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PREFACE

It is a tradition that the **MendelNet Conference** for undergraduate and postgraduate students is hosted by **Faculty of Agronomy** in the end of the year. From the first year, in 1996, it went by considerable progress reflected faculty life and events. Probably the most important change of the conference image is gradual increases of the sections number, connected with the implementation of new courses. Recently, increased number of the participants is welcomed, from our University, from partner universities in the Czech Republic and from abroad, respectively.

The mission and the aims of the Conference continue. It provides the students the opportunity to present their contributions in face of their colleagues and the scientific commissions. The students acquire the experiences with active presentation and defence of the results obtained from research on diploma and doctoral thesis. The discussions among the participants and the students are very valuable because it is the best training procedure for proper thesis defence in face of the commission. The **MendelNet´08 Agro Conference** is an ideal form for scientific survey acquirement in given specialization.

Prof. Ing. Ladislav Zeman, CSc.

Dean of FA MUAF in Brno

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THE PROCESS AND DEVELOPMENT OF PHENOPHASES OF SELECTED PLANTS IN SOUTH MORAVIA IN 1961 - 2007

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Abstract: Phenology is important indicator of climate progression and variability of meteorological values, especially temperature. The aim of our work is to process and assess, which meteorological parameters could be consider as driving variables determining the length and developmental rate of individual phenophases. And process how observed phenophases have changed in 1961 - 2007. As the phenophases in the agrosystems are influenced by human activity we used uncontrolled ecosystem as a modeling ground in order to develop robust and reliable methodology.

We have observed phenophases (bud bursting and full leafing) of oak tree (Quercus robur L.) and wild garlic (Allium ursinum L.) first flower and full flowering on research plot of flood plain forests in southern Moravia since 1961 till now.

In order to process the data we used computer tool FenoClim, which was developed at Institute of agrosystems and bioclimatology. FenoClim allows to easily determine climate variables that are driving onset and/or duration of specific phenophases (e.g. start and end of flowering or start of bud bursting and full leafing directly).

Statistical analysis showed that Tavg and Tmax influenced the length of phenophases of Quercus robur and Allium ursinum most significantly. Tmin and Srad influenced the length of phenophases less; Day-length and Rain has no significant influence on length of studied phenophases. The start of Quercus robur bud bursting has shifted to the earlier time by 9,4 days. The start of first flower of Allium ursinum has advanced by 9,6 days.

Key words: phenology, length of phenophases, temperature, Quercus robur, Allium ursinum

Acknowledgments: We gratefully acknowledge the support of the Grant Agency of the Czech Republic (no. 521/08/1682), Research plan No. MSM6215648905 “Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change“ and of KONTAKT OC187 (linked to COST 734) that enabled data collection and development of the FenoClim software used in the study.

INFLUENCE OF MAIZE CROP´S CONCENTRATION TO BIOGAS PRODUCTION

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Abstract: Maize hybrids Benicia (FAO 300) and Saxxo (FAO 400) are compared in two seeding amount and in this report. These hybrids are both recommended for biogas production. The aim of this experiment is to learn yield of green biomass per 1 ha, yield of dry matter per 1 ha, biogas production per a day and biogas production per 1 ha. Field trial is held in Research station in Červený Újezd close to Prague. Maize biomass fermentation takes place in Research Institute of Agricultural Engineering in Prague. Pork slurry and medium from biogas station in Kněžice are used to inoculation.

Variant Benicia 110 has higher yield of green biomass per 1 ha – 78,7 t , higher yield of dry matter per 1 ha - 30,5 t, higher production of biogas per 1 ha – 7576,2 m3 than variant Benicia 80. Variant Saxxo 90 has higher yield of green biomass per 1 ha – 69,8 t, higher yield of dry matter per 1 ha – 23,7 t, higher production of biogas per 1 ha – 8472,8 m3 than variant Saxxo 70.

On base of this experiment is possible to say, that for biogass production is better to use higher seeding amount.

Key words: maize, biomas, slurry, yield, production

THE COMPARISON OF SEVERAL SOIL CULTIVATION METHODS IN THE TOKAJ-WINE REGION

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Abstract: Our results show that the different cultivation methods have higher effect on the yield than on the grape quality.

