47 of which are developed. Comprehensive studies of the structure and properties of domestic kaolin and carbonates directed on realization its potential as mineral fillers in the composition of water-dispersion paints. The researches of changes in the state of kaolin and carbonates surface are performed in order to obtain optimal characteristics of fillers for water-dispersion paints. The state of mineral fillers surface changes with the help of modification by a variety of chemical compounds. Modification of carbonates and kaolin by surfactants is an effective method of activation its surface. It allows adjusting the parameters of the interaction of fillers with polymers, improving the distribution of fillers particles and wettability of fillers by polymer. Absolute safety, granulometric characteristics, witness and significant reserves of kaolin and carbonates in Ukraine permit these minerals to form the basis of raw materials for water-dispersion paints of different assignment with improved consumer properties.

Keywords: carbonates, kaolin, water-dispersion paints, modification

EFFICACY OF ORGANOSILICON COMPOUNDS FOR TREATMENT OF NATURAL STONE

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The durability of buildings depends on many factors, most important of which is the level of building stone protection from aggressive environmental influences, especially water. The solution to this problem is possible by the use of the materials and structures of polymers that are resistant to environmental factors and chemically aggressive agents. Organosilicone compounds are widely used to increase the hydrophobic properties of natural stone. Comparative assessment of the efficacy of silicone impregnating agents is carried out in regard of operational and technological aspects, as well as assessment of physical - technical properties of impregnated materials. To assess objectively the effectiveness of the use of organosilicone products for waterproofing of porous natural stone the following criteria were selected: the optimal concentration, water-repellent properties of the surface (with boundary wetting angles) and material in general (water and moisture), air permeability and adhesion to masonry mortar. Comparative evaluation of the efficacy of individual organosilicon compounds for impregnation of porous non-metallic materials by comparing of physical - technical, technological and operational characteristics, environmental safety and toxicity allowed to identify the most effective among them. At the same time, the ambiguity of the impact of these compounds on mechanical strength and water-repellent properties of the impregnated material leads to the search of more effective ways to use them . One of these ways may be the use of two - and threecomponent mixtures based on sylikonats of alkali metals and ethylsilicatehydrolysates. Thus the combination of these compounds in the impregnating complex offers to improve physical - technical properties of non-metallic materials.

Keywords: stone protection, organosilicon compounds, waterproofing

HIGH FREQUENCY TRADING: POLICY AND ETHICS

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Algorithm trading enables market participants to collect information from multiple markets and to receive trading instruction at very high-speed. High frequency trading (HFT) is a type of algorithm trading characterised by ultralow latency connection. Technologies allow firms that have enforced HFT to implement profitable strategies because they are able to perceive, to assess, and to react to market inputs in real time. In the last years, the share of activities carried out using this algorithm has significantly increased. It has ranged between 10% and 40% in the main European countries. The objective of this work is to provide a description of HFT illustrating the technological aspects that determine the competitive advantages for users and the impacts that might affect the markets. The article is structured in four sections. In the first section, we describe HFT operational characteristics providing an overview of trading strategies that can be adopted. Then the main approaches present in literature which are used to identify HFT activities and their limits are illustrated. In the second section, the main risks due to the spread of these instruments that may involve the efficiency and integrity of the market are presented. There are also considered the possible implications of the combined use of HFT with other instruments aimed at lowering latency, such as *naked access* to market. In the third part the evolution of regulatory framework implemented by European Commission it is analysed, focusing on the objectives that will be pursued by update rules for market in financial instruments (MiFID II). Finally we discuss if ethics in finance could fill the gap that exists between technological progress and regulatory development.

Keywords: High frequency trading, market risks, financial ethics

FACTORS THAT INFLUENCE ACRYLAMIDE CONTENT IN CEREAL-BASED BABY FOODS

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One of the latest neurotoxic and carcinogenic substances discovered in food is acrylamide (AA). This study was aimed to evaluate the effects of certain additives, pH, water activity and contents of cereal-based baby foods components on the acrylamide formation. In particular, the effects of natural components (sugars, amino acids, ascorbic acid) were evaluated. The possible role of iron and calcium ions in the formation of acrylamide, were also examined. The study was conducted in order to design strategies to prevent or decrease the extent of AA formation in baby foods. The formation of AA was investigated in model systems based on asparagine and saccharides (glucose, fructose and lactose or saccharose). The content of acrylamide after heating was examined with regard to the following parameters: heating time and temperature, pH, water activity and various components contents. Prepared model systems with different molar ratios of asparagine and sugars and using modification of pH, water activity and different contents of additives (iron and calcium ions, ascorbic acid, lysine) were heat treated in the temperature range of 100 – 200 °C for 1 – 60 min. The results showed that the presence of asparagine was the main condition for acrylamide formation in foods. It was also found that the addition of other amino acids (lysine) caused a reduction in AA formation, probably by promoting competing reactions and/or covalent binding of formed acrylamide. The lowest acrylamide content was found for heat treatment at 120 °C and the highest at 180 °C. Fructose is more reactive at lower temperatures (120 °C) than glucose, which reacts more intensively only at 140 °C and 180 °C. Temperature was found to be more important than time of the heating for the intensity of AA formation. The acrylamide formation was the highest at pH around 8. Lower pH slowed down its formation. The optimum water activity for acrylamide formation was 0.3 – 0.7. The study showed, that it is possible to reduce acrylamide content even up to 70 - 80% in model systems. This work was supported by the Polish Committee for Scientific Research (project no. N N312 227236, 2272/B/P01/2009/36).

Keywords: acrylamide, baby foods, model systems, factors, formation

LABELLING OF GENETICALLY MODIFIED FOOD PRODUCTS

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The EU recognizes the consumers' right to information and labelling as a tool for making an aware choice. Since 1997 Community legislation has made labelling of GM food mandatory for products that consist of GMO or contain GMO and for products derived from GMO but no longer containing GMO if there is still DNA or protein resulting from the genetic modification present. Due to the EU Regulation 1829/2003 on genetically modified food and feed all food or feed that contains greater than 0.9% of approved GMOs must be labelled. It is especially important in the context of the fact that the great majority of European consumers has shown and still shows a clear preference for non-GMO products. Main aim of the paper was to present the basic EU requirements on labelling of GM foods. In the experimental part of the paper the packages of 75 food products available in Cracow hypermarkets potentially containing GMO or produced with GM engineering techniques were analysed in the context of presence of the appropriate label. Special attention was paid to soybean products as soy protein play very important role in the foodstuffs manufacturing and the EU imports 35 to 40 million tones of soy annually, while about 90% of it is GM. Consumers' attitude towards foodstuffs with the label "with GMO" and "GMO free" was also determined on the basis of the survey carried out in Malopolska Region on February 2014. To conclude the results of conducted analysis it has to be stated that producers avoid labelling of food products with GMO on Polish market. Only 4 products with the label indicating the use of genetic modification were found. The average consumer interprets such a label as a warning rather than as information about the application of genetic engineering. Many consumers prefer to choose products without GMO labels as they are meant to notify of health hazards. On the other hand GMO-free labels are more and more popular on the food products, however the rules of labelling products with them should be harmonized within the EU. We should keep in mind that genetic engineering is a very broad field, and even when organisations, producers, and retailers use the term "GMO-free", genetic engineering often is involved nonetheless. Therefore, even supermarkets with no products labelled as GMOs may not be free from all types of genetic engineering.

Keywords: GMO food products' labelling, soy bean products, consumers' attitude towards GMOs labelling

A SOCIO-ECOLOGICAL STUDY ON PLASMA DISPLAY PANEL TVS

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The production of Plasma Display Panel TVs of Panasonic shall be entirely stopped at the end of March in 2014. Their useful managerial resources must be shifted to the production of Liquid Crystal Display TVs as quickly as possible. What is the most decisive point of defeat of PDP TVs? I would like to observe the past 10 years' technological and marketing developments among the well-known manufacturing corporations of Flat Panel TVs from a socio-ecological (economically, socially and culturally transient) viewpoint, focusing on Panasonic in this paper. Comparatively speaking, PDPs have been under the closed business architecture based on the integral division of labor, and LCDs have been under the open business architecture based on the horizontal division of labor. Therefore, LCDs have surpassed PDPs as for the marketable scale of economy. My academic conclusion is that Panasonic lost its eternal confidence in day-to-day innovative business spirits to create the more comfortable society with its sensitivity-oriented consumer durable products under the spread of the American-leading globalization based on rationalism and economic supremacy. Semantic and sensual attributes of Flat Panel TVs to enthuse and/or enrapture eyes and ears of the audience have been part of the social and cultural affluence. Are they fading out of our familiar consumer durables? It is a great pity that delicate sensitive value is being curtailed by rugged rational value incorporated in Flat Panel TVs. It is time for prosumers (passionately environment-conscious geek consumers) to regain and co-create aestheticism of consumer durables together with business corporations world-widely.

Keywords: socio-ecological study, Plasma Display Panel (PDP) TV, Liquid Crystal Display (LCD) TV, commoditization, de-commoditization

INNOVATION POTENTIAL – INDICATORS FOR SME

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Innovation can bring dynamics to a company, but an innovation does not come without an internal effort of a company. The effort must be active in preparing internal conditions for innovations, i.e. to create an environment for having a positive potential for innovations. The second issue is about ways of the innovation potential measurement. A potential as an ability is seen as a change between two statuses – existing one and desired one. An unused potential represent idle capacity of the company. The turbulent environment of economic life comes with more risks, but in opposite, with more chances, too. A risk can be seen as acts and results of negative activities, and a chance can be seen as opportunity realised by existing conditions and abilities. To discover a potential is also about chances and their discovering. An organisation is in a normal state when risks and chances are approximately balanced. The normal state has its boundaries represented by unusual situations. A potential is the difference, declination from a normal state; a difference from what is and what should be. The ongoing economic crisis creates both short- and long-term pressures to change orientation of SME. At same time, the organization lays the foundations of its long-term competitiveness by developing a combination of innovation, methods for streamlining the organization of work and increasing productivity. It is not enough to think and to meditate about an innovation and an innovation potential, but it is important to know how big or small it is, whether there are positive changes, how significant they can be, how effective effort of managers to increase it exists. There is a simple and straight need of a group of indicators who can measure the potential. The indicators can play a role of a mental bridge between what is now state and a future one using innovation and creativity. The article presents several tools related to innovation potential measurement in small medium-sized companies.

Keywords: innovation, potential, SME

THE “COSMOB QUALITAS PRAEMIUM”: A QUALITY BRAND IN THE ITALIAN FURNITURE SECTOR

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The “CONSORZIO DEL MOBILE”, well known as COSMOB s.p.a., is a specialized centre for wood-furniture, which supports the supply chain in their processes of development of competitiveness, providing technology solutions and services in the fields of quality, research and innovation. It is situated in the Province of Pesaro-Urbino (PU). The activity of COSMOB is focused on a range of specific directions:

- activity of innovation,
- activity of training,
- activity of auditing,
- activity of internationalization,
- technical activity of laboratory.

As part of a strategy to promote and support the development of the competitiveness of companies in the wood and furniture industry, the COSMOB has launched an initiative to develop their products on the domestic and international market, establishing the brand "COSMOB QUALITAS PRAEMIUM". It is awarded to companies that provide their customers with the respect of the product characteristics specified by COSMOB particularly as qualifying. The CQP, for the certified company, involves commercial and technical benefits. The brand allows on the one hand to monitor the production and to increase the productive effectiveness, also thanks to the identification of waste and the optimization of the using of resources, as well as through a process of mutual learning linked to the interaction with the technician of COSMOB. On the other hand, instead, it can be a substantial and effective tool of marketing and communication that can lead to a strong improvement of the firm image, as well as the creation of a competitive advantage towards the competitors, connected to the ability to catch a growing demand. In this paper the authors will analyse the CQP brand, its features and its diffusion and how it can be used by the companies.

Keywords: quality system, wood furniture, quality brand

QUALITY ASSESSMENT OF FEATHER-DOWN RAW STUFF USED AS FILLING MATERIAL FOR BEDDING

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Research Aim Establishment. Bedding ability to create comfortable conditions for full-fledged resting and to protect human body from environmental negative effects causes the necessity of valuable feather-down raw stuff range diversification. Materials and Methods. The research objects are feather-down raw materials used as traditional stuffing for bedding (quilts, pillows etc.). These bedding products are manufactured by Gerd Billerbeck GmbH Ltd. (Ukraine). Researching physicochemical parameters of feather-down stuffing materials quality the authors used standard methods. Research Results. Feather-down raw material is plumage received after killed or living birds plucking. Plumage is a bird's collective feathers and a quill is any of the flat appendages growing from a bird's skin and forming its plumage consisting of a partly hollow horny shaft fringed with vanes of barbs. Down is the layer of light fluffy clusters that is the undercoating, closest to the skin of birds. Using selected raw materials Gerd Billerbeck GmbH Ltd. gets high quality rates of feather-down stuffing. To be competitive on the market the company selects the best raw material i.e. goose feathers and down which are very light and thermo-insulating. Purchasing raw material the company selects it thoroughly and then carefully processes and checks its quality. The researchers define feather-down raw material quality as a result of organoleptic and physicochemical investigations. Usually they define the following parameters: appearance, smell, mass fraction of moisture, mass fraction of components, mass fraction of waste products and mass fraction of dow. Conclusion. The authors have assessed the quality of bedding stuffing feather-down raw material by means of standard methods and defined that the material corresponds to the currently in force normative documents and is valuable stuffing due to its quality and characteristics.

Keywords: feather-down raw materials, a quill, down, classification, quality demands, feather-down material quality

ANTIOXIDANT CAPACITY OF SELECTED COMMERCIAL SPICES

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Aside from ability of food aromatizing spices have good antioxidant properties and they are used as preservative agents in food. Different specific antioxidants accept basic ones are present in spices e.g. piperine in black pepper, gigerol and zingerone in ginger, thymol and carvacrol in majoram. The research material consisted of the following dried spices from different parts of plant: leaf- marjoram [*Origanum Majorana L.*], rhizome- ginger [*Zingiber officinale Roscoe*], fruit- black pepper [*Piper nigrum*], bark- cinnamon [*Cinnamomum verum*]. 47 samples were collected from the Tricity market and investigated. Aim of this study was to evaluate antioxidant properties of those spices. The total phenolic content was determined by Folin – Ciocalteu method. Antioxidant activity was determined using the DPPH reagent and showed as DPPH radical scavenging percent. The total phenolic content in the studied samples was variable, ranged from 10,7mg in black pepper to 942,6 mg GAE/ g in cinnamon. The analyzed spices samples characterized different levels of the radical DPPH – scavenging, they had values from 34,83 % for ginger to 90,8% for cinnamon. The analysis of variance ANOVA showed a statistically significant influence of the producer on the content of total phenolic content in all investigated groups of spices. Research confirms that the investigated spices are a potential source of antioxidant, their origin from different part of plant and producers have impact on the total polyphenol content and the ability to neutralize free DPPH radicals.

Keywords: spices, antioxidant capacity, total phenolic content

STUDY REGARDING THE SATISFACTION OF STUDENTS IN THE BUCHAREST ACADEMY OF ECONOMIC STUDIES, TOWARDS THE CHANGES REGISTERED IN THE ROMANIAN ECONOMIC HIGHER LEARNING

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The universities in our country, like others in Europe, pass through major changes that must help them meet more and more important challenges. The last decade has been marked by changes produced in the higher learning institutions in European countries, following the transformations generated by the Bologna Process in the academic world. In Austria, Spain, Germany different initiatives regarding the way of making change happen in higher learning institutions have taken place. Keeping this in mind we considered as necessary an analysis of the opinion of academic educational services consumers in Romania, linked to the changes registered following this reform. We were interested especially in the opinions of the students which follow the courses of the Bucharest Academy of Economic Studies (the most prestigious Romanian institution of this type, which has marked a century of existence last year). The paradigm change, from the traditional perspective on education towards a knowledge society perspective implies the need for higher and higher competitiveness of the educational systems. In this direction, universities must work together frequently with other research institutions, and also with private enterprises and public institutions, and take part in international research networks. This research represents something new for the Romanian academic environment, because such an analysis has not been made before on the level of the economic university environment. The opinion of economist students matter, from our point of view – because along with the employers on the job market, they represent the real consumers of educational services. Furthermore publishing of separate reports by the Romanian universities regarding their own activity and aligning to changes imposed by the Bologna Process will increase their visibility on a national and international level and will allow interested parties to make comparisons with other universities themselves, in opposition to only being guided by hierarchies done by various institutes.

Keywords: consumer satisfaction, educational services, students, university, Bologna Process

CAPACITY OF ECOINNOVATION DEVELOPMENT IN POLISH MANUFACTURING SECTOR – SMALL EVIDENCE FROM EMPIRICAL STUDIES

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The objective of the paper is to present the paths of ecoinnovation development in Polish manufacturing enterprises. In order to investigate these paths the results of survey are used. The survey was made within the project titled “Ecological policies of companies” that was realized by Department of Product Technology and Ecology of Cracow University of Economics in the years 2011-2013. Survey results are adopted to use rough set approach to induce decision rules on ecoinnovation. The process of inducing decision rules is based on the assumption that ecoinnovation are purposefully developed and implemented in companies due to their potential of achieving significant environmental performance improvement together with the economic benefits. The companies are classified into two groups: ecoinnovators and non-innovators and variables describing their environmental and overall performance are used as attributes in defining their decision rules. Rough set theory is used to induce main decision rules of ecoinnovators and non-innovators and to identify major conditions of successful ecoinnovation implementation. The set of companies consists of 56 units and each one of them is characterized by number of conditions attributes and their parameters that are determining their belonging to one of the classes (eco-innovators and non-innovators). The decision rules that are induced consist of number of parameters of condition attributes and settle the criteria for implementing ecoinnovation in manufacturing sector.

Keywords: ecoinnovation, decision rules, rough set approach, manufacturing sector

PRODUCT LIFE CYCLE THEORY IN THE CONTEXT OF ECOLOGICAL ASSESSMENT METHODS

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The objective of the paper is to present the origins of life cycle assessments methodology from the perspective of product life cycle theory. Market life cycle of a product has been a milestone for the development of product strategy, orientate product research and consumer preferences. Its background relates the phases of product life cycle to its market performance and its recognition from the perspective of actual and potential consumers. The concept of ecological life cycle is evidently based on product life cycle theory but it uses different approach to define life cycle phases. These phases are modelled in a way that encompass their total environmental burden but do not relate them to their market performance and perception. This slight difference in defining life cycle is responsible for major difference in practical application of both concepts. Product life cycle research needs market based information, mostly from use phase, while life cycle assessment relies on design originated information. The paper presents the major differences in defining life cycle phases in both these approaches and is focus on its consequences on research and assessment procedure. The paper also investigates the data acquirement strategies and information sources in both these approaches. Finally, the paper draws attention to the possible synergies between the two and proposes the assessment procedure that would meet the requirements of product life cycle analysis as well as life cycle assessment.

Keywords: life cycle theory, life cycle assessment, product life cycle, phases of life cycle

WIND ENERGY IN EU IN 2020 AND DEMAND FOR RARE EARTHS METALS: A PRELIMINARY ASSESSMENT

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In the coming decades, wind energy will give a growing contribution to the constant increase in the energy needs of mankind. This has also been shown by the National Action Plans for Renewable Energy (NAP), adopted by all EU Member States in compliance with Directive 2009/28/EC. The total wind power capacity installed in EU member States in 2020 is expected to exceed 213 GW, compared to just over 100 GW existing. The technology of modern wind turbines, while boasting several decades of history and manifold innovations, has to be considered not yet fully mature. The machines on the market are based on several technological approaches, and even when the most advantageous technology is identified, it will only come to cover the market gradually. Currently, the technology that seems to have the best requirements, allowing the production of ever more powerful machines, uses permanent magnets to convert mechanical energy into electricity. The peculiar features of these magnets are due to some metals, belonging to the rare earths group, used in the metal alloy constituting the magnet. These metals are currently produced almost exclusively in China, although they are relatively widespread on the planet – a situation that does not seem to be going to change in the next few years. Because of this, it is paramount to carefully assess how much of the stated aims of the NAPs as regards the major growth of wind installations can actually be implemented in Europe, which is totally dependent on imports of such materials. Taking into account the objectives set out in the NAPs of EU Member States concerning the development of wind installations, the technologies currently employed and those being tested, this paper provides an estimate of the annual and cumulative demand up to 2020 of metals of the group of rare earths used in wind turbines.

Keywords: wind energy - rare earths - permanent magnet - EU's climate change package

INCLUDING EXTERNAL COSTS IN ENERGY SECTOR. HOW WOULD THEY CHANGE COST-COMPETITIVENESS OF DIFFERENT ENERGY SOURCES?

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The world is currently witnessing high increase of energy demand mainly because of relatively high population growth and increasing global life standard. That causes highly negative environmental constraints since more people with higher life standard need more goods, commodities and use more energy. The energy production, especially energy produced from specific conventional energy sources, is very intense polluter and causes high environmental impacts. Therefore new energy infrastructure – especially new energy production facilities must be carefully designed and planned and their cost competitiveness must be studied in details. Along with more traditional studies, considering mainly investment and production costs, external costs must also be taken into account when making feasibility study of a new power plant. Considering also external costs may be essential for efficient long term re-evaluation of different energy sources and different technologies used in energy industry as well as for different types of energy power plants and other projects related with energy industry. The inclusion of external costs shows us the way to evaluate energy systems with inclusion of all environmental and social costs released in energy industry. In this paper we are studying if renewable energy sources are competitive to conventional energy sources if we internalize external costs as well. Different energy sources are cross-compared and their economics both with excluded and included external costs is discussed. The study is made on the basis of average external costs evaluations made for European States. We assume that competitiveness of renewables would change dramatically if all costs, especially external, are taken into account and considered in feasibility studies of new power plants.

Keywords: external costs, production costs, energy, polluter pays principle

FIRE SAFETY OF PORTIERE FABRICS

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The article reflects the need to improve the flame retardant properties of portiere fabrics to ensure their fire safety. Research results of flammability indexes of portiere fabrics with different fibrous composition before and after processing with a flame retardant are shown. The aim of the research is to study flammability indexes of portiere fabrics before and after the fire-retardant processing. Tests on portiere fabrics flammability before fire-retardant processing showed their nonconformity with the specified requirements and confirmed the need for fire protection. On the basis of the conducted research it is proposed to use the new flame retardant Flame Stop for the processing of portiere fabrics of different fibrous composition. It will improve their fireproof properties due to the high content of phosphorus and nitrogen in aminotrimethylenphosphonic acid, neutralized with ammonia with the addition of a foaming agent. There has been found out the optimal concentration of the active substance in the retardant Flame Stop to make portiere fabrics of different fibrous composition hardly flammable. It is shown that the indicators of tensile strength of portiere fabrics processed by Flame Stop almost do not differ from the corresponding indexes determined before processing and correspond to the specified requirements. There has been proved the possibility of using chemical cleaning to care about portiere fabrics processed by Flame Stop, preserving their flame retardant properties.

Keywords: portiere fabrics, fire safety, flame retardants, flammability indexes

CHANGES IN PHYSOCOCHEMICAL PARAMETERS OF ARGAN OIL DURING MICROWAVE HEATING

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The purpose of the research was to analyse oxidase changes in argan oil induced by microwave heating at a power of 200, 400, 600, and 800 W. The object of research was argan oil. It is a vegetable oil characterised by high content of tocopherols (vitamine E), phytosterols, NNKT. Argan oil comes from Morocco and is valued for its nutritional and pharmaceutical qualities. Microwave heating of oil samples results in increase of the oil temperature. Maximum temperatures observed depended on the microwave power. The higher the microwave power, the higher the temperatures of oil samples. For example, 135-138°C (200W) and 226-230°C (800W). As a result of microwave heating, peroxide values increased over time. The longer the time of heating, the larger the number of hydroperoxides formed in the samples microwave heated at the power of 200 W. The values recorded ranged between 0.68 and 8.80 mEq O₂/kg. Longer heating at higher powers (400-800 W) for a period exceeding 6 minutes did not result in any considerable increase of peroxide value. This is due to the decomposition of hydroperoxides into secondary products. The presence of secondary products of argan oil oxidation was determined on the basis of changes of the anisidine value. The amount of secondary products of oxidation formed depended on the microwave power. Secondary products of oxidation were formed in samples microwave heated at the power of 400-800 W. The values of this parameter were much higher and equalled: 25.3-48.6 after 18 minutes. (400 W), 22.8-64.0 after 12 minutes. (600 W), 23.1-69.5 after 9 minutes. (800 W). The Totox values increased with time, similarly to the anisidine value. The acid values and iodine values in the samples of argan oil changed insignificantly throughout the heating process.

Keywords: argan oil, microwave heating, oxidative changes

NORMATIVE REGULATION REQUIREMENTS FOR QUALITY PACKING PAPER IN UKRAINE

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In recent years the problem of quality products are crucial in all sectors of the economy. This especially applies to foods. In such circumstances, the important role of maintaining quality in the goods movement which is primarily provided by the use of modern packaging. The quality of paper packaging in Ukraine is regulated by several regulations, but they provide requirements that can not always ensure the implementation of even the basic functions of packaging - protect products from the effects of destructive complex factors. They include generalized standards of quality indicators wrapping paper for all foods, not taking into account the specific features of each product. Among the indicators are normalized only: mass of 1 m², breaking length, relative resistance to bursting, greaseproofness, water vapor permeability, whiteness, humidity and moisture. Moreover, even these figures are not standardized for each type of paper packaging materials. By packaging materials intended for contact with food should be nominated the most stringent requirements. Packaging material in the first place, must be harmless and meet the following requirements:

- lack of migration of materials into food substances that impair the sensing properties,
- lack of selection of packaging material chemicals in concentrations that can damage the health in case of them in the body,
- packaging materials must not encourage the development of microorganisms in foods,
- packaging materials must not change the nutritional value of foods.

Also important indicators of wrapping paper, the requirements of which must necessarily be governed by regulations, are indicators of the stability of paper to mechanical stress, indicators of chemical resistance, the ability to allow fluids and gases, process parameters and the possibility of recycling of packaging material.

Keywords: packing paper, the properties, quality, regulatory document

EVALUATION OF CHANGES IN MELTING AND OVERRUN OF FAMILY ICE CREAM DURING LONG-TERM STORAGE

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Ice cream have a high nutritional value and rich taste values. They have a refreshing effect, so they are willingly consumed, especially by children and adolescents. Ice cream is not only tasty dessert, but also a source of many valuable nutrients. Currently, these products are considered to be universal food consumption. Their particular preferences in nutrition due with high digestibility and bioavailability, nutritional quality, diversity of products used in flavors. Ice quality is obtained with the highest quality of carefully selected ingredients. Proper selection of the components determines the quality, taste and smell, texture, consistency, bulkiness, resistance to temperature fluctuation, attractive appearance, ease of formulation, freezing temperature, nutritional and refreshing properties. The high level of quality ice can be taken when storing only under strict conditions - temperatures low and the maintenance of a constant level. Ice cream is a frozen product which may be subjected to long-term storage. The key question therefore is whether in such a long time, the quality does not change. Therefore, this work was taken in an attempt to assess the impact of long-term storage at different temperatures on changes in two important quality features which are overrun and melting behavior of ice cream. It was found that the highest growth rate of ice cream characterized by a variable stored in conditions of temperature and characterized by the best quality ice cream stored at -30 ° C. Ice cream at the recommended storage temperature of -18 ° C should retain high quality for 2 years, and studies have shown that ice cream stored at this temperature retained the highest quality for 3 months.

Keywords: ice cream, long-term storage, melting, overrun, temperature fluctuation

INNOVATION BY DESIGN AS AN ESSENTIAL CONNECTION BETWEEN TECHNOLOGY AND MARKET

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The current economic era is a fertile environment for the continuous increases of the difficulties companies face in their search for an effective resource management. Pressured into meeting the requirements of both consumers and investors, companies are constrained to find the balance point between radical innovation and sustainable innovation that enables them to promote salient innovation while referring to the technological limits found within the consumer's needs. The companies' failure that exceeded this technology market level through radical innovation, or those who have failed to highlight among consumers the technological advances of products, may point to the conclusion that innovation by design can be one of the main solutions to keep the innovation process within the limits of consumer needs while still advancing new technological features. Within this background, the current paper aims to identify the extent to which innovation by design can provide a real and sustainable connection between technological innovation and market requirements. In order to achieve this goal, a questionnaire research tool was used so as to determine the contribution that design has in highlighting innovation effects, and the extent to which innovation by design creates added value for the consumer, extra value for which they are willing to pay more. The research conducted showed that design has a significant influence on consumers' perception of a product innovation degree simultaneously with the conclusion that design has a fundamental role in revealing a product technological improvements. This approach contributes to establishing a theoretical framework of the innovation by design contribution in companies' approach to deliver new technology to the market in order to respond appropriately to the consumers' needs.

Keywords: design, innovation, consumer, market, technology

THE EFFECT OF GAS COMPOSITION IN MODIFIED ATMOSPHERE PACKAGING ON THE SHELF LIFE OF PORTIONED RIPENED CHEESE

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The aim of this study was to determine the shelf-life of Dutch cheese (200 g portions) packed into plastic bags (PA//PA//PE/PE-EVA Combitherm, 70 µm thick) by four methods: ambient air + oxygen absorber, modified atmosphere (MAP 30% CO₂/70% N₂), modified atmosphere (MAP 30% CO₂/70% N₂) + oxygen absorber, ambient air (control sample). Cheese samples were stored at 60°C for 30, 60 and 90 days. The gas composition inside the package was analyzed, the counts of coliform bacteria, yeasts and molds in cheese were determined, and an organoleptic evaluation was carried out immediately after packaging and after the specified storage periods. All packaging methods modified the internal atmosphere composition of the package, thus affecting the shelf-life and sensory attributes of cheese. Cheese samples packaged in modified atmosphere by the traditional method were characterized by the smallest changes in microbiological quality and the longest shelf-life. The highest increase in microbial counts and a decline in sensory quality were noted in air-packaged samples. Oxygen absorbers had no significant effect on prolonging the shelf-life of cheese.

Keywords: atmosphere composition, Dutch cheese, shelf-life, package

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CENTRAL AND EASTERN EUROPE CONSUMER'S CONFIDENCE IN THE EUROPEAN DIGITAL SINGLE MARKET

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The European Single Market is an ongoing project that will further continue to develop and adapt to changing realities. Traditional economic activities and the administrative rules governing them face the challenge of adapting to developments that blur the dividing lines, for example, between shop and online sales or between traditional media and Internet communication. Convergence of this type will lead to a European Digital Single Market. A genuine Digital Single Market would generate new types of growth and also sustainable economic and social benefits for all European citizens. Europe needs a new economic momentum to help its economies to exit from the economic and financial crisis and to boost long-term growth rates and competitiveness. This will be especially important for the economies of Central and Eastern Europe as the Digital Single Market could provide a large market in fields and sectors where these countries could potentially develop their competitive advantage. The Digital Single Market requires the review of certain rules whose relevance or effectiveness may be undermined by technological developments, or call for new accompanying policies. Much has already been done at the European Union and national levels to introduce a well-functioning framework for the digital economy. There are still a number of barriers against the development of the digital market in Europe. Obstacles which can be identified include national differences regarding data protection rules, e-commerce rules, consumer protection rules and other legislation pertaining to information flows. Improving consumer confidence in cross-border shopping online by taking appropriate policy action could provide a major boost to economic growth in Europe. Starting from the results of the Flash Euro-barometer survey „Consumer attitudes towards cross-border trade and consumer protection”, this study presents Central and Eastern European consumers' readiness for the European Digital Single Market.

Keywords: consumer's confidence, consumer protection, e-commerce, digital single market

THE CONTRIBUTION OF MARITIME TRANSPORT TO SUSTAINABLE DEVELOPMENT

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The international shipping industry directly facilitates the growth of world trade, economic development and improvement of global living standards. The volume of maritime trade is therefore expected to increase significantly as the world economy and population continue to expand. International maritime transport is the principal carrier for the movement of more than 90 % of global trade. Without cost efficient maritime transport, the movement of raw materials and energy in bulk to wherever they are needed, and the transport of manufactured goods and products between the continents would simply not be possible. Maritime transport (shipping industry) already contributes significantly to the three pillars of sustainable development-social, environmental and economic. The ship operation, operation of maritime management system, port and multi-modal connections are all components of maritime transportation system and have a part to play in defining and achieving a sustainable development. The shipping industry is focussed on addressing climate change by reducing and eliminate adverse impacts by shipping on the environment by identifying and addressing possible adverse and increasing the emphasis on the role of the human element in environmentally sound shipping. The highest priority of the shipping industry remains the safety of life at sea. It is anticipated that the sustainable development goals will also address issues such as seafarer training, improvements to navigational safety and promotion of an effective safety culture. In the paper are identified the main areas that should be addressed if maritime sustainable development is to be achieved. The concept of sustainable maritime transport should include a set of goals and actions and focus on: development and implementation of global standards, increase in energy efficiency, promotion of the new technology, improvement of maritime security, enhancement of maritime traffic management and improvement of maritime infrastructure.

Keywords: sustainable development, maritime transport

EVOLUTION OF EUROPEAN BIOFUELS POLICY: ADDRESSING SUSTAINABILITY AND INDIRECT LAND-USE CHANGE

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The aim of this paper is to review the European biofuels strategy implemented to reduce the impact of the transport sector in terms of GHG emissions by 2020 and also to verify whether today's targets have been met. Considering that in early 2000s the transport sector accounted for more than 30% of energy consumption, with a rate of dependency from fossil fuels of 98%, the Community, with the *Directive 2003/30/EC*, recognized the potential role of biofuel in reducing sector's GHG emissions. It was required to ensure a minimum proportion of biofuels and other renewable fuels in the market, of 2% by 2005 and 5,75% by 2010. With the *RED* (Renewable Energy Directive), it is mandatory to reach a target of 20% share of energy from renewable sources in Community energy consumption by 2020. Since the EU goal is to reduce GHG emissions in Europe, a part of this strategy is to use at least 10% of renewable energy by 2020 in Europe's transport sector. Moreover, biofuels represent a vast part of this strategy in the *RED* and it sets a 10% minimum target of share in transport diesel and petrol consumption. Another important reference document is the *Fuel and Quality Directive*, amended by *Directive 2009/30/EC*, where the target for the reduction of GHG emission of petrol and diesel fuels is added. The aim is to gradually reduce life cycle greenhouse gas emissions by up to 10 % per unit of energy from fuel and energy supplied. The set target is to reduce the amount of at least 6% by 2020, compared to the EU-average level of life cycle GHG gas emissions of energy from fossil fuels in 2010, mainly through biofuels. RED and FQD, have three specific aims: reducing dependency on imports of crude oil and transportation fuels (security of supply); maintaining agricultural productivity incomes and employment preserving quality of life in rural areas; reducing transport-related GHG emissions by using sustainably produced biofuels.

Keywords: biofuel, Europe, RED, FQD, 2020 targets

CONCEPTUAL PRINCIPLES OF PRODUCT DEVELOPMENT FOR ENTERAL NUTRITION

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Patients' nutrition is one of the urgent and important problems of modern society. Analysis of current global and domestic scientific evidence suggests that the problem of nutritional needs of people with hyper metabolism with necessary nutrients can't be solved only by a simple substitution of protein, lipid, carbohydrate and vitamin and mineral costs. In this work the critical analysis of existing approaches to patients' nutrition has been conducted and a conceptual framework of development of products for enteral nutrition has been introduced. It was determined that the current total parenteral nutrition has significant advantages in providing calorage , positive nitrogen balance, maintaining weight, but during the examination, a number of complications appear. At the same time, many clinical studies have shown that enteral nutrition is more physiological, effective and safe, helps maintain digestive tract in normal physiological condition and prevent many complications. Developing products for nutritional support is based on current scientific research on balanced nutrient composition and its conformity to the specific needs of people with metabolic hyper metabolism. Modern mixes for enteral nutrition are mainly of two types: balanced (polymer), and modified. However, during using even the most advanced formula for enteral nutrition, especially in the early stages, there are some difficulties. Therefore, we carried out a systematic development a series of foods that would take into account the specific needs of the organism of patients throughout the period of treatment and rehabilitation, namely on the following stages: the early stage of treatment (immediately before and after surgery), intensive rehabilitation period , the main period of rehabilitation of people already recovering , remote recovery phase outside medical institutions (for patients with injuries requiring nutritional support for a long time).

Keywords: enteral nutrition, parenteral nutrition, nutritious mixture hyper metabolism

COW'S MILK - PRODUCTION, CONSUMPTION AND HEALTH PROMOTING COMPOUNDS

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In the last three decades, the world production of cow's milk has increased by more than 40%. The top ten producing countries accounted for more than 55% of 620 million tons in 2012. More than 6 billion people on the globe consume this amount of milk. The majority of milk consumers live in developing countries, however per capita consumption is higher in developed countries. The high nutritional value of milk is widely recognized all over the world. Increasing scientific and commercial interest has been focused lately on the health promoting properties of milk, in fact on properties of some of its components. The richest in bioactive compounds is protein fraction of milk. Bioactive peptides have demonstrated specific biological activities, such as antihypertensive, antimicrobial, opioid, antioxidant, immunomodulatory, or mineral binding. Beneficial effects on human health revealed also compounds present in milk fat fraction. Its main functional properties are following: anticarcinogenic, antidiabetic, antiatherogenic, antiobesity, immunomodulatory. Milk is also a rich source of B vitamins, vitamin D and number of minerals, including easily absorbed calcium. Some of the milk components have already been commercialized and used in dairy and nondairy food and even in pharmaceuticals. Thus the dairy industry has achieved a leading role in the development of functional foods. The article presents the overview on the world milk production and the components of milk, which play essential role in human health and nutrition.

Keywords: milk, bioactive components, production and consumption volume

MINERAL CONTENT IN TRADITIONAL AND CONVECTIONAL PORK MEAT AND PRODUCTS

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The EU, seeking the preservation of cultural identity, including culinary heritage, has introduced a system of regional and traditional products. This system is based on three categories: Protected Designation of Origin - products closely related to the area which name they bear; Protected Geographical Indication, which, in a specified Geographic Area, will concern production or processing or preparation and Traditional Speciality Guaranteed, a which needful condition is to describe the traditional product's character. Studies showed that southern European regions tended to associate the concept of "Traditional" more frequently with broad concepts dry as heritage, culture or history, and Central and Nordic regions focused on practical issues, mainly dry as comfort, health or propriety. Local and regional food are valuable assets in our bid to develop the kind of tourism and recreation associated with nature and culture. The aim of the study was to determine the differences in the content of iron, magnesium, calcium, potassium, and phosphorus in processed pork products from small local manufacturers and large-scale producers. The results indicate that sausage labelled "Culinary Heritage Warmia Mazury Powiśle" sign had a significantly higher iron content in comparison to similar products manufactured by other local producers and large plants. This paper presents the results of a study carried out as a part of a research project into a extensive quality evaluation local and regional products available in the province of Warmia and Mazury on the basis of health value and consumer opinions.

Keywords: traditional and local product, magnesium, calcium, iron, potassium, phosphorus

PRUNUS SPINOSA EXTRACTS

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Free radicals are atoms, groups of atoms or molecules with an odd number of unpaired electrons. They are probable everywhere in nature, in the air, our bodies, and the materials around us. Each organism has a defense system of antiradical species (known also as natural antioxidants) to prevent damage caused by free radicals. The antiradical species are molecules that are able to neutralize the free radicals by donating a hydrogen atom or electron to produce a relatively more stable radical with very poor ability in propagation of the chain reaction leading to the interruption of autoxidation process. Plant extracts are often rich in polyphenols. They have potential application in cosmetology and pharmacology. Recently they are frequently used also as food supplements. In most papers on application of plant extracts the first priority is given to the antioxidant properties of polyphenols. It is known that many polyphenols can act as cofactors for almost all kinds of enzymes. It is also important that polyphenols are present in anti-cellulite, anti-couperosis anti-aging and skin lightening products. In this work we deal with blackthorn (*Prunus spinosa*) which is a genus of trees and shrubs, which includes the cherries, peaches, plums, nectarines, apricots and almonds. The specific name *spinosa* is a Latin term indicating the pointed and thornlike spur shoots characteristic of this species. In the present work we study the variation of antiradical activity of extracts obtained from *Prunus spinosa*. We are looking for effective extrahent unable for preparation of extract with high polyphenols content of potential use as a cosmetic ingredient. The total content of the phenolic compounds present in the extracts was determined by means of standard spectrophotometric method using Folin–Ciocalteu reagent following the procedure described by Singleton and Rossi with caffeic acid. We have determined the content of flavonoids by means of a method proposed by Karadeniz *et al.* with (-)epicatechin as the reference compound. We have experimentally found that extracts obtained from the flowers of *Prunus spinosa* contain a significant amount of phenols including flavonoids. We can state that the flowers of *Prunus spinosa* can be regarded as a very valuable source of antiradical species, such as flavonoids and other polyphenols. Based on our experimental data one can conclude that the content of antiradical species in the extracts obtained using aqueous solutions of ethanol with 50% ethanol concentration is always higher than that found in the extracts obtained using water or ethanol.

Keywords: antiradical activity, *Prunus spinosa*, extracts

VITAMIN B₁ IN OAT GLUTEN-FREE PRODUCTS

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Gluten-free products are important and varied category on the market of food for particular nutritional uses. This category registered global value at US\$ 2.1 billion in 2013 with annual growth since 2009 up to 20%. Currently available grain products allowed for coeliac patients are made not only from traditional cereals: corn, rice and buckwheat, but also from relatively new crops like oat, amaranth, teff and quinoa. Oat was a subject of numerous studies on its safety on coeliac diet and is marked with a sign of crossed sword only for several years. Gluten-free products with oat were introduced on Polish market in 2012. The quality control of new gluten-free products is the subject of interest for food technologists and nutritionists, as the only effective treatment for coeliac disease is a lifelong gluten-free diet. The aim of the study was to determine the content of vitamin B₁ in all oat gluten-free products available on the Polish market in 2013. Seven oat gluten-free products: flours, bread mixes, cookies mixes and flakes were purchased in the local health food stores. The concentration of thiamine was determined by high performance liquid chromatography (HPLC) after prior enzymatic and acid extraction. Digestion with taka-diastase and acid hydrolysis were applied before modifying vitamin to its fluorescence form of thiochrome. The content of thiamine ranged from 0.07 to 0.28 mg in 100 g of product with a mean of 0.18 mg/100 g. The most valuable sources of vitamin B₁ were oat flakes (0.28 ± 0.01 mg/100 g) and oat flour (0.25 ± 0.02 mg/100 g), the least valuable were gluten-free flour with oat (0.07 ± 0.01 mg/100 g) and oat muffin mix (0.05 ± 0.00 mg/100 g). Tested gluten-free products differ in a vitamin B₁ content, which mostly was higher than in traditional gluten-free grain products. Therefore, from a nutritional point of view, oat products can be an important alternative to the previously consumed cereal gluten-free products.

Keywords: vitamin B₁, thiamine, coeliac disease, oat, HPLC

COMPUTER-AIDED LIFE CYCLE ANALYSIS FOR A METAL CONTAINER

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In the specialized literature the term “life cycle” is defined in various ways, especially with respect to the scope and aim of its assessment. When performing life cycle analysis for design purposes, taking into account all its stages, the considerations are initialized by pre-production phase when the product system is developed (product features and process) a virtual product is created. This is a model subjected to stimulation studies where various scenarios are analyzed to choose a structural form, material, power consumption, manufacturing methods and to specify environmental relations and technological and utility features. Including environmental aspects into product design and development requires also the life cycle to be prepared conceptionally. The production sphere being under special legal and institutional control is the best known area of Life Cycle Management since it is just considered to be the strongest source of environmental hazards. However, an impact on the environment and user occurs in the post-production phase due to product use. Such impact depends both on product design and manufacture quality and the user’s technical culture and ecological awareness. In this paper an example of LCA for an aluminum can. The production phase of the life cycle is analyzed due to its special importance for creating product quality. Life Cycle Analysis was carried out based on real input data gained from industrial practices. The aim of this paper is to point up possibilities of the product manufacturing process optimization, including reduction of adverse environmental impacts. In addition, the aim of this paper is to indicate possibilities of detecting the sources of adverse impacts during product life cycle in areas not covered by other types of manufacturing process analysis.

Keywords: Life Cycle Analysis, metal container

EXTENSION OF STORAGE DURATION OF SOME KINDS OF BREADS THROUGH RADURATION

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Objective of the present work was development of a method of raduration of the bread, as product of the most amenable to microbiological damage from the big moisture content. Object of research were samples of a forming loaf from wheat flour of the high, first and second type. For packing bread have been chosen plastic bag a film owing high physicochemical properties and stability to an irradiation in used by us dozes ($D\gamma=10,0$ kGy), that is within the limits of recommended international norms Codex Stan 1883 REV-2005 /10/. Processing of investigated samples of products spent on ^{60}Co to isotope installation K-120 000 with energy 1,25 MeV and capacity 1,0 Gy/sec. College of physical Researches HAH PA which energy too is in recommended limits of the international norms of CAC RCP 19-1979. Samples of a forming loaf processed various doses ($D\gamma =0,5-5,0$ kGy) scale of beams ^{60}Co isotope installation, control samples of bread didn't irradiated ($D\gamma=0$ kGy). After processing all bread (the control and processed samples) laid on storage in room conditions at non controllable temperature-humidity storage conditions. Before storage and in the end of an exposition except organoleptic, physicochemical and microbiological researches of bread were definition amino-acid structure is lead. Freshness of bread estimated on the accepted 5- point system. The received experimental material testifies, that the doze of an irradiation scale beams in $D\gamma=3,0-5,0$ kGy is optimum for processing bread from wheat flours of various type and increases shelf lives at 9-10 time in comparison with not processed samples and thus does not worsen o organoleptic and physicochemical parameters and does not lead to variation of nutritious properties. Due to deep disinfecting the developed method may be applied to an increase of shelf lives of bakery products, especially breads intended for a feed of various groups in conditions state of emergency situations: soldiers, participants of long expeditions and the population of the remote areas. It was shown that gamma ray ($D=3,0-5,0$ kGy) processing of breads made from different types of wheat significantly prolongs their storage duration about 10 times comparing to the controlling specimens. The method of raduration can be used for storage of bread in extreme conditions.

Keywords: gamma ray, period of storage, method of raduration

THE ASSESSMENT OF KNOWLEDGE OF THE ISO 10000 STANDARDS BY ORGANISATIONS THAT USE A QUALITY MANAGEMENT SYSTEM

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The ISO 10000 series of quality standards were introduced by the International Organization for Standardization ISO to support the ISO 9000 family of quality management standards. These standards explain in more details some crucial items especially those included in ISO 9001 used for certification of quality management systems. Their main objectives are providing the business environment with most important guidelines for achieving consistently high quality of services and products. The most important task of the ISO 10000 family of standards is to improve the effectiveness of organisation's quality management. The more effective quality management the more noticeable benefits from its application. These benefits consist in more effective use of resources, better risk management and improved customer satisfaction due to consistent supply of expected services and products. It should be noted that among all ISO 9000 series of standards, ISO 9001 contains the requirements that when fulfilled are sufficient for getting certificate by an organisation. In other words, the organisation must not use or even know of other standards of this series comprising detailed guidelines. Furthermore, the organisation must not know of the ISO 10000 family of quality standards often referred to as "circum-system" standards. Thus, a question has arisen to what extent the ISO 10000 family of standards is needful for organisations that have implemented a system consistent with the ISO 9001 standard requirements. The aim of the paper is to present the ISO 10000 series of standards and results of research related to knowledge and application of them by companies that implemented a quality management system in Poland. A study was carried out at 40 organisations, which were selected to represent different business areas. In research telephone polling was used and it was performed among respondents, who were management representatives responsible for the system, thus persons that should have a good knowledge of system and supporting standards. The research carried out indicated that relatively large number of organisations has no awareness of the existence of the ISO 10000 series of standards.

Keywords: ISO 10000 series of quality standards, quality management system, survey

MATERIALS USED IN FUNCTIONAL OUTERWEAR – CHARACTERISTICS AND CUSTOMER PREFERENCES

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The market offers consumers a wide variety of functional outerwear. The consumers interested in purchasing such products may select from various products that differ not only in design and fashion, but at the first place in the quality of materials used and finishing. The materials used in outdoor clothing should fulfil a series of requirements that seem to be mutually exclusive such as water resistance and water vapour permeability, wind resistance and air permeability, should be lightweight and durable as well as have appropriate aesthetic values. The mentioned properties are of utmost importance as they provide the user with physiological comfort when wearing clothing. The compilation of water resistance and water vapour permeability deciding on sweat removal from the near skin layer is a quite large challenge to manufacturers. The materials should be designed in such a way so that they do not pass raindrops, while being able to carry away moisture. There are many manufacturing techniques and technologies that enabling an outerwear to be obtained of all the properties mentioned above. The commercial offer includes products made out of various materials fulfilling the requirements outerwear from tightly woven fabrics made out of cotton yarns or microfibers to new generation laminates based on membranes or microporous coatings combined with woven or knitted fabrics. The aim of this paper is to present material and technological solutions used in sports outerwear, properties that have to distinguish them and the results of research on customer's purchase preferences in sports outerwear and their knowledge of characteristic properties of such clothing. The survey was performed by using the questionnaire addressed to the staff (merchants, salesmen) of sports and outdoor garment stores, including those offering one brand, a number of brands and outdoor clothing, located in large cities of Poland. The analysis of the survey results showed that despite of high prices there is a quite large number of people interested in purchasing outdoor clothing. According to employees of specialized sports and outdoor clothing stores, the vast majority of customers has sufficient knowledge about products they want to purchase.

Keywords: functional outerwear, physiological comfort, consumer preferences

A STUDY ON THE CREATIVE DESIGN EDUCATION METHOD BY APPLYING DESIGN METHODOLOGY: FOCUSING ON MIDDLE SCHOOL DESIGN EDUCATION PROGRAM

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Lately many kinds of design methodology is used in any other field as well as a study on design problem-solving process. This problem-solving process of every design field turns out in effective ways. Today design education program is trying to grow creativity problem solving abilities in various ways through convergence with other extra curriculums. Nevertheless it's lack of systematic frame with design methodology about design education. Design methodology is effective method in problem-solving process currently because is as being applied design thinking in management as well as design product, the company for inventive thinking. In this study we had simulated classes for middle school students by applying design methodology in new creative development methodology of education. We searched whether 'Design methodology' such as 'Creative toolkits', 'Mind map', 'Design thinking' which we applied is effective about drawing innovative idea as effectively solving complex problems that occur at each design step which we had into design methodology. This research was advanced with diving into three stages: Problem comprehension stage, Synthesize of the solution stage and Evaluation of the solution stage to apply appropriate methodology at each design process stages, also it applied design methodology through an experiment. It was enforced for total 45 students and verified through a survey. The significance of this research is that we can verify that it can be applied and extended as a problem-solving method in every sphere benefiting new things, life and companies and so on. We searched design methodology. In design education, the education we suggested one way for creativity problem-solving abilities by suggesting strategically such systematic design process stages.

Keywords: design methodology, design process, mind map, design thinking, design education

STUDY ON RELATIONSHIP BETWEEN EMPLOYEE VOLUNTEERING AND ORGANIZATIONAL COMMITMENT IN KOREA

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The purpose of this paper is to explore the relationship between the employee volunteering and organizational commitment in Korea. In general, employee volunteering is regarded as central Corporate Social Responsibility(CSR) activities of most enterprises. Although CSR is not the ultimate goal of enterprises, it is essential in sustainable business in community relations. According to a survey of the Foundation of Korean Industries (FKI), employee volunteering participation is active so that more than 50% of employees take part in volunteering activities in 127 companies (72.6% of respondent companies) in Korea. Most companies organize corporate volunteer support team and have various volunteer assistance policies and programs. Employee volunteering typically has the effects to spread the good images and brand of the companies and to formulate the organizational commitment and job satisfaction. In other words, employee volunteering contributes to community relation and positive culture in enterprises. There are many results on the financial analysis and consumer effects of employee volunteering on the basis of stockholders' perspective in Korea. Recently studies begin to show the inner stakeholder effects of employee volunteering such as productivity and morale of workers, organizational norms, organizational commitment and job satisfaction. In the same vein, this paper examines the relationship between the employee volunteering and organizational commitment by analyzing the cases of employee volunteers of a few companies in Korea. Based on the results, this paper presents the implications for effective goal establishment and volunteering program planning to maximize the inner stakeholder effects in enterprises in Korea.

Keywords: employee volunteering, organizational commitment, CSR, inner stakeholder effects

THE EFFECT OF SNS ATTITUDE TO INTERACTION - THE MODERATING EFFECT OF TIE STRENGTH -

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This research is carried out with the purpose of studying the effects of Social Network Service (SNS) users toward the interaction. Along with setting up the Tie strength, we assume that there exists a difference between Korean SNS users and Chinese SNS users. Users' attitude on the result of using SNS reveals remarkable effects on the interaction and certifies the moderating effect of the tie strength. Additionally, management policy of Korea and that of China have been verified, too.

Keywords: SNS attitude, interaction , Tie strength

THE EFFECT OF INFORMATION ABOUT LOWERING SALT CONTENT ON FLAVOR ACCEPTANCE OF SELECTED MEAT PRODUCTS

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The aim of the study was to assess the impact of information of a reduced salt content on the acceptance of the flavor in the selected assortment of meat products. The material consisted of sausages of varying salt content from a single manufacturer, available in retail. Evaluation of consumer acceptance was conducted among 100 young consumers declaring the consumption of the selected group of products. Differences in preferences to products of standard and reduced salt content were tested using the even method, before and after the disclosure of information about the type of product. Salty taste desirability in products of standard and a reduced salt content as well as determination of the expected palatability of the product was assessed using scaling methods. It has been shown that the information on the salt content of evaluated flavor versions of products, affected the changes in women preferences minimally, whereas among men it resulted in leaning towards the product with standard salt content. In the men group it was observed that the desirability of salty taste, expressed with the degrees of taste desirability, changed significantly to the detriment of the product provided with information about the reduction of the salt content. Nearly 90% of respondents declared that their attention was drawn to the information placed on the package about the reduction of the salt content in sausages. In the group of respondents declaring selection of products with reduced salt content, information about the lower content of this component next to the information about the reduced fat content were the most frequently specified factors in the hierarchy of their choices.

Keywords: nutrition information, consumer, preference, taste, salt

INTERDISCIPLINARY STUDY OF COLOURED COTTON FIBRES FOR FORENSIC PURPOSES

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An assessment of the applicability of two nondestructive techniques – Raman spectroscopy and microspectrophotometry in visible light (Vis MSP), in the examination on a microscopic level of cotton fabrics dyed with mixtures of reactive dyes, is presented in this paper. Fragments of single cotton fibres stained for red, orange, green, blue and brown colour with single reactive dye, and binary or ternary mixtures of reactive dyes, as well as the same type of dyes in powdered form were subjected to the study. MSP techniques were chosen for experiments with cotton fabrics dyed with single reactive dye while Raman spectroscopy were used in examination of fibres coloured with binary and ternary mixtures of dyes and in examination of dyes in powdered form. Three types of excitation sources – 514 nm, 633 nm, and 785 nm – were used during Raman tests, while the MSP study was conducted in the 380 nm to 800 nm range. On the basis of the obtained results, it was noticed that when the concentration of dye rose, the colour of the cotton fibres dyed with blue dye, according to the CIE L*a*b* system, appeared much greener and bluer. For orange fibres – they appeared yellower and redder whilst for red fibres the colour moved to red and to blue. MSP studies also lead to the conclusion that there was no correlation between colour uniformity in cotton fabric (changes in lightness, red/green and yellow/blue colour) and concentration of the reactive dye. The obtained results indicate that Raman spectroscopy doesn't enables identification of all components in dye mixtures used for the cotton dying process.

Keywords: cotton fibre, CIE L*a*b*, reactive dye, microspectrophotometry, Raman spectroscopy

THE EFFECTS OF EMPLOYEES' SATISFACTION GROWTH ON TOURISTS

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Given the present economic conditions, in which the competition between companies that offer touristic services, is stronger and stronger, the companies should focus their resources on their employees and on satisfying their needs. Happy employees will be committed to their jobs and will attract more customers. Besides that, if they achieve what they want, the staff's fluctuation and the costs will be lower. The employees's satisfaction represents a series of positive and negative feelings, experimented by the employees towards their jobs. Work satisfaction is often associated with employee's social prestige and the success at work place. It is corelated with the productivity and the employee's feeling of well-being. Work satisfaction means that the employee is doing a work that pleases him/her, he/she is doing it well and he/she is paid for it. The employees's satisfaction is corelated with their efficiency and efficacy, and that is reflected in the work processes. The main factors that influence the satisfaction are: the managers's concern about their employees, the job's projection, the paying system, work conditions, social relationships, long term's perspectives, the outside opportunities's perspectives, the levels of aspiring and the needs of accomplishment. Concerning the scientific methods used for measuring employees's satisfaction, the most common are: the ISDO survey – Standarized Instrument for Diagnose the Organizations and the SEDA scheme – the Evaluation Scheme of Absolute Data about work satisfaction. In the present project we are going to estimate the general level of employees' satisfaction in a company that offers touristic services and we are going to suggest methods of raising the level of satisfaction, with the purpose of gaining new customers. Customers's satisfaction depends on employees's satisfaction. We can say that a company which is interested in keeping its employees happy will gain more customers and it will keep the old ones.

Keywords: employees' satisfaction, motivation, quality in services, tourism services

FACTORS DETERMINING THE QUALITY LOSS OF APPLES IN INTERNATIONAL TRANSPORT

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This study addresses the issue of the applicability of alternative solutions in road transport. The empirical part of the study aimed at comparing the costs and losses in road transport depending on different means of transport. The costs of transport in tarpaulin-covered lorries/trolleys and in specialized lorries with temperature-controlled cold rooms were compared. The effectiveness of different means of transport was measured based on the level of food product losses in transport. The aim of this study is to analyse the real data and find solutions that might facilitate the decisions in terms of logistics. The study is mostly explorative and focuses on evaluating the effectiveness of currently used food product transport methods. The main goal of this research is to analyse the level of unsold products and their cost due to wrong decisions in terms of the use of transport methods. Such mistakes do not only affect the company finance (the cost of returned or re-called products) but also the company's image. The study was conducted in October-November 2011. The documents of the Forwarding and Transport Company "Trans" were monitored and analysed with the focus on data – the company documentation was not allowed to be presented. The analysis of the results in terms of the losses and costs has revealed the importance of a proper choice of the means of transport. A common trend of transporting fruits in tarpaulin-covered lorries/trolleys proved to be economically groundless. It has also been observed that the transport in tarpaulin-covered vehicles has adverse effect on the quality of apples due to the way of loading and unloading the goods. The analysis showed which means of transport should be chosen, despite the fact that transport in temperature controlled environment is seemingly much more expensive. A considerably low level of product losses in this type of transport makes it generally much more cost-effective. Moreover, the minimum loss of the quality of fruit strongly affects the image of both the forwarding companies and those commissioning the transport.

Keywords: apples quality, apples transport, fruits quality, fruits transport

ATP BIOLUMINESCENCE METHOD IN SURFACE HYGIENE MONITORING

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Bioluminescence method is based on adenosine triphosphate (ATP) measurements, which is the principal energy carrier for all living organisms, including the microorganisms. ATP reacts with luciferin in presence of catalyst - luciferase enzyme, and the effect of this oxidation reaction is emission of light, recorded by luminometer. In the hygiene monitoring, it is assumed that the amount of the microbial biomass is directly proportional to the amount of ATP in the sample. Detection of microbial contamination with bioluminescence technique is often apply for clinical and environmental studies. Bioluminescence method of ATP investigation on solid surface has become well established in food processing industry especially as part of general hazard analysis and critical control points (HACCP) measurements. This is a crucial alternative in comparison with the time-consuming and labour-intensive traditional microbiological tests. This method provides an actual estimation of total surface cleanliness, this includes the presence of organic debris and microbial contamination. Limitation of described technique is lack of possibility for direct recounting the luminometric results to the number of microorganisms, so it is necessary to establish acceptable limits before application of ATP test. This test is commonly used to test if cleaning requirements are achieved satisfactorily. In environmental studies, ATP testing method is developed and implemented for an assessment of the occurrence of biofilm on the plumbing materials that have contact with drinking water or for evaluation of the vitality and adhesion of bacteria on the surface of bioactive polymers. This method was also evaluated as an objective technique that allows to assess the efficiency of cleaning in healthcare institutions and as a rapid method that detects the presence of pathogens responsible for healthcare associated infections (HAIs). Many of these studies indicate that intracellular ATP levels differ between microbial taxa so much that the ATP test should not be interpreted as indicator for a presence of microbial pathogens.

Keywords: hygiene control, microorganisms, bioluminescence method, ATP assay

A COMPARISON BETWEEN INSTRUMENTAL TEST RESULTS AND SENSORY ANALYSIS OF SELECTED PROPERTIES FACILITATING GLOBAL EVALUATION OF COSMETIC EMULSION STABILITY

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The European Union Cosmetics Directive and the regulations of the Minister of Health in Poland thoroughly describe all requirements and methods of testing the composition of cosmetic products. However, there are no standardized methods of testing other properties of cosmetics. Mandatory requirements that have to be met are in case of moisturizing cosmetic emulsions focused on ensuring the safety of their use, but do not stipulate the quality levels of the product, which is particularly important for the customers, who generally look for not only safe in use, but also high quality products. The goal of this text is to check, if the use of sensory analysis allows to specify the properties with the highest dynamics of changes occurring during storage and how the results of sensory analysis of cosmetic emulsion consistency corresponds with the instrumental tests results. Due to the first of hypothesis described above a consumer sensory evaluation was performed by 518 assessors. Their task was to determine the preferences by using the paired comparison test and to point out which of the properties (scent, color, consistency) influenced their choice of fresh or aged sample. Second stage of the sensory evaluation was performed by 38 trained and evaluated assessors who evaluated color, scent and consistency in nine-point hedonic scale, and the viscosity using a linear scale. The last stage of experiment was instrumental test of dynamic viscosity and comparison of obtained results with results of sensory evaluation.

Keywords: cosmetic emulsion, viscosity, sensory evaluation

POTENTIOMETRIC TASTE SENSOR APPLICATION FOR LIQUID PRODUCT TASTE ESTIMATION

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A multichannel potentiometric taste sensors composed of several electrodes with lipid, lipid like/polymer membranes have been used for quality control or discrimination of liquid foodstuff. Two types of electrodes have been used in potentiometric taste sensors: ion selective electrodes (ISE) and all solid state electrodes (ASSE). The electrodes of the first type contain an inner solution of KCl of appropriate concentration. The membrane attached to the electrode's body is composed of polyvinyl chloride, lipophilic compound and plasticizer. ASSEs consist of two layers which cover glassy carbon disc: internal layer attached to glassy carbon is an electroactive polymer. This layer plays the same role as an inner solution in ISEs. The outer layer of ASSEs is the same as in case of ISEs. Multichannel taste sensors provide multidimensional output. This output shows similar pattern for substances of similar taste and different pattern for substance of various taste. Principal Component Analysis (PCA) has been done for data reduction. This multivariate data analysis is a transformation converting possibly correlated electrodes' responses into linearly uncorrelated variables describing the taste characteristics of studied products which enable their discrimination. The multidimensional sensors' outputs may also be presented as radar plots (electrodes' responses vs substances concentration). Comparison of this plots with standardized pattern databases enables identification of unknown samples as well as detection of adulteration. The principle of operation of various multichannel potentiometric sensors composed of several ISEs or ASS electrodes containing lipophilic compounds in the polymeric membrane has been described. Application of such sensors for discrimination or quality control of various liquid commercial products, e.g. beer, wine, coffee, mineral water, milk has been presented. The advantages and disadvantages of using such potentiometric sensors for larger scale have been discussed.

Keywords: potentiometric taste sensor, ISE, ASSE, polymeric membranes

PERCEPTION OF PORK QUALITY BY STUDENTS

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The aim of the research was to define consumers' satisfaction regarding pork in sale, to define factors determining purchase and consumption of pork and respondents' perceptions of the role of food safety management systems and quality's marking and their concerns about food safety hazards that may be present in products made of pork. The instrument used was the author's research questionnaire containing single-and multiple-choice questions . The study was conducted in the first half of 2013 among the group of 165 students of Polish universities. The group consisted of 86% women and 14% men. The results were coded in the Statistica 10 program. In order to determine the relationship between variables and characteristics of the study group compliance χ^2 test was used at a significance level $\alpha = 0.05$. The main factors influencing the frequency of consumption of pork were the possibility to prepare it in many different ways and its taste. While shopping, the respondents pay the most attention to the economic aspects and the expiry date. As it comes to the organoleptic characteristics, students often pay more attention to the color of pork product than for its texture. Although the marking quality is not an important factor determining the purchase of pork, the majority of respondents believe that their presence on the packaging ensures higher products' quality. At the same time, about one third of respondents stated that such markings are not associated with higher quality of meat. Students are most afraid of hazards of meat products caused by the improper expiry dates placed on the products and results of misstatements. Among the microbiological hazards, respondents stated their concerns about *E. coli* and *Salmonella* more often than in relation to *L. monocytogenes*. In statistical terms, the most differentiating feature of the study group of respondents were field of study and place of residence

Keywords: quality of pork, consumer perception

EFFECT OF DEHYDRATED POTATO POWDER ADDITION ON SELECTED QUALITY CHARACTERISTICS OF MODEL MEAT PRODUCTS

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The aim of this study was to analyze selected quality characteristics of model meat products manufactured with the addition of dehydrated potato powder. Stuffings of model meat products consisted of pork, back fat, water and additives such as curing salt and sodium isoascorbate. Functional additives used in production process were three dehydrated potato powders obtained from coloured potatoes varieties: Blue Congo, Herbie 26 and Rose Marie. Potato powders were added in amount of 0,5 and 1 g and control samples were produced without functional additives. Experimental stuffings were heat treated in water bath and stored for 2 weeks under cooling conditions ($4\pm 1^{\circ}\text{C}$). Quality of model meat products was evaluated by analysis of: chemical composition, physical parameters of colour, sensory properties and texture profile. Also thermal drip and yield of production process were estimated. The effect of dehydrated potato powders on lipid oxidation during storage of final products was determined by TBARS method. Studies shown that addition of potato preparations to the model meat products influenced on increasing yield of the production process and on reducing mass losses caused by heat treatment. Moreover, the addition of potato powders caused significant differences ($\alpha \leq 0.05$) in most of the measured texture parameters. Hardness of experimental samples was enhanced by addition of the highest amount of powder from potato variety Herbie 26 compared with control samples. The values of cohesiveness and springiness of experimental samples were lower than those obtained for control variant. All investigated variants directly after production process differ significantly ($\alpha \leq 0.05$) within L^* (lightness), a^* (redness) values. Higher content of substances reacting with thiobarbituric acid was observed in meat products produced with potato powder. However, the oxidative process of lipids run less dynamically in these samples during storage. Sensory assessment showed that along with growing content of dehydrated potato powder in recipe to increase the degree of product acceptance by panellists.

Keywords: dehydrated potato powder, meat products, functional additives

THE USE OF BLIND TESTS IN SENSORY EVALUATION OF COSMETIC PRODUCTS ON THE EXAMPLE OF EYE CREAMS

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The aim of this study was to show the use of blind tests in sensory evaluation of cosmetic products. Based on the results of conducted tests, the product's brand and price were also examined in relation to their sensory properties. The study aimed to verify what the real effects of the eye creams are. In order to eliminate confounding variables such as the brand image or the price, the blind test was introduced. The study was conducted in two stages. The first phase consisted of a survey whose main aim was to find out the general opinion of respondents regarding eye creams and the knowledge of products and brands available on the market. The next phase consisted of sensory evaluation which was conducted in home conditions ("Home Use tests" H-U). Four test groups were created. Each group consisted of 15. The eye creams were put into 25 ml containers and divided into 4 sets. Each set consisted of two different creams. In each pair the main and immediately observed properties were tested first. They were: scent, consistency, homogeneity, application, absorption, hydration and moisturizing properties. Then the properties observed in the long-run were tested: smoothing of the under eye skin area, dark circles reduction, improvement of skin appearance, skin firmness. The evaluation of such properties is only possible after a considerably long period of use. To determine statistically significant difference in preference among each pair of creams, the two-tailed test was used. The null hypothesis stated that there was no significant difference between the creams in each pair, the alternative hypothesis – on the contrary – that there was a difference between two creams. The eye creams were applied twice a day (in the morning and evening) for a period of two weeks, with each cream used on one side of face only. The results of blind tests in sensory evaluation have proved that branded products are not necessarily better in terms of their quality and sensory properties. There is no linear relationship between the high price and high quality; more expensive products did not receive better scores than the cheaper ones.

Keywords: sensory analysis, blind tests, cosmetic, quality

INVESTIGATION OF ACIDIC SOLUTIONS USING ASSE POTENTIOMETRIC TASTE SENSOR

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Potentiometric taste sensors with electrodes containing lipid, lipid like / polymer membranes was already used to distinguish commercial liquid products. In this paper a new potentiometric taste sensor consisting of six All Solid State Electrodes (ASSE) has been presented. Each of membrane contains a selected lipophilic compound. The set-up consists of six ASSE and a reference electrode (Ag/AgCl/Cl⁻) filled with 3M KCl solution. The inner layer of a conducting polymer PEDOT/PSS was put on carbon disc. The outer layer was a polyvinyl chloride membrane containing appropriate lipophilic compound, and plasticizer. Lipid, lipid like compounds used in this sensor were the following: hexadecyltrimethylammonium bromide, hexadecyl amine, palmitic acid, lauric acid, decanoic acid and cholesterol. The responses of ASSE to acid solutions in the concentration range of 10⁻⁵-10⁻²M have been presented. The following acidic substances were examined: hydrochloric acid, malic, tartaric, succinic, lactic, acetic. The sensitivity of potentiometric taste sensor has also been studied. The results presented in the form of radar plots (electrodes' responses vs substances concentration) showed a different patterns. The electrodes with the membranes containing positively charged compounds were much less sensitive to the changes of acid concentration in comparison to the electrodes with the other lipophilic compounds used. Taste sensor stability was also examined. It was found that the sensor is in general stable within the experimental error to acid concentration during seven days. Preliminary studies reveal that such potentiometric sensor with ASS electrodes and proposed lipid, lipid like compounds in the membrane may be used for quality control of red wines.

Keywords: electrochemical taste sensor, acids, ASSE, potentiometric sensor, polymeric membranes

THE MODEL OF ORGANIZATION FOR SUSTAINABILITY IN THE SOCIAL REPORT OF UNIVERSITIES

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The Social Report is emerging as a tool for information and communication that many types of organizations use to communicate their commitment to third parties about social and environmental sustainability. In particular, institutions such as Universities, which provide services to the community, have to report in a constant manner to the stakeholders, as regards the quality of services provided - quality marked by a continuous improvement - and the characters that define the offer - always more extensive and innovative. The word "sustainability" is the term we're going to combine with Report of Universities, in order to see if this sensitive data has already been implemented by the Athenaeums as drive of the institution and, if taken into account, examine the modalities of the implementation in the university institutions. In the present paper, after analyzing the flow of the relationship between the University and the area, would be reviewed the Report of Italian and foreign Universities, who have studied the fallout that the organization has, not only on the quality of services, but also about the environmental impact on the Ecosystem, the use of renewable energy, the attention about energy saving. The American universities have even a document in relation to sustainability demonstrated in the conduct of their business, the "Sustainability Report Card". In this document an external body evaluates, more or less virtuous behavior of the organization, which is assigned a score. The traditional meters of the social, economic, environmental sustainability used by Universities are contained in the GRI Guidelines version 3.1 (Global Report Initiative), but there are other useful parameters to make a more comprehensive model, such as the ISO 9000 on quality, ISO 14000 about environment and the recent ISO 26000 on the responsibility of organizations.

Keywords: sustainability, university, environmental, social report

ENVIRONMENTAL ATTITUDES AND ACTUAL BEHAVIOR OF BULGARIAN CITIZENS

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In recent years, environmental issues are becoming a serious concern for citizens. Most surveys show that the vast majority of Europeans are aware of the environmental issues and realize their importance for the quality of life and socio-economic system as a whole. At the same time individual environmentally friendly behaviour is not widespread. This study investigates Bulgarian citizens' opinions on whether environmental protection is a personal responsibility of each individual or a political task, thus highlighting discrepancies between what individuals say and what they really do. The survey was conducted during the months of April - May 2013 and it involved 1011 adults, citizens of the Republic of Bulgaria. The study shows a high level of support from respondents for measures and actions aimed at environmental protection in Bulgaria. Despite a high degree of environmental consciousness, behaviour seems to follow the traditional line of action, and everyday experience points to obvious inconsistencies between verbal claim and actual behaviour. It was established that highly approved environmental models of individual behaviour rarely motivate and direct the daily activities of Bulgarian consumers.

Keywords: environmental attitudes, self-reported environmental behavior, Bulgaria

QUALITY MANAGEMENT IN BUSINESS ECOSYSTEMS: CHALLENGES AND OPPORTUNITIES

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This paper aims to investigate the future of quality management during the paradigm shift from mechanistic to ecosystem way of thinking. The main goal of the paper is to provide a framework for implementation of quality management principles and practices in business ecosystems. The research is based on the concept of Marketing Development Index (MDI) methodology which is a vibrant metric system aimed at identification and supporting the dynamic and sustainable growth and development of organisations and institutions in time of turbulent changes. The conceptual model is developed based on the literature review on quality management approaches, incl. TQM and their internal and external drivers for change as well as the theory of business ecosystems. It captures the emerging debates around the future of quality management systems and standards. Research questions driving this paper are: (1) which are the CSFs and KPIs of the intra/entra-communications flows of a business ecosystem, (2) which are the gaps in QMS implementation and (3) how to adapt quality management to fit to the needs of business ecosystems. Firstly, a benchmarking analysis of quality management activities of a sample of companies in North East Planning Region is conducted. Secondly, CSFs and KPIs of the intra/entra-communications flows of a business ecosystems are identified. Thirdly, a framework for implementation of quality management principles and practices in business ecosystems is provided. Presented methodology captures the emerging debates around the future of quality management systems and standards. The author present the possibilities of Marketing Development Index (MDI) methodology for quality management implementation in business ecosystems.

Keywords: quality management, business ecosystem, MDI

DEMYSTIFYING THE ORGANIC PRODUCT: FROM POSITIVE IMAGE TO DECEPTIVE REALITY

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The positive image of organic products among consumers has grown gradually. Today, this image is based on a number of researches and studies conducted by specialized government bodies and private organizations and research institutes that show that these products offer, in terms of their nutritional profile, a high intake of vitamins, minerals, antioxidants, essential fatty acids and sometimes protein. Consumers also know that operators who produce and sell such products are subject to rigorous regulations for obtaining the organic certificate and the right to use the organic logo and are regularly monitored by inspection and certification bodies in this regard – facts that increase the consumer's confidence in the quality and safety of these products. The purpose of the research is to identify potential problems in the nutritional profile of organic products sold in Romania, whose consumption may be inadequate for the diet and health of consumers, especially for those who have certain dietary restrictions due to nutritional disorders. We propose, therefore, to scientifically investigate (using a method that is recognized and standardized in the European Union), both quantitatively and in terms of quality, the nutritional factors available in organic products that have to be restricted or even eliminated from the daily diet of certain consumers.

Keywords: demystification, organic product, labelling, nutritional profile, consumer protection

BIOFUEL – NO SUCCESS STORY? AN INVESTIGATION IN THE STATE IN AUSTRIAN

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Austria has already a long and sound tradition on research and development activities in the field of biofuel and a well-known production and investment industry. Much ambition on research was put to the topic after the oil crisis in 1973 and later in 1978 in order to become energy independent. One of the ideas behind was to “feed” machines, which had replaced animals. However, what we usually forget today, is that at that time we faced surplus production, which had to be subsidized on the markets and the problem was to save these costs. This seemed reasonable but on stressing sustainable development, the idea became a different dynamic: biomass was considered as perpetuum mobile of energy production and EU policy put much emphasis on this development. Under the pressure of climate change discussions, the Directive 2003/30/EC (Biofuels Directive) was released, setting indicative targets for the use of renewable fuels in the transport sector. For Austria this was 5,75% substitution of biofuel to fossil fuel. Next important step was the Renewables Directive 2009/28/EC on the promotion of the use of energy from renewable sources. Applying the pressure state response model this means that under CO₂ release by human activities the state of the climate -according to many scenarios- seems to be worrying– what produced a response by polices. Unfortunately the response did not really produce the expected effect to relief the environment from burdens. The idea turned out to be more and more destructive for natural and social systems and again policy responded, this time by the introduction of sustainable certification schemes. For Austria, the biofuel development shows that after a period of successful startups mainly about 2005 the biofuel production scenery declined, changing form many private firms to some unsure enterprises gradually taken over by big players in the field. Only a few national firms could survive in niches like, for instance, using feedstock of used oils for production plants. This transition from a small but boosting national scenery, which became integrated in the international race for biomass was traced for this contribution by exploring firm histories, Further the practice of sustainability schemes, applied for biofuel production in Austria will be considered. The story of biofuel is a good example to demonstrate the present anthropocentric view about the earth supposed to function as a mere source for human resources without considering interactions. As well, it shows how difficult it seems for the economic systems to stay moderate in exploiting nature.

Keywords: biofuel, biodiesel, renewable energy

PLANNED OBSOLESCENCE BY VIEWS OF CONSUMERS AND OTHER STAKEHOLDERS

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By planned obsolescence we understand that a product is constructed with shorter physical life than is technological feasible under considering cost conditions or that consumers under a social pressure replace products with still substantial physical usefulness. Although this phenomenon is not easy to separate from innovation and is hard to detect and prove, many people feel upset about it and a part of them is aware of the purpose behind it: to make them buy more often things. Apart from few famous historical lawsuits like the Phoebus Cartel, it is hard to sue this behavior of industry. Thus, it remains to consumers' stakeholders, to environmentalists and private initiatives to raise the awareness for this problem. Policy is reacting slowly and the EU Commission started to counteract mainly within its Ecodesign policy. As planned obsolescence is scientifically hard to measure by science-based values interviews are a good method to bring some enlightenment on the existence of planned obsolescence. For this contribution, guided interviews with Austrian stakeholders were made (economy, consumer side, and service institutions). Social media were used for a further small investigation. These results will be demonstrated. In order to get a broader imagination of the view of the public on the one hand and to create awareness on the other hand the author engaged some 15 students in a seminar to act as multipliers. First the students themselves were briefed on the topic and then they were handed over a questionnaire with series of qualitative or open questions on knowledge, attitude, experience and suggested measures for making at least five guided interviews within their families, friends, etc. The evaluation of these questionnaires will be described in the contribution and, although not really representative, as most questioned were parents and friends (2 generations), results largely comply with those of other, bigger investigations in study literature. The most interesting issue however was the student's reaction: they were eager to report on their discussions with the interviewed persons. They enjoyed their role to explain and discuss and to raise awareness. In such way it is possible to contribute to consumer information and education in a small but very effective way.

Keywords: ecodesign, consumer, product life time

E- MOBILITY – A CHANCE FOR THE FUTURE

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Mobility today is one of the largest sources of CO₂ emissions into the atmosphere, thus contributing to GHG induced climate changes. In Austria this contribution is around 27%. Although fossil fuel based transport systems have since longtime been studied to raise their efficiency, the CO₂ burden by transport systems has not decreased, as rebound effects favored long-distance transport of more and more goods and passengers especially by road transport. But not only climate impacts are significant, also health effects caused by poisonous exhaust emissions, dust particles to nano- size and noise and vibration reach dimensions far exceeding the death victims caused by traffic accidents. Thousands premature deaths mainly from lung cancer and heart attacks are accounted to traffic emissions. E- Mobility is now penetrating into the car market, advanced by gradual technical improvement, although technology has been available since longtime. No noise, lower emissions depending largely on the electric power source and not concentrated in the big cities, are only a few advantages. Thus e- mobility could contribute much to mitigate above problems. The author has long term practical experience in using e- mobility in daily life and has studied the technical development since decades. Founded on this basis advantages but also barriers of the implementation of e- mobility will be presented in the poster.

Keywords: sustainable transport, automobile, traffic, environmental pollution

CORRELATIONS BETWEEN PERFORMANCE PROPERTIES OF TEXTILES AND CONCENTRATION OF FABRIC SOFTENER IN RINSING BATH

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Fabric softeners are a type of household products. They are added to the final stage of washing, i.e. rinsing. Their aim is to give the laundered fabrics a nice scent and make them softer, prevent static cling and facilitate ironing. The main ingredients of fabric softeners are cationic surface active agents. The most commonly used are those containing a branched hydrophobic part. This type of structure ensures low solubility in water and, in consequence, the ability to migrate to phase interfaces. The present study examines consequences of the consumers' tendency to add excessive amounts of fabric softener to the final rinsing bath. To this aim, rinsing baths were prepared with compositions reflecting systems containing both excessive and deficient amounts of a fabric softener. The rinsing baths used in tests had the following concentrations of the active ingredient (expressed as pure substance): 0.0001%; 0.001%; 0.01%; 0.1% and 1%, respectively. The tests were performed with cotton fabric samples. The softness of different fabrics and their rewettability level were assessed. In order to gain additional information about the properties of different solutions, surface tension measurements were carried out. The optimum range of concentrations of the active substance in the rinsing bath was found to be the range from 0.01 to 0.1%. Such baths increase fabric softness to a desired extent, at the same time ensuring a relatively high level of rewettability. These results were corroborated in surface tension tests: the concentration range specified above was found to induce a sufficient degree of saturation of the interface (fabric fibre surface). The tests also show that using excessive amounts of fabric softeners may cause a highly undesirable decrease in the hygienic properties of fabrics.

Keywords: fabric softeners, quality, household products

INFLUENCE OF EXTREME HEATING ON COLOUR AND ANTIOXIDANT ACTIVITY OF DIFFERENT TYPES OF HONEY

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Numerous factors affect the quality of honey and thus its health properties, including the blending process, storage conditions and thermal treatment. The most discussed topic relating to honey "quality" is heating. Thermal treatment is applied to the honey in order to slow down crystallization and fermentation processes and ensure stability during its commercial life. It may lead to drastic changes in honey's chemical composition and finally, heating to high temperatures may reduce the health benefits of honey. The aim of this study was, therefore, to assess the contribution of two factors, i.e.: botanical origin and heating, to the variability in colour and antioxidant activity in order to verify the thesis that thermal treatment affect these selected quality factors of honey. 82 honey samples harvested in 2009 and 2010 flowering seasons were investigated in order to examine the effect of heating on colour, antioxidant activity and total phenolic content. In fresh honey samples the total phenolics content varied between 40.5 and 177 mg GAE/100g. The average antioxidant activity ranged from 47.2 to 83.4% once measured with DPPH and from 6 to 79% when measured with ABTS⁺, depending on honey type. The results indicated that heating led to significant variations in levels of these quality parameters. Generally it could be said that the antioxidant activity in honey samples heated in 50 and 60°C was lower in comparison with raw honeys while in honeys heated in 70 and 80°C it was much higher. Total phenolics content increased gradually as affected by heating, the more heat, the greater values of that parameter.

Keywords: honey, heating, antioxidant activity, colour parameters

THREATS TO CONSUMERS IN THE CONTEXT OF QUALITY OF MEASURING INSTRUMENTS

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Integration processes in Europe as well as creation of a unified market increase interest in a consumer and their protection. Common market means benefits for customers i.e. access to a wider choice of goods and services on one hand, but on the other hand, increased risk of unreliable information about a product or placing into market nonconforming goods. According to European law the producer is responsible for the measuring devices he introduces on market and the country authorities are responsible for activities aiming at minimizing threats connected with using non-conformable goods. Conformity assessment on the market is a kind of market control, a set of activities and means adopted by a country to ensure that goods comply with the law requirements named in harmonization standards or are no threat to health, safety and public interest. State organs control the goods which are placed on the market, identify non-conformable goods, arrange their withdrawal from circulation or limit accessibility on the market. System of market control, on one hand, protects consumers and users against threats connected with the use of non-complying goods, on the other hand, protects producers by creating equal conditions for market activity. System of market control in reference to requirements for measuring instruments refers back to Non-Automatic Weighing Instruments (NAWI) Directive and other Measuring Instruments Directive (MID). The State control system does not absolve the users of measuring devices from liability for correctness of measurements. Control is, therefore, needed over devices being in use. It is vital that the users have knowledge about measuring instruments and are aware of the necessity of metrological control over devices not only because of the legal requirements, but above all, to take care of the quality of goods, services and public interest in general. In the article we analyzed issues connected with consumer threats in the context of measurements correctness performed by the users.

Keywords: measurements, consumer protection, conformity assessment, producer, user, quality

SENSORY DRIVERS OF CONSUMER ACCEPTANCE OF APPLE JUICES

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One of the fastest growing trends in juice market is obtaining products minimally processed, characterized by sensory properties similar to raw material. Technological process significantly affects the quality of juice, both sensory characteristic and chemical composition. A better understanding of consumers' sensory perception ensures that attributes relevant for consumers are exploited in food product development. The aim of the study was to identify sensory properties of apple juices that determine consumer acceptance. Eight samples of apple juices commercially available on the Polish market were selected for analysis. Four of them were from concentrate (clear and cloudy) and the others were not from concentrate (natural cloudy pressed and freshly squeezed juices) from conventional and organic production. The sensory profiles of eight apple juices were evaluated by trained panel consisted of five assessors with the use of sensory descriptive analysis methodology. Twelve sensory descriptors were identified and assessed using 10-cm unstructured intensity scale. A total of ninety six consumers of apple juices participated in the sensory study. Consumers evaluated the samples of apple juices under blind conditions in 9-point hedonic scale (1 = dislike extremely, 5 = neither like nor dislike, and 9 = like extremely). Consumers reacted differently to the sensory characteristics of the juices; overall liking scores ranged from 4.1 to 6.2. Freshly squeezed juices NFC and cloudy juices FC were the most liked products. Similar sensory profiles of the juices in four categories were obtained by sensory panel. Sensory and consumer data were subjected to statistical analysis. Pearson coefficients were calculated to evaluate correlation between the parameters studied and identify drivers of consumer liking. The results of correlation analysis showed that the consumer acceptance was negatively correlated with sour flavour (-0.822). Significant correlation coefficients between sediment and bitter taste (0.784) and between the clarity and apple aroma (-0.823) were determined.

Keywords: apple juices, sensory properties, consumer acceptance

AN APPLICATION OF INTEGRATED PRODUCT POLICY IN ENTERPRISES

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Along with increasing globalization of economic processes the necessity of seeking areas that can become a source of changes promoting increased competitive position of enterprises interacting with the natural and social environments. Since environmental problems became a global concern, the improvement of relations between the enterprise and environment is one of challenges facing contemporary economy. An increasing demand for products led to the development of industrial manufacturing methods. Contemporary society more often places environmental protection among increasingly important topics. There is increasing awareness of the need of pro-ecological activities both in macro- and micro-environmental scales. This trend forced enterprises to use strategies that realize the fundamental ideas of sustainable development. A way of pro-ecological orientation of enterprises is inter alia compliance with the Integrated Product Policy recommendations. This paper presents both theoretical and empirical approaches. The first part contains a theoretical view on Integrated Product Policy objectives and selected tools that enables effective enterprise management, while considering environmental care. Among tools special attention is paid to environmental management systems, product life cycle analysis and environmental labeling. The second part presents the results of performed researches on the implementation of mentioned tools in enterprises. The study is justified by the necessity of permanent and effective including ecological prerequisites into enterprise's policy. This results among other things from ecological policy adopted by the state as well Integrated Product Policy promoted by the European Union.

Keywords: Integrated Product Policy, environmental management systems, environmental labeling, product life cycle analysis

ON POSSIBLE APPLICATION OF THE PRODUCT LIFE CYCLE ANALYSIS (LCA) IN ENVIRONMENTAL LABELING

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An increasing amount of manufactured products and increasing environmental hazard dictate the use of the tools designed to reduce its detrimental effect. The effective and reliable notification of product parameters, in particular its environmental features that decides on its competitive edge over other products available on the market is an important question. For this purpose environmental labeling, that should be simple and legible but also reliable and true is used. Information given of products can be confirmed by more and more widely used in industrial practices environmental impact assessment taking into account the entire product life cycle (LCA). Also ecological product features should apply to any stage of product life cycle, i.e. from acquisition, raw material extraction through manufacture, distribution and transportation, use and utilization to disposal of used products. The aim of this paper is to present possibilities of using product life cycle assessment in environmental labeling. This subject is justified by continuous development of manufactured products as well as manufacturing processes, that imposes the use of complex methods for environmental impact assessment based on a consistent methodology, especially in the context of deteriorating environmental quality. Environmental labeling is considered as an important instrument of environmental management. It is emphasized that both the nature and potential of product environmental impact should be established in an objective and repeatable way, as provided by the use of LCA procedures. Thus, the product life cycle analysis should be commonly used in eco mark certification procedures, not only in some selected cases.

Keywords: product life cycle analysis, environmental labeling, environmental management

RFID TECHNOLOGY IN SUPPLY CHAIN OPERATIONS

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Presented paper concentrate on using RFID (Radio Frequency Identification) technology in supply chain management. Supply chain management is the management of material, information and finance through a network of organizations (i.e. suppliers, manufacturers, logistic providers, wholesales distributors and retailers) that aims to produce and deliver products or services for the consumers. It includes the coordination and collaboration of processes and activities across different functions such as marketing, sales, production, product design, procurement, logistics, finance, and information technology within the network of organizations. The desire to cut supply chain costs has pushed radio frequency identification. Technology, an e-tagging technology that can be used to provide electronic identity to any object. RFID is not a new technology. It was first used in the Second World War to identify aircraft. But the application of this technology (described in the paper) in supply chain management is new. For a nominal price a RIFD tag is attached to the product in the initial stages of manufacturing that follows the product down the supply chain all the way to a retail setting, and finally into the hands of the customer. There, it can again be scanned while in a box or crate, saving labor. In a retail setting, the tag can serve as the price tag count on the tag for warranty information after purchase. Consumers can RFID does not require the tag or label to be seen to read its stored data. RFID uses radio waves to capture data from tags, rather than optically scanning the barcodes on a label. RFID systems have three primary components: the tag or transponder, the reader, the computer. An important promise of RFID technology is to cut costs and deliver a wealth of information that helps firms more effectively understand, predict, and respond to customer demand. RFID not always is the best solution. It is an enabler that allows firms to change their supply chain processes for the better. RFID technology is used in a range of applications. More specifically, it has useful applications in the following industries: shipping and distribution, retail industry, manufacturing sector, agriculture, cattle and food production, health care, pharmaceutical, government, gaming industry, security industry.

Keywords: RFID, supply chain management, RFID benefits, RFID risks

MARKET ANALYSIS OF POLYETHYLENE PACKAGING IN UKRAINE AND NEW REQUIREMENTS FOR QUALITY CONTROL OF POLYMERIC PACKAGING MATERIALS

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The growth of the global market of packaging materials, changing in directions of its development, increasing requirements in terms of safety protection products and packaging materials, which connected with environment, have found unprepared of Ukrainian enterprises to the introduction of new technological schemes. Flexible packaging materials market in Ukraine range to 209 million dollars in 2011 and expected his increasing on 4.9%, which is approximately 266 million dollars in 2016 year. The main materials for the produce of flexible polymer packaging are polyolefin's, their copolymers and derivatives, which are inexpensive and have good enough consumable characteristics. Foremost, there are polyethylene, polypropylene, polystyrene, polyvinyl chloride and polyethylenetereftalate - materials whose production in Ukraine are limited, that why polymer market is characterized by significant dependence on imports. Diversity of providers, which have different sources of raw materials not exactly suitable to technological features of manufacturing of polymer products for high-quality packaging materials and led to the hardening requirements of both the input control, also as to the introduction of new research on quality, reliability and determination of exploitation time. At the same time, consumers are demanding new types of flexible packaging (mainly polyethylene), which would differ not only by lower cost and higher mechanical properties, but also had a set of such properties that are required for the storage and transportation of certain products and problem for recycling of packaging materials after exploitation were absence. Quality of products from polymeric materials for packaging is usually evaluated by checking the appearance, construction, identifying visible defects, and by exercised chemicals, hygiene, physical and mechanical testing, quantity of which are determined by the direction and application of packaging materials. These tests cannot fully predict the long period changes in characteristics of protective coating material. It showed the need for accelerated investigations in artificial weather chamber, regular researches of structure and surface morphology with noting changes in protective coatings in all phases of life cycle

Keywords: market of polymeric materials, packaging, quality

THE STUDY ON THE GLOBALIZATION STRATEGY OF JAPANESE SAKE - FOCUSED ON THE VISEGRÁD GROUP (V4) MARKET

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In Japan, the domestic consumption of SAKE is going to reduce per year, while the SAKE boom was going on in the world. There, Japanese sushi and sake consumption in the global market show a continued increase. The Japanese government is developing global strategy utilized Japanese food and SAKE as part of Cool Japan strategy and resolution of the issue of reduction in personal SAKE consumption. In this study I especially consider the situation of the globalization and overseas market's agenda of SAKE in the VisegrádGroup (V4) as The Czech Republic, Hungary, Poland and Slovakia. On Sep. 4, 2012, Japanese government announced "Program to export Japanese liquor or other" to promote "Globalization of Japanese liquor". This program includes many important policies to encourage export such as establishment of marketing strategy, establishment of brands, strengthening of industrial basis, and local vitalization by creating liquor tourism. While it is important to expand Japanese liquor business in the world market including Eastern Europe with combined efforts of government and civil sector, what is most important is efforts of Japanese liquor manufacturers to develop markets. Success will be unlikely outside Japan in the mindset of pride in "This is popular in Japan". Also, the level of understanding local areas and creation of native mania who understand Japanese liquor are points to strengthen competitiveness of Japanese liquor there.

Keywords: sake, global strategy, Visegrád Group (V4)

EVALUATION ON MONGOLIAN CASHMERE CLOTHING: COMPARISON BETWEEN MONGOLIAN WORKERS AND FOREIGN TOURISTS

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Mongolia is the second largest cashmere producer in the world following China. While cashmere is one of the major export items for the country whose export is heavily dependent on raw minerals and coals, Mongolian cashmere industry is currently skewered in herding and primary wool processing. The main objectives of this study were to examine the evaluation of Mongolian workers and foreign tourists on Mongolian cashmere clothing, and to compare their evaluation. Two separate surveys (Survey I with Mongolian workers and Survey II with foreign tourists) were conducted. In the Survey I during July to Dec. of 2012, 90 questionnaires were collected, and 79 were used in the final analysis. Questionnaires in Survey II were prepared in four languages. 716 questionnaires were collected during July to Sept., 2012, and 616 (149 from Korean, 128 from Japanese, 119 from Russian, and 220 from English-speaking visitors) were used in the analysis. Evaluation by Mongolian workers differed significantly in most items such as brand prestige, luxury, uniqueness, and value between optimists and pessimists. But two groups did not differ significantly in evaluation on color and price. Evaluations by high purchase intention group of tourists were significantly higher than those of low purchase intention group in all aspects. Mongolian workers evaluated more favorably on uniqueness, luxury, design, fashionability, while evaluation by foreign tourists were higher on value and price. The results suggest that favorable evaluation by foreign tourists is centered on price competitiveness, which Mongolian workers seemed to underestimate.

Keywords: Mongolian cashmere clothing, evaluation on cashmere clothing, Mongolian workers, foreign tourist

LEGAL ASPECTS OF FOOD SAFETY IN POLISH LEGAL ORDER IN EXAMPLE OF MILK AND DAIRY PRODUCTS

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Regional products considering more progressing mass production of food arouse curiosity of consumers and gain their sympathy by taking inchangeable place in our every day menu. Despite huge interest on the market their legal status is not precisely determined. Activities tending to these regulations in polish legal order were undertaken fairly not long ago. The impulse to create such legal solutions in this field was the necessity to adjust polish law to European Union's requirements. Regional products identify by their specific features related to a place of origin, feedstocks, tradition of manufacturing, ways, methods and techniques of production. This uniqueness is displayed amongst many others in flavour, aroma, looks and colour. To maintain their specifics and unique features there is a great need of giving them an appropriate status in polish legal order. Taking this under consideration in a context of this essay special attention is emphasized to introduction of requirements which are set to food of special characteristics (like regional products) in the way of its safety. In this article there will be conducted an analysys of selected domestic legal solutions relating to regional product. The review of current regulations will be carried out in examples of regional dairy products and their preserves. There will be an attempt taken up to answer if designed legal regulations in this matter implement in sufficient way standards of food safety. The issues will be verified regarding protection against illegal and deceiving practise, fabrication of regional foods and other practises which can mislead the consumer. The conducted analysys of current legal regulations will help to determine the certain areas which need to be defined more precisely, coherently and thoroughly.

Keywords: regional product, food safety, milk, dairy products

WATER AS A VALUABLE ASSET

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Existence of live organisms on Earth and evolution of human beings is based on variety of important processes and factors amongst which water is one of the most important substances. This life giving liquid should be universally recognized as unusual good which should be a subject of special protection. Also from the Commodity Science point of view the role and meaning of water should be emphasized and never to be marginalized. At this point it should be emphasized that no product could exist without participation of water. Diverse processes: productive, organizational or innovational would not be possible to conclude without its presence. Experts in Commodity Science until now in small way analyzed the meaning of this unusual substance for achieving high quality processes and productivity. Also in a product's cycle of life amongst its many determining factors meaning of water is not exposed enough. In this cycle more important role is given to energy and power consumption, waste management and recycling than to water economy and rational water and sewage management. Promoting energy saving is more visible than promoting water saving. In Poland where for one inhabitant are accrued same amounts of water as in Egypt – we have not learned to respect this amazing substance properly. Physiochemical parameters of water (reaction, density) make it very important quality reference in analytical research. Mentioned information, have been an inspiration for the Author in presenting meaning of water from the Commodity Science point of view. The goal of these analyses will be the evaluation of this substance in approach to products cycle of life in sustainable development. In this article there will be presented availability of freshwater, properties of water, reasons of its pollution, partial water stock management as well as ways of saving and regenerating water stocks. There will be also presented its role as a medium in creating, evaluation and protection of the product.

Keywords: water, quality, property, commodity science