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"e-FACTORY OF SCIENCE"  
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# THE BOOK OF ABSTRACTS

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**„e-Factory of Science”**

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## **POLITICS INCLUDED IN SONG LYRICS OF THE "PIDŹAMA PORNO" ("PORN PYJAMAS") BAND**

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Anna Małoszewska, PhD student at the Department of Journalism at the Faculty of Political Science of Maria Curie Skłodowska University in Lublin. Author of article: Slash. Preliminary analysis of the media image.

### **Abstract:**

Music communicates to hearers its content using appropriate channels. For many years there has been a close connection between the music and political scenes, but not only through songs created or played on the anniversary of national holidays but also by manifest artistic political views. In America The Beatles were the best way to explicit governmental opinions. In Poland, rock music appeared firstly in church rituals. On 14 January 1968 there has been first ever in Poland rock Mass, took place in Podkowa Leśna: The Lord Is My Shepherd with lyrics by Kazimierz Grześkowiak and music by Katarzyna Gertner. The Mass performed Czerwono-Czarni music band. This article focuses exclusively on the political content of Pidżama Porno's band song texts. It's a group formed in 1987 by Krzysztof Grabowski and Andrzej Kozakiewicz. In 1989 they recorded their first material entitled Ulice jak stygmaty. After a few interruptions in its activity, Pidżama Porno is concerting and recording to this day.

### **Keywords:**

policy, government, political views, Krzysztof Grabowski, Pidżama Porno



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## **PERSONAL INTERESTS - SELECTED PROBLEMS**

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### **A few words about the author:**

Krzysztof Świąteczak is a law student at the WSB University in Poznań. He is interested in Polish civil law, Polish history and legal history. He is the author of several scientific articles on legal issues.

### **Abstract:**

Personal interests of individuals and legal entities are protected by Polish law. Regulations related to personal interests of individuals and legal entities are found in the Civil Code.

Unfortunately the Civil Code was enacted 1964. Many regulations cannot be adapted to modern realities. Many prescriptions should be changed. Applies to also personal interests. There are many problems for example what is personal interest. Another problem is the proper application of provisions on the protection of personal interests to legal persons.

The purpose of the paper is to show the most important problems related to the protection of personal interests of individuals and legal entities.

### **Keywords:**

personal interests, problem, natural person, legal entity





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## **PERSONAL INTERESTS OF FOOTBALL CLUBS**

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### **Abstract:**

Personal interests of individuals and legal entities are protected by Polish law. Regulations related to personal interests of individuals and legal entities are found in the Civil Code.

Some football clubs are legal entities. Thus, their personal interests as legal entities are protected by the Civil Code. This is a very important issue, because football clubs, especially the biggest ones, must take care of their good name.

The purpose of this paper is to familiarize conference participants with the issue of protecting the personal interests of football clubs.

### **Keywords:**

personal interests, legal entity, football club



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## **MENTAL REPRESENTATIONS: AN ATTEMPT TO CHARACTERIZE THE INFLUENCE OF TRANSLINGUAL EXPERIENCE**

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Dorota Watkowska is a PhD Student in Linguistics at Nicolaus Copernicus University in Toruń. Her academic interests focus mostly on cognitive linguistics, in particular construction grammar, and English as a Lingua Franca.

### **Abstract:**

One of the most significant discussions in cognitive studies concerns the question of what the nature of mental representation is. Admittedly, researchers have shown a great interest in the analysis of whether mental representations should be conceptualized as either independent from or coupled with human experience from the perspective of both monolingual and multilingual speakers. However, while a dominant approach seems to be focused on the experience-based character of mental representations, much uncertainty still exists about the influence of linguistic experience among people without a common language. Thus, the presentation aims to discuss current approaches to mental representations and indicate in what way the aforementioned type of experience can affect mental representations.

### **Keywords:**

translingual experience, mental representations, modal symbols



## **INCARDINATION AS THE BASIS FOR THE RIGHT OF CLERICS TO A DECENT SUPPORT**

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Catholic priest, PhD in canon law, judge at the diocesan tribunal, lecturer in canon law.

### **Abstract:**

The clergyman has the right to a decent support, the justification of which should be seen in God's natural and positive law, strictly defined and properly sanctioned in Church legislation. An analysis of the legislator's instructions regarding the support of clergy indicates two legal bases for the aforementioned clergy entitlement, which are: incardination relationship and temporary service to a particular Church (cf. can. 271 § 1). "Every cleric must be incardinated either in a particular church or personal prelature, or in an institute of consecrated life or society endowed with this faculty, in such a way that unattached or transient clerics are not allowed at all" (can. 265). By the fact of incardination, the sacramental character and the legal position of the clergy associated with it are assigned to the specific organizational structure of the Church. The act of incardination, which regulates the scope of the relationship between the bishop and the clergyman, evokes specific duties and rights on the incardinated and incardinating side. The incardination relationship that determines the clergy's service implies the right of the clergyman to decent support and the correlative obligation of diocesan bishop to take care of its proper implementation. Therefore, this relationship takes the form of a legal relationship in which the specific right of one entity implies a specific obligation for the other.

### **Keywords:**

incardination, decent support, diocesan bishop, clergyman, the right of clerics



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## **THE SPECIFICITY OF DEATH IN AMERICAN CARTOONS**

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### **A few words about the author:**

PhD student of history dealing with the history of culture of the Iberian Peninsula, Latin America and the United States. In addition, a lover and researcher of pop culture - especially comics and their structure, cartoons and video games.

### **Abstract:**

Death is a phenomenon that accompanies everyone, because sooner or later it will end the "life" of all living things in this world. That is why people over the centuries have tried to portray this phenomenon in various ways by attributing elements of sadness, terror and even fun to it. The twentieth century and the development of popular culture meant that the phenomenon of dying began to be looked at in a completely different way. Death in pop culture became something temporary, because favorite characters returned from the grave to continue to experience extraordinary adventures to the delight of their fans. Nevertheless, death especially in cartoons intended for children in some ways can be an attempt to tame the youngest with this phenomenon. The aim of the paper will be to present how dying and death in a broad sense is seen by American culture creators on examples of animated short films, directed mainly at children of such labels as Disney, Warner Bros. or Hannah Barbera.

### **Keywords:**

death, cartoon, USA, animation



## **INFLAMMATION IN LUNG CANCER - PENTRAXIN 3 AS A NEW PREDICTIVE FACTOR**

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### **A few words about the authors:**

We are interested in medical sciences and we always want to know more.

### **Abstract:**

Lung cancer remains a serious public health problem and is the first cause of cancer death worldwide. The vast majority of deadly lung cancer cases (85%) are non-small-cell lung carcinomas (NSCLCs). Many cancer cases occur at a site of infection, chronic irritation, and inflammation. Inflammation plays one of the key roles in lung carcinogenesis. Tumor microenvironment has been proven to be regulated by inflammatory factors of the tumor: growth factors that promote proliferation, survival factors that limit apoptosis, proangiogenic factors, enzymes that promote angiogenesis, invasion and metastasis. In addition, inflammatory cells can release many cytokines, chemokines and inflammatory mediators, such as reactive oxygen species, which are mutagenic and enhance the malignancy process. Pentraxin 3 (PTX3) is one of the latest biomarkers of lung cancer. It is an acute phase protein that reflects the development of inflammation in the tumor microenvironment. Literature data suggest that low PTX3 levels are associated with a small risk of lung cancer development. However, further research is needed to help determine the clinical usefulness of the biomarker.

### **Keywords:**

lung cancer, inflammation, pentraxin 3



## PHYSIOTHERAPY LEVEL IN MULTIPLE SCLEROSIS AS AN ASPECT OF HEALING

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### **Abstract:**

The number of MS patients in the world exceeds 2 billion, and currently around 60,000 people in Poland are ill. The highest incidence is recorded in caucasian people . Women suffer more often from MS than men. It is most often detected between 20 and 40 years of age. There are several forms of this disease: relapsing- remiting - 60%, secondary, primary- progressive, primary- progressive. Rehabilitation goals: maintaining proper physical fitness, improving physical fitness, improving socjal fitness. Comprehensive rehabilitation effectively reduces the effects of the disease, movement based on patterns of conduct in line with European Union standards and recommendations (Guidelines). One of the many methods that can be specified is hydrotherapy. An innovative method of cooling ( cooling) cold hydrotherapy. The most important physiological effects are local and systemic reactions to heating or cooling, reactions to immersion of the body in water. Aims of using various methods for interactions reducing chronic pain.

Summary: Physiotherapy should be included in the comprehensive treatment of patients suffering from spasticity in the course of SM as an equivalent element of symptomatic treatment alongside pharmacotherapy. The regularity of physiotherapy nad family support is important in the healing of patients with SM.

### **Keywords:**

MS, rehabilitation, hydrotherapy, cooling hydroterapia, physiotherapy



## **INTERDISCIPLINARY CARE FOR THE PATIENT IN THE PERIOPERATIVE PERIOD - ERAS PROTOCOL AND REGIONAL ANALGESIA**

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### **A few words about the author:**

I am a PhD student for 3 years. I work as a nurse.

### **Abstract:**

Each surgery is a kind of trauma for every organism. Postoperative pain is an acute pain resulting from the disruption of tissues and organs, as well as from various types of manipulation of visceral structures (stretching, crushing) performed during the procedure.

The intensity and extent of pain felt by a patient depends on the location, extent of the procedure, the degree of traumatization of the tissues and the analgesia techniques used. The attitude of medical staff also affects the level of pain. An appropriate attitude, that gives a feeling of security (e.g. conversation between the medical staff and the patient about the course of surgery, and possible postoperative pain or complications) causes that makes the patient is calmer, does not feel anxiety, and his or her subsequent treatment is shorter and more effective. Neurotic people with a sense of fear, anxiety or loneliness may feel pain more strongly and more often. Postoperative pain is better tolerated by older people than younger ones. The reason for this may be an increase in the pain threshold with age. Women are also more sensitive to pain, which is caused by a lower pain threshold.

Properly selected analgesic therapy is of key importance in the postoperative period, because inadequate therapy can lead to many physiological disorders resulting in further postoperative complications, which may eventually lead to the patient's death.

### **Keywords:**

analgesia, ERAS, interdisciplinary care, surgery



## CHRONIC WOUND CARE - TIME STRATEGY

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### **Abstract:**

Chronic wounds are a growing problem of healthcare systems. The problem of infection and treatment of chronic wounds has been present in medicine for centuries. There one preserved records of Aztec doctors who healed wounds by wrapping them in tobacco and agave leaves. Hippocrates, on the other hand, recommended a dressing to protect the wound from further damage. The ancient Greeks were the first to create a classification of wounds, calling them respectively: fresh wounds and non-healing wounds. Many factors have been reported to promote infection, but the risk of septic wound complications should be divided into three basic groups. The first relates to the properties of the microorganism causing the infection. The second is the general condition of the patient - his nutrition, age, immune disorders, metabolic diseases, stress, alcoholism, nicotinism and tissue ischemia. The last one is improper treatment, lack of antibiotic prophylaxis, and inadequate wound care.

The TIME strategy provides a holistic approach to wound healing, as well as gives methods of clinical wound assessment and selection of the best treatment method.

Increasing the effectiveness of chronic wound treatment requires organization and implementation of a comprehensive therapy scheme focused first on etiologic factors and then on local actions.

### **Keywords:**

TIME strategy, wound, treatment, holistic





## PLEIOTROPIC EFFECT OF VITAMIN D – CURRENT KNOWLEDGE

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Jarosław Nuszkiewicz is a PhD student at Faculty of Medicine, Ludwik Rydygier Collegium Medicum in Bydgoszcz. Interested in oxidant/antioxidant balance, role of vitamin D and melatonin in homeostasis.

### **Abstract:**

Vitamin D was discovered by Adolf Windaus in late 1920s. This group of fat-soluble steroids can be absorbed from food but its main source is in vivo synthesis. First stage of calcitriol (1,25-dihydroxycholecalciferol) synthesis, a biologically active form of vitamin D, is transformation of 7-dehydrocholesterol in the skin under the influence of ultraviolet rays. That is why vitamin D is sometimes called "sunshine vitamin". Further chemical changes take place in the liver and kidney - as a result of enzymatic activity, two hydroxyl groups are attached to the cholecalciferol molecule.

Vitamin D is traditionally connected with calcium and phosphate homeostasis as well as the maintenance of normal bone structure but a much greater role of calcitriol has been revealed in new studies. Vitamin D receptor (VDR), found in almost all tissues, belongs to nuclear receptors and transcription factors. Vitamin D significantly affects the functioning of the immune system. Low levels of vitamin D are associated with autoimmune diseases, such as Crohn's disease. In cancer, this vitamin has antiproliferative activity and prevents the formation of cancer cells, affects apoptosis and angiogenesis. Few scientific reports point to a link between vitamin D deficiency and cardiovascular disease. In obesity and type 2 diabetes, calcitriol affects insulin secretion by reducing the inflammation of the pancreas.

### **Keywords:**

vitamin D, inflammation, cancer, type 2 diabetes



## **IDENTIFICATION OF METABOLITES RESPONSIBLE FOR DISEASE STATES**

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Patryk Mitelsztet is a student of the Faculty of Medicine in Wrocław. Since 2019, he has been active in SKN Pathomorphology, where together with Dr. Marta Woźniak and Siddarth Agrawal they conduct research on human metabolome.

### **Abstract:**

In Poland, more than half of Polish seniors are affected by at least three chronic diseases. These results are deterioration of functioning, isolation from the environment, worse prognosis, and higher mortality. Due to the widespread occurrence of the problem of multidisease, therapeutic management is often difficult due to the need to implement multi-level treatment. The multitude of ailments and medical conditions reported by patients is a challenge in the comprehensive care of the elderly.

This study aims to identify metabolites associated with the aging process, physical fitness and intellectual potential of the elderly. The study will be conducted on a group of patients admitted to the Geriatrics Clinic of the Medical University in Wrocław. The analyzed data will include disease loads, BMI, selected biochemical and imaging results. Patient serum was used for metabolic studies.

It is expected that the results of research work may help in the diagnosis, selection of effective therapy, monitoring the course of the disease and treatment, which will result in an increase in life expectancy and comfort.

### **Keywords:**

geriatrics, metabolomics, diseases



## THERMAL IMAGING METHODS AND THEIR APPLICATION IN THE ASSESSMENT OF THE QUALITY OF MICROBIOLOGICAL FOOD

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### **Abstract:**

The aim of the study was to evaluate the possibility of using measurements from a thermal imaging camera to monitor the development of microbiological contamination in food on the example of hazelnuts. The following mold species were used in the studies: *Aspergillus niger* ATTC 9142, *Penicillium expansum* ATTC 7861 and *Fusarium* sp. The study included the determination of dry matter content in nuts by the use of the drying and weighing method; determination of the total number of molds by the cultivation method and monitoring of mold growth with the use of thermal imaging camera measurements during 6 weeks of storage. The thermographic camera VIGOCAM v50 was used to perform the measurements.

It was observed that the number of mold spores affects temperature. A negative correlation between the number of mold spores and the temperature recorded by the thermal imaging camera was found for six out of seven samples of hazelnuts contaminated with the particular species of mold. A positive correlation was observed in nuts contaminated with *Penicillium expansum* mold. It was also noted that sterile nuts had a higher temperature than those contaminated with selected species of filamentous fungi. Therefore, it can be concluded that the growth of microorganisms and the structure of the overhead plexus results in a change of energy emitted from the tested samples to the environment, and also has a huge impact on the method of heat migration.

### **Keywords:**

thermography, detection, microbiological quality of food



## **ORIENTAL FOOD - KNOWLEDGE OF THE ISSUE AND PREFERENCES AMONG POLISH CONSUMERS**

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### **Abstract:**

The aim of the research was to determine the opinions and preferences of consumers in the field of oriental fermented food, examine the frequency and structure of consumption of these products and their availability on the Polish market.

The data analysis was based on a questionnaire survey of 750 respondents. The questionnaire consisted of three parts. The first part of the survey was aimed at checking whether consumers know the terms "fermented food" and "oriental food". In the second part of the survey, photos and short descriptions of selected oriental products were presented. In the last part basic sociodemographic questions were included, in which respondents were asked about gender, age, place of residence and level of education.

The studied population had almost twice as many women as men. In the context of the presented opinions of the studied population, it can be stated that the notion of fermented food is best known among educated people who are over 26 years of age. Consumers of oriental food are assessed as people aged 26 to 50, living in a large urban center, who are white-collar and freelance workers.

The high price, compared to conventional food as assessed by consumers, limits the demand for this type of food. However, more than half of those surveyed estimated that regular consumption of fermented oriental products can have a positive effect on the digestive system and provide many vitamins, micro, and macroelements.

### **Keywords:**

fermented food, oriental food, preferences of consumers



## **BIOCOMPLEX OF BACTERIAL CELLULOSE AND DIHYDROXYACETONE AS A MATERIAL THAT MINIMIZES THE SYMPTOMS OF VITILIGO**

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### **A few words about the author:**

Master of Science in biotechnology in the food industry. Interests related to microbiology and organic chemistry (green chemistry).

### **Abstract:**

The goal of this study was assess the possibility of using bacterial cellulose (CB) with the addition of dihydroxyacetone (DHA) as a biomaterial in relieving the symptoms of vitiligo. The cultivation of acetic bacteria from the species *Gluconacetobacter xylinus* resulted in obtaining CB in the form of patches. Obtained biomaterial was incubated in solutions with different concentrations of DHA ( $\text{gL}^{-1}$ : 20, 50, 80, 110) for 24 hours at 22°C. After this time, CB was applied onto the skin for 15, 30 or 60 minutes. The changing of skin colour was assessed visually in comparison to the control which did not contain DHA. Skin color was observed depending on the applied DHA concentration and the time of biomaterial application. The intensity of the color (from lighter to darker shades of brown) increased with the increase in the concentration of DHA as well as the time of application of the patches. The study showed that CB can be an effective carrier of DHA. The research carried out suggests that the proposed biomaterial could (in the future) be used to minimize the symptoms of vitiligo.

### **Keywords:**

bacterial cellulose, dihydroxyacetone, vitiligo, biomaterial



## **AN EFFECT OF COMMERCIALY AVAILABLE NANO-COPPER AND NANO-GOLD COLLOIDS ON THE REPRODUCTION AND SURVIVAL OF NEWBORN DAPHNIA PULEX**

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### **A few words about the author:**

PhD student at the University of Szczecin.

### **Abstract:**

Increased accessibility and growing popularity of commercially available solutions of nanoparticles results in their increasing production and, consequently, also in higher emission to the environment. The aquatic environment, as the ultimate location of pollutants, is particularly vulnerable to contamination by nano-copper and nano-gold. Planktonic organisms, as the basis for most food networks in the aquatic environment, are particularly vulnerable to water pollution. The impact of nanocolloids on the aquatic environment is not yet well recognized. The aim of the study was to determine the effect of commercially available copper and gold nanocolloids on the reproduction and survival of newborn *Daphnia pulex*. The experiment was performed 10 times, each time using 5 adult water flea organisms incubated in a series of dilutions of Cu-NPs and Au-NPs. Their reproduction and the number of live and dead newborns after 24 and 48 hours of culture were observed. It was proved that the addition of nano-copper at concentrations of 0.0625 mg/L and 0.125 mg/L resulted in increased multiplication of *D. pulex*. After 48 h of incubation of newborn water fleas in nano-copper solutions, the most toxic concentration of Cu-NPs was 0.5 mg/L. Au-NPs in concentration of 0.0625 mg/L turned out to be the most toxic for newborns and Au-NPs in concentration of 1 mg/L turned out to be an inhibitor of reproduction of *Daphnia pulex*.

### **Keywords:**

*Daphnia*, nano-copper, nano-gold, zooplankton, ecotoxicology



## VALUE OF ASSESMENT OF BEEF CATTLE

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### **A few words about the authors:**

Employees and PhD students of Department of Animal Breeding, Faculty of Animal Breeding, Bioengineering and Conservation, Institute of Animal Science, Warsaw University of Life Sciences.

### **Abstract:**

The assessment of the value of beef utility cattle is carried out in Poland by the Polish Association of Breeders and Producers of Beef Cattle on the basis of methodology for assessing the utility value of beef utility type cattle developed by the Polish Association of Breeders and Producers of Beef Cattle and submitted Minister of Agriculture and Rural Development.

This methodology has been developed based on the following legal acts:

1. The Act of 29 June 2007 on the organization of animal breeding and reproduction farm (consolidated text, Journal of Laws of 2007, No. 133, item 921)
2. Commission Decision 2006/427 / EC of 20 June 2006 establishing methods of assessing utility value and methods of assessing genetic value pure-bred breeding animals of the bovine species (OJ L 169, June 22, 2006, p. 56).
3. ICAR guidelines (International Committee for Animal Recording).

Evaluation of the utility value of beef cattle conducted is method C, where all entries in the current documentation breeding and determining the degree of muscle and development of the animal are made by an authorized employee of PABPBC, and measurements zoomimetric and weight determination of animals can be done by the animal owner.

### **Keywords:**

livestock, value of assessment, beef cattle, bovine



## **THE POLISH ASSOCIATION OF BREEDERS AND PRODUCERS OF BEEF CATTLE**

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### **A few words about the authors:**

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### **Abstract:**

The Polish Association of Breeders and Producers of Beef Cattle is the only full representative of the beef cattle breeders and producers community in Poland. It was created in 1994 as a result of a grassroots movement of beef cattle breeders and producers in order to decentralize and socialize cattle farming.

The association represents the rights and interests of beef cattle farmers. Is an organization of over 1000 members. These are individual breeders, state-owned farms, state-owned and private companies, cooperative and leased farms. The association cooperates directly with organizations related to cattle breeding in the country and abroad. Since July 1, 2002, the Polish Association of Breeders and Producers of Beef Cattle is the only entity in Poland authorized by the Minister of Agriculture and Rural Development to keep books and evaluate beef cattle breeds.

PABPBC is a self-governing and independent organization uniting breeders and producers of beef cattle breeds, in its activities it is guided by the principle of equality of members.

### **Keywords:**

livestock, polish association, beef cattle, breeder





## **THE COW BREED AS THE FACTOR DETERMINING THE FORMATION OF USABLE INGREDIENTS IN MILK**

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### **A few words about the author:**

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### **Abstract:**

The production of milk is the main direction of using cattle in Poland. The raw material obtained from cows is used for the manufacture of products consumed by people. High quality of raw material depends on a number of factors, mainly environmental ones, among which one should mention health state and the level of feeding the animals. Apart from environmental factors, a significant role in the quality of raw material is also played by genetic factors, including, inter alia, the breed of animals from which milk is obtained. The quality of the raw material is evaluated on the basis of essential composition or, in other words, usable ingredients of milk, especially fat yield (kg), protein yield (kg), dry matter yield (kg) and the number of somatic cell count. The aim of the paper is to indicate the cattle breed in the case of which milk is the most useful for processing purposes. Milk yield, as well as fat and protein yield were subject to analysis, and the content of these ingredients in milk from the cattle breeds used in Poland for the production of milk from the active population was analyzed. The research indicated the differences both in milk yield and in the formation of particular usable ingredients in milk.

### **Keywords:**

breed, milk, fat, protein, dry matter



## **THE CHANGES IN DAILY MILK PRODUCTION AND THE FORMATION OF USABLE PARAMETERS DURING THE LACTATION IN HIGHLY PRODUCTIVE COWS OF PHF BREED**

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### **A few words about the author:**

PhD student for Institute of Animal Sciences.

### **Abstract:**

Milk is the main raw material obtained from cows in Poland. Its high production is the result of the breeding work which is carried out consistently towards the improvement of milkability of cows. The obtained raw material is used for the manufacture of multiple products consumed by people and therefore, it is significant that it is of the best quality. In order to obtain the raw material of good quality, first of all, cows must be healthy. The main cause of all diseases is the occurrence, in the initial phase of lactation, of metabolic diseases connected with negative energy balance. In order to prevent it one should constantly monitor the metabolic status of cows. Firstly, however, one should ensure suitable level of feeding for the animals. The aim of the paper was the evaluation of changes in daily milk production and in formation of the usable parameters during lactation, as the factors determining technological usefulness of milk and production demand. The analysis has indicated the changes in daily production of milk and in formation of the usable ingredients in particular phases of lactation, which should constitute an inducement for the correction of food ration for cows. In conclusion, the phase of lactation exerts a significant influence on daily milk production and on the formation of the usable ingredients' level.

### **Keywords:**

PHF breed, high production, milkability



## **THE USE OF DIETARY FIBER TO SHAPE HEALTH, SENSORY AND TECHNOLOGICAL PROPERTIES OF CEREAL-GRANULAR SNACKS**

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### **A few words about the author:**

I am a second year PhD student at the Warsaw University of Life Sciences (SGGW), Department of Food Engineering and Process Management. My previous studies concerned the risk and hazard analyses, modeling of technological processes and of new products.

### **Abstract:**

Since dietary fiber is a valuable element of the diet, methods have been developed to enrich various groups of food, including bakery products. The addition of fiber affects the water absorption, acidity, stability, color, texture, aroma of food. The conducted research concerned an attempt to develop a recipe and technological process for the production of cereal-granular snacks with the addition of vegetable fiber (apple, cocoa, psyllium). In addition to health benefits, this treatment aims to achieve sensory and technological benefits consisting in shaping the appropriate structure of snacks to eliminate flour and thus gluten from the recipe. The results of consumer tests, color measurement as well as water activity and sorption properties after baking and 1 and 3 months after baking were presented. The lowest value of water activity was obtained in case of samples with psyllium fiber addition, it was also influenced by a high degree of water binding, texture and attractive color of bars. Consumers rated the taste of bars with the addition of apple fiber the highest, and the lowest those with cocoa fiber. In the case of texture (softness, brittleness, cohesiveness), bars with psyllium fiber were rated the highest, and the lowest with the addition of a mixture of apple fiber and psyllium. Studies of sorption properties for most samples showed a moderate increase in equilibrium water content with an increase in water activity to a level of 0.8, followed by a significant increase.

### **Keywords:**

dietary fiber, healthy snack, apple fiber, Psyllium fiber, cocoa fiber



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## **BIOCOMPATIBLE AND BIODEGRADABLE COPOLYMERS WITH LACTIDE**

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### **A few words about the author:**

Phd student.

### **Abstract:**

Biodegradable polymeric materials obtained in the process of copolymerization with lactides and due to the specific properties are widely used in many areas of biomedicine. Biocompatible and biodegradable copolymers proved useful for application in medicine, as materials for drug carriers formation in the process of controlled drug release, temporary implants used in surgery and scaffolds for application in tissue engineering. In this work the possibility of obtaining biodegradable copolymers which contain in the copolymer chain microstructure typical lactide units as well as blocks of succinate and citrate of butylene is presented. These segments make obtained material very flexible and much more hydrophilic in comparison with homopolymer of lactide and most known lactide's copolymers. Such chemically modified copolymers of lactide marked by its features may become very valuable material in forming systems for controlled release of drugs or in creating porous scaffold used in cells engineering. Currently quick progress in medicine requires the need of new biodegradable materials with new mechanical and physicochemical properties.

### **Keywords:**

copolymers, biodegradable polymers, scaffold, biomaterials, lactide



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## **VERTEBROPLASTY AND KYPHOPLASTY USED FOR COMPRESSION FRACTURES TREATMENT**

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### **A few words about the author:**

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### **Abstract:**

Transdermal surgical techniques are widely used to treat compression spinal fractures caused by various pathologies such as primary and secondary osteoporosis, hemangioma or multiple myeloma. Vertebroplasty and kyphoplasty treatments are minimally invasive and at the same time very effective methods to treat vertebral compression fracture. Both treatments effectively reduce pain, although this mechanism is not fully explained. Bone cement on the PMMA matrix is currently the most frequently used filling material due to its advantages. Despite the high efficacy of vertebroplasty and kyphoplasty treatments, as with any treatment may also have an adverse effect in the form of side effects and complications.

### **Keywords:**

vertebroplasty, kyphoplasty, bone cement



## **INFLUENCE OF IRON ALLOTROPY ON THE POSSIBILITY OF MANUFACTURING THE TERNARY METAL HYDRIDE**

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### **A few words about the author:**

I am a PhD student. My faculty is Material Engineering. My research area is hydrogen storage, especially in solid phase. My interests are mainly science (materials science, chemistry, mechanics) but also sport and an active and healthy lifestyle.

### **Abstract:**

Ternary metal hydride in the form of  $Mg_2FeH_6$  is a very well known compound which is used for many years in hydrogen storage technologies. This compound has, the highest known in all hydrogen compounds, volumetric hydrogen density of  $150 \text{ kg/m}^3$  and the gravimetric hydrogen density of 5.46 %. However in its manufacturing process is used mostly alpha allotropic form of iron, which is characterized by the body centered cubic (BCC) crystal lattice structure. It is well known, iron also has another allotropic form with the face centered cubic crystal lattice (FCC) structure, which is stable at temperatures above  $910^\circ\text{C}$ . Thanks to suitable alloy additives (for example nickel, manganese or cobalt) it is possible to stabilize the austenitic structure at room temperature. Therefore, the major task of the presented work is to identify process of innovative manufacturing  $Mg_2FeH_6$  in which as a substrate of the reaction used gamma iron.

### **Keywords:**

hydrogen storage, iron allotropy, ternary hydride, magnesium hydride



## **INFLUENCE OF THE UNIT CELL PARAMETERS ON EQUILIBRIUM PRESSURE IN HYDROGEN STORAGE MATERIALS**

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### **A few words about the author:**

I am PhD Student of material engineering at Military University of Technology. My research are focused on hydrogen storage materials and previously my master and engineer work consist of 3D printing technology.

### **Abstract:**

AB5 alloys are widely studied for solid hydrogen storage materials, it is related to their properties which are the ability to storing hydrogen in the range of 1 to 1.3%, what is important, it is possible to handle the process in temperature and pressure close to atmospheric.

LaNi<sub>5</sub> alloys can be included in the group of materials described above. There are many research works that focus on replacing both lanthanum and nickel atoms to change material properties.

In the presented studies, the effect of unit cell parameters, changing under the influence of substitution of lanthanum atoms with cerium atoms, on changes in equilibrium pressure was examined. Hydrogen absorption and desorption isotherms were carried out at various temperatures.

### **Keywords:**

hydrogen storage, hydrogen energy, solid state storage



## **INFLUENCE OF LEAD GLASS ON THE PROPERTIES OF FAST CRYSTALLIZED 7475 ALUMINUM ALLOY**

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### **A few words about the author:**

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### **Abstract:**

The work contains research on the plastic consolidation of fast-crystallized 7475 aluminum powder and lead glass powder. The issues concerning aluminum characteristics, in particular alloy 7475, methods of rapid crystallization, plastic consolidation and methods of composite production on the example of the process of concurrent hot extrusion and the characteristics of the glass phase were discussed.

As part of the research, two rods were produced in the hot plastic consolidation process. One of them was a rod made of fast-crystallized 7475 aluminum powder and the other was a metal-glass composite with the addition of 10% lead glass powder. Then the light microscope and scanning electron microscope tests were carried out. Tests were also made of strength properties, hardness, chemical composition and density of obtained rods.

### **Keywords:**

plastic consolidation, powders





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