The several cultivation methods have effect on the nitrate +nitrite content and the compaction of the soil. The mechanical cultivation helps to decompose the organic matters in the soil, but in some cases the nutrients infiltrate in the deeper layers and became unavailable to the grapes. This cultivation method causes soil compaction only in the subsoil. In this point of view, the straw mulch proved to be the best solution, but the results indicate, that it has to be renewed regularly.

In 2008 the straw mulch proved to be the best solution regarding the yield. As it appears from the results, the soil cultivation method has an effect also on the temperature and relative humidity in the foliage, influencing the ratio of noble rotted berries.

Key words: straw mulch, barely cover crop, erosion, soil compaction, noble rot

SCALE INSECTS (COCCOIDEA) - PESTS OF ORNAMENTAL PLANTS IN HOUSEHOLD

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Abstract: The aim of this work was to compare occurrence of scale insects (species and their host plants) in greenhouses and households. The investigation of scale insects on ornamentals was carried out at various households in Brno. Six species belonging to 3 different families have been found on 48 plant samples from 25 households between 2007/2008. Planococcus citri (on 11 families / and 20 samples), Rhizoecus cacticans (1/1) (Pseudococcidae), Coccus hesperidum (6/18) (Coccidae), Aspidiotus nerii (4/6), Diaspis boisduvalii (1/2), D. echinocacti (1/1) (Diaspididae) were assigned on plants in households. The investigation of scale insects at various localities of greenhouses in the Czech Republic is still in progress but as one of the preliminary results can be said that the number of scales in households are generally lower than in greenhouses. It depends upon form of collecting samples. The species were mostly mealybugs, producing visible waxy covering or brown soft scale, which form wax covered tortoise-shaped scale that can be easily found. The protection of household plants is focused on using less toxic methods (horticulture oils, ethanol, soap emulsion), which eliminate the scales slowly and need a long time and frequently repeated applications.

Key words: ornamental plants, Coccidae, Diaspididae, Pseudococcidae, household pests, Czech Republic

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COMPARISON OF PHOTOSYNTHETIC ACTIVITY IN CULTURE AND WEED BEETS

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Abstract: We monitored photosynthetic activity and respiration in plants of weed beets and in culture plants of sugar and feed beets in growth phase of 18 BBCH (8 genuine leaves). Culture and weed plants reached the highest values at 2 p.m. and their average was 8 μmol of CO2 m-2 s-1. Differences in photosynthesis intensity are visible in the afternoon hours, when weed beets reach higher values. In the afternoon hours it was opposite. Also we can say, that during all day, the plants of weed beets had higher transpiration and their value reached maximum of 1,47 mmol of H2O m-2 s-1. In comparison of culture and weed plants it is evident, that weed beet is a large competitor of culture beets, also in photosynthesis intensity.

Key words: Beta vulgaris, weet beet, photosynthesis activity, daily running

INFLUENCE OF SELENIUM APPLICATION ON YIELD OF POTATOES *(Solanum tuberosum)* AND ITS CONTENT IN TUBERS AFTER HEAT TREATMENT

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Abstract: In small-plot experiment with potatoes was explored the effect of foliar applications of Se (200 and 400 g $Se.ha^{-1}$) and applications of Se into the soil on tuber yields, the Se concentration in dried tubers and boiled tubers and in chips and effect of Se applications on concentration of semiessential amino acids arginin and histidin in dried tubers. Varieties Ditta and Karin were used in the experiment and selenium was applied in the form of sodium selenite (Na_2SeO_3). 5 treatments were used in the experiment: (1) control; (2) 12 kg $Se.ha^{-1}$; (3) 24 kg $Se.ha^{-1}$; (4) 200 g $Se.ha^{-1}$; (5) 400 g $Se.ha^{-1}$. The total yields of tubers per ha were the highest in the control treatments. The variety Ditta produced higher yields. The average content of Se increased with the applied dose as compared to the control. The effect of Se applications on amino acids concentration in tubers was only in the case of His. The concentration of Arg and His was the sign of the variety.

Key words: selenium, application, potatoes, yield, quality, amino acids

Acknowledgments: This study was elaborated as a part of the research order NAZV No. 1G46058 “Strengthening the competitiveness of potato growers through production of tubers with a higher consumer quality”.

EFFICACY OF DIFFERENT FUNGICIDE PROGRAMMES AGAINST LATE BLIGHT OF POTATO IN SELECTED VARIETIES

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Abstract: The scientific work was aimed at the most worldwide important and dangerous pathogen of potato (*Solanum tuberosum* L.), *Phytophthora infestans* (Mont) de Bary from kingdom *Chromista*, which causes the disease, called late blight of potato. It can cause important losses of yield and quality of potato tubers. The main aim of this work was to evaluate efficacy of several fungicide programmes against this pathogen. These programmes were evaluated in several potato varieties (Adéla, Asterix, Bionta, Kordoba, Magda, Minerva, Rosara, Solara, Riviera) in the years 2006 and 2007. According to results, the meteorological conditions of particular year influenced the infection of potato plants. It is necessary to adapt pathogen control in connection with different meteorological conditions. Fungicide programmes with early control (before negative forecast) and control according to forecast were the most efficacious in the majority of potato varieties in the year 2006. The sequence of fungicides in this programme was Ridomil Gold MZ 68 WP (metalaxyl-M 4% and mancozeb 64 %), Casoar (prophamocarb-hydrochloride 375 g and chlorothalonil 375 g), 3 x Altima 500 SC (fluazinam 500 g). We can conclude from general evaluation, that programmes with early and intensive control by the most efficacious fungicides should be applied on stands with susceptible varieties.

Key words: fungicides, varieties, Solanum tuberosum, Phytophthora infestans

Acknowledgments: This work was supported by the NAZV – QG 50055.

ASSESSMENT OF HERBICIDE EFFICACY BY MEASURING CHLOROPHYLL FLUORESCENCE

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Abstract: The possibilities of efficacy detection of three selected herbicides were determined by measuring of chlorophyll fluorescence parameters using FluorCam (fluorescence camera). Application of selected herbicides BASAGRAN SUPER (2 l/ha), CALLISTO 480 SC (0.25 l/ha) + ATPLUS 463 (0.5%) and CLICK 500 SC (2 l/ha) was done in registered doses in growth period of four right leaves of redroot pigweed (Amaranthus retroflexus) plants. Quantum yield (QY) was selected as an assessing parameter of chlorophyll fluorescence, which was compared with subjective assessment and growing parameters. Measurements were done 0, 1, 2, 3, 6, 9 and 15 days after treatment.

The obtained results showed that it is possible to detect each of selected herbicides by measuring parameters of chlorophyll fluorescence. Effect of herbicide BASAGRAN SUPER was detected as first, already several minutes after application compared to detection by subjective assessment after 1 day after treatment. Herbicide CLICK 500 SC was detected first day after treatment compared to detection by subjective assessment after 3 days after treatment. Detection on herbicide CALLISTO 480 SC was same for quantum yield and subjective assessment - 3 days after treatment. Obtained results showed that we can detect effect of herbicides BASAGRAN SUPER and CLICK 480 SC even before visible damage of weed plants.

Key words: herbicide efficacy, chlorophyll fluorescence, fluorcam

Acknowledgments: This study was supported by the Research plan No. MSM6215648905 “Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change“, which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

ARGYRESTHIA THUIELLA AND A. TRIFASCIATA (*LEPIDOPTERA: YPONOMEUTIDAE*) – PESTS ORNAMENTAL CONIFEROUS TREE

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Abstract: Bionomics of Argyresthia species injurious on ornamental coniferous trees have been verified by breeding and monitoring of stadiums in laboratory and in the field on research areas: the castle park of Lednice, arboretum of the MZLU in Brno, arboretum in Nový Dvůr. Argyresthia thuiella overwinters as caterpillar in branchlets, it pupates in spring there. Moths fly since the last decade of Mai up to the second half of June. Imagoes of Argyresthia trifasciata fly since half May up to the middle June. Hibernating stadium is still finding out. Both species have in our territory one generation per year. Argyresthia thuiella was registered on Thuja occidentalis and T. plicata, Argyresthia trifasciata on Juniperus communis, J. chinensis, J. sabina and J. × median, J. squamata; it wasn't found on Juniperus conferta, Chamaecyparis. pisifera and Calocedrus decurrens.

Key words: pests of ornamental trees, *Argyresthia thuiella, A. trifasciata*

Acknowledgments: This study was supported by the Research plan No. MSM6215648905 “Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change“, which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

DIFFERENCES IN THE BOTANICAL COMPOSITION OF A GRASS STAND BASED ON THE MODE OF ESTABLISHMENT AND DIFFERENT INTENSITY OF EXPLOITATION

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Abstract: The stand was established in 1999 at the Research Station in Vatín by sowing a clover-grass mixture. In the period 1999 – 2005 the stand was mulched 3 times every year. In 2004 part of the stand (1/2) was treated with the "Roundup" herbicide and after the plants died off in the autumn of the same year the area was ploughed down. Part of the area was re-established in the form of controlled grassing – after ploughing down Roundup was applied and a clover-grass mixture was sown. Part of the re-established area was left for spontaneous grassing. On one part Roundup was applied and one part was not treated with Roundup. In all the variants two modes of management were used – mulching once a year and mulching 3 times a year. It was discovered that the botanical composition of a mulched grass stand established on arable land was greatly affected not only by the mode of establishment of the stand, but particularly by the frequency of cuttings. The mode of establishment affected the proportion of cultural species in the stand; the frequency of cuttings affected the light and water conditions, mulching affected nutrient cycling and the stage of succession affected the stability of the stand.

The first variant – original 8-year-old stand already in the stabilisation stage of succession had a high proportion of grasses, both in terms of the weight (more than 90 %) and number of species.

The variants of controlled and spontaneous grassing are going through the "quack-grass stage" with a prevailing dominance of dicotyledonous species in the controlled grassing variants and prevailing number of dicotyledonous species in spontaneously grassed variants.

The frequency of cuttings affected particularly the proportion of leguminous plants in the stand. In some variants which were mulched once a year the leguminous plants disappeared completely.

Key words: arable land, grass stand, spontaneous grassing, mulching

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THE INFLUENCE OF DEVELOPMENTAL STAGE OF POTATO PLANTS ON THE DETECTION OF POTATO LEAFROLL VIRUS (PLRV)

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Abstract: The work was aimed at elucidation of optimal date for detection of *Potato leafroll virus* (PLRV) in potato leaves by ELISA, the symptoms of disease and the effect of infection on the height of plants. The optimal term for PLRV detection was three weeks after tubers seeding in the greenhouse. In this term we obtained 97,6 percentage of positive results. There were 83,3 percentage and 76,2 percentage of positive results in the fifth and seventh week after tuber seeding. We did not find any correlation between expression of symptoms and relative virus concentration expressed as level of extinction in ELISA. Infection of potato plants by PLRV significantly influenced plant height.

Key words: Solanum tuberosum, Potato leafroll virus, ELISA, detection

Acknowledgments: This work was supported by the NAZV QH 71123.

THE INFLUENCE OF DIFERENCIAL MINERAL NUTRITION N, P, K, MG, S ON YIELD AND QUALITY BUNCH OF GRAPES IN VINECULTURE REGION OF TOKAJ

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Abstract: The nutritional experiment with application of N, P, K, S, Mg nutrients on the cultivars of Muškát žltý and Lipovina was established in locality Malá Tŕňa of Tokaj vineculture region. Agrechemical soil analysis showed slight acid to acid reaction, content of N_{an} was medium, content of phosphorus very low, content of available potassium very low to medium, content of calcium medium, content of magnesium high to very high, sulphur was low to medium, content of zinc was low to medium, content of manganese, iron was medium to high, and content of humus was very low to medium.

On the experiment was established 3 diffrent variant of the trial and the best economical parameters with cultivars Muškát žltý a Lipovina were achieved under the application of 50 kg nitrogen per hectar plus respective amount phosphorus, potassium and sulphur in the form of chloride-free of NPKS fertilizer. In this case, increment of yield in comparison to non-fertilized control represented 21.4 % and increase of profit in consequence of this combination of fertilizers aplication represented 17 407,- Sk.

Key words: grape- vine, macronutrients, micronutrients, Tokaj

BUFFERING ABILITY OF SELECTED SOIL TYPES

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Abstract: Buffering ability of soils is a significant soil property. It is an ability of soil to resist acids or bases entering the soil environment and maintain the soil pH within optimum limits.

The aim of the present thesis was to monitor different buffering ability of selected soil types and find significant correlations with other chemical properties of soil. The selected soil types included gleysol (GL), fluvisol (FL) and Phaeozems (PH). Other monitored soil properties included pH/H_2O, pH/KCl.

Samples of individual soil types were collected in eleven localities largely with arable soil, occasionally grassland. The soil samples were taken at depths equivalent to the depth of topsoil and subsoil.

The results of the monitoring show a considerable diversity of buffering ability of soil depending on soil type. Phaeozems has the highest buffering ability to acids while gleysol has the lowest. Gleysol, on the other hand, has the best ability to buffer bases, while phaeozems has the worst.

Key words: soil, buffering ability, chemical soil properties, soil reaction

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SOIL EXTRACTION BY HOT WATER AND CALCIUM CHLORIDE

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Abstract: Our objective was to compare different soil extraction methods; hot water extraction and extraction by 0.01 M $CaCl_2$ and to follow the changes in contents of nitrogen and carbon in longterm field experiment with different systems of fertilizing. Various systems of N fertilization strongly influenced the content and various forms of C and N in the soil. After the comparison of the evaluated treatments, the best results were obtained in both experiments in sewage sludge treatments. The application of sewage sludge gave the highest amounts of high-quality organic compounds. Hot water extraction method is stronger then 0.01 M $CaCl_2$ extraction and provides long-term information about N mineralization in the soil whereas extraction by 0.01 M $CaCl_2$ represent actual data of the content of easily mineralizable N compounds.

Key words: hot water extraction, extraction by 0.01 M $CaCl_2$, longterm field experiment, soil organic matter, mineralization

Acknowledgments: This work was supported by the NAZV 1G58027 and CIGA 21140/1313/3150.

LONG – TERM EVALUATION OF THE FLIGHT ACTIVITY OF RUSSIAN WHEAT APHID (*DIURAPHIS NOXIA KURDJ.*)

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Abstract: Aphids are serious pests of agricultural crops so the knowledge of their bionomics, flight activity and life cycles is very important for the agricultural profession. The collection of aphids was made in the way of Johnson-Taylor suction traps. Suction traps were situated in five locations (Čáslav, Chrlice, Lípa u Havlíčkova Brodu, Věrovany, Žatec). The temperatures were taken in the hight of 2 meters above the ground level. The aphids were collected every day from the beginning of April to the end of November. The aphids were put into bottles with 70% ethanol and sent to the central laboratory in Opava where the samples were further analysed. The separated aphids were processed in potash hydroxide and consecquently in lactic acid. The flight activity of Russian Wheat Aphid *(Diuraphis noxia Kurdj.)* has been monitored since 1997. The catches used to be trapped only in the warm localities Chrlice and Věrovany. Russian Wheat Aphid *(Diuraphis noxia Kurdj.)* was widely spread in 2007. Probably, the catches of Russian Wheat Aphid *(Diuraphis noxia Kurdj.)* will be below-average in 2008. The bionomic and migration of Russian Wheat Aphid *(Diuraphis noxia Kurdj)* is unexplored.

Key words: Suction trap, Russian Wheat Aphid *(Diuraphis noxia Kurdj.),* Monitoring

EARLY SWEET CORN PRODUCTION

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Abstract: In our trial we tried to find out how the time of propagation and transplanting influenced the growing season of sweet corn along with some major properties relevant to quality. The following technological variations were compared: transplanted plants with floating row cover (with 2 planting dates); transplanted plants with no row cover; direct seeded plants with no row cover. The transplant growing period reduced the growing period by 16 to 28 days, compared to the technology used in the existing practice of production. Earliness had a negative influence on ear weight, nonetheless it is worth while to attempt since the market is not so exacting with new products in the early period. In our trial the effect of earliness had a favourable influence in case of reducing- and total sugar content accumulation of seeds.

Key words: earliness, sweet corn, seedlings, fleece covering.

METHODS OF COMPILING LONG-TERM PHENOLOGICAL SERIES IN SOUTHERN MORAVIA

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Abstract: The main aim of the study was to analyze methods that would be applicable for analysis of long-term phenological records of plant species with importance for apiculture. As the first step ten of thousands of records from phenological yearbooks published between 1923 and 1960 were digitized into the easily accessible database. At selected cases digitized database was supplemented by latter phenological observations available at Czech Hydrometeorological Institute. In this way an example of long-term record was reconstructed for period 1923-1979 for sites in southern Moravia. In the next step the individual sites in digital databse were georeferenced in order to be used in GIS type of analysis, which allows more efficient use of scattered historical records. The analysis of long-term observations indicated some statistically significant trends toward earlier onset of phenological stages (in case of *Salix Capri, Cerasus avium* and *Cerasus vulgaris*) which is rather surprising given the fact that the period prior to 1980 has not been considered as being particularly affected by ongoing climate change. The first results indicate very high potential of properly used phenological datasets for regional climate change impact studies.

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Key words: phenology, Cerasus avium, trend analysis, phenological modelling, data reconstruction

COMPARISON OF SAAZ HOP WITH OTHER CULTIVARS AND HOP NEWBREEDINGS

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Abstract: In this article we evaluate hop plants of different cultivars regarding photosynthesis rate, yield and alpha - bitter acids (BA). In an experiment we monitored Saaz hop and newly growed, sometimes more effective, hop cultivars and newbreeding, mostly with higher bitter acids content, but with worse composition of compounds important for brewing industry. We established the experiment at experimental station of the Czech University of Life Sciences in Prague. Cultivars including prospective newbreeding were selected so we could cover all spectrum of cultivars from mild aromatic to high-content.

Regarding photosynthesis rate and yield the best was an old Czech cultivar Saaz hop – Osvald´s clone 72 from root-covered seedling. Prospective newbreeding proved to be newbreeding No. 4784 regarding yield and alpha - bitter acids content.

Key words: hop, cultivars, newbreeding, Žatecký poloraný červeňák, yield, alpha - bitter acids

QUASSIA AMARA IN THE FIGHT AGAINST APPLE SAWFLY

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Abstract: During May 2008 the efficacy of extract from tropical shrub wood *Quassia amara* L. against sawfly (*Hoplocampta testudiena*) were evaluated. Trial was located in apple orchard (variety Idared) in south Moravia. It was small-plot trial with five variants each has four replications. Control variant was treated only with water (400 $l.ha^{-1}$). Four variants with leach from *Quassia amara* had following dosages 3 $kg.ha^{-1}$; 4.5 $kg.ha^{-1}$; 2 × 3 $kg.ha^{-1}$ (after five days) and 9.25 $kg.ha^{-1}$. The highest efficacy was achieved with 9.25 $kg.ha^{-1}$ – 65.45%, followed by 4.5 $kg.ha^{-1}$ – 58.01%; 3 $kg.ha^{-1}$ – 55.02% and 2 × 3 $kg.ha^{-1}$ – 37.96%. All trial variants were statistically different from control variant.

Key words: apple orchard, sawfly, quassia amara, quassin, extract, hoplocampa testudinea

EFFECT OF MORPHOLOGICAL AND BIOLOGICAL CHARACTERS OF WEED COMPETIVENESS OF GENUS *TRITICUM* L.

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Abstract: Regulation of weeds is not easy and smooth thing in organic farming system, because the methods of chemical regulation of weeds are limited by the restrictions and legislative regulations. The protection againts weeds is based on the complexe measures. Wheat has a weak root system. It is not too competitive to weeds. More competitive varieties must be chosen at the initial selection (wide root system, faster initial growth, higher rate of tillering, etc.) Einkorn, emmer wheat and spelta wheat are characterized by better ability of tillering, therefore, they are more competitive to weeds, even if the seeding rate or emergence are lower.Current methods of the evaluation of the rate of weeds on the fields are not exact. Each variety may be evaluated from the point of view of the morphological, biological and economic features. After that, the competitiveness of the variety to weeds may be evaluated too. Each feature is evaluated during the growing season (when the crop is growing on the field).These morphological characters were evaluated: tuft shape (BBCH 29), position of flag leaf (BBCH 51), length of plant (BBCH 69), length and width of flag leaf (BBCH 77) and length of the upper internode (BBCH 83). These biological characters were evaluated: growing season: initial growth – speed (BBCH 10-52), growing season: from sweeping stage till ripeness (BBCH 10-92) and lodging degree (BBCH 29 and BBCH 87). In the field trial were 9 varieties of 4 kind genus wheat (*Triticum* L.). There were 2 varieties of einkorn (*Triticum monococum* L.): Schwedisches einkorn (J1) and J2118 (J2); 2 varieties of emmer *Triticum dicoccum* SCHUEBL): registered variety Rudico (D1) and Mestnaja (D2); 2 varieties of spelt (*Triticum spelta* L.): JŠ1 (Š1) and JŠ4 (Š2) and 3 varieties of wheat (*Triticum aestivum* L.) – 1 modern variety: SW Kadrilj (M), 1 obsolete: Jara (K) a land race: Postoloprtská land race(P). Each fields have area: 1.25 x 5 m (6.25 m^2). Sowing rate was 350 grains/ m^2 for all varieties. During the growing season was taken the rate of weeds by the combined method (counting and weighting). Morphological and biological characters had the effect of dry matter contents above-ground part of plant and weeds. Lodging in later growth time have effect of dry matter increase of weeds. These varieties: Jara (K), Postoloprtská land race(P), SW Kadrilj (M) and Rudico (D1) had futhers points. The rate of weeds is considerably reduced by a good selection of varieties which are competitive to weeds. We may avoid too high rate of weeds in such way.

Key words: wheat, weed, emmer, spelt, einkorn.

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Section – Animal Production

FACTORS AFFECTING METABOLISM OF DAIRY COWS

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Abstract: The aim of the thesis was to examine the influence of a daily ration on the levels of parameters found in metabolic profile of dairy cows. The influence of the composition of daily ration on various biochemical parameters was observed in eight farms. We would like to talk about calcium and phosphorus mainly.

It has been found out that the income of dry matter ranged from 15.969 kg to 21.733 kg per cow a day. The average intake of calcium was 187.055±39.358 g per cow a day and phosphorus was 88.186±11.691 g per piece a day.

With the use of correlation analysis it has been found out that the income of nutrients (dry matter, PDI, P and Mg) and energy influenced blood parameters (glucose, Ca, P, Mg, Zn, Cu). It has been found that the income of dry matter had a positive influence on Zn and Cu levels and negative influence on Na and Ca levels. The income of Ca had no effect on Mg, P, Na, Zn, Cu and glucose.

Minimal intake of calcium (6.2 g Ca per 1 kg dry matter) and phosphorus (3.2 g P per 1 kg dry matter) for dairy cow (600 live weight and less 25 kg milks) was kept. There were 9.6 g Ca per 1 kg dry matter and 4.53 g P per 1 kg dry matter on the average in feeding ration.

Rising intake of phosphorus leads to positive increasing of P in blood and positively influenced the level of Mg in blood.

Key words: calcium, phosphorus, feeeding ration, dairy cow

EXTERIER AND PRODUCTION CHARACTERISTICS IN GACKO CATTLE BREED

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Abstract: Captured dimensions from 2006 in Gacko cattle are compared to previous captured in similar research at 1956. Research shows that all exterior dimensions are increased. The most obviously growth is in live weight of cattle approximately 70% from 285 kg. Crest height growth from 112.26 to average 124.07 cm, body length from 129.07 to 143.00 cm, breast width grow up from 30.42 to 45.53, breast depth from 58.90 to 65.14 cm. Breast circumference growth from 153.90 for 23.79 cm at farm Planinsko Dobro and for 28.91 in SCG. Average rump height in Gacko cattle nowadays is 128.85 and it was 115.20. Seating pins length growth from average 36.34 to 43.37. Average circumference of shin bone is 19.81. Milk productivity is decreased from average 1160 kg for 237 days to 3820.51 kg for 305 days. Average daily production grows up from 60.23%.

Key words: Gatacko, cattle, exterior, milk production

EVALUATION OF IMPORTANCE OF FOREIGN BREEDS HORSES ON CZECH WARM-BLOODED HORSE

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Abstract: The aim of this work was the evaluation of influence of selected foreign horse breeds on the Czech Warmblood. Breeds are the Hannoverian, the Holstein, the Oldenburg, the Westphalian and the German Warmblood. For statistical evaluation we used the sport outcomes that were expressed by PPB rate (average helping points). This rate is based on the gained penal points in the competition and counted with the help of matrix that takes into account the difficulty of the competition in a form of helping points. Gained results were worked out with the method of GLM. With a method of manifold comparison we set the differences between breed, sex, and age groups. It is clear from the results that the statistical decisive is the difference among the breed, where the highest value of PPB (5.0007) is reached by group D100 (the offspring of Hannoverian horse parents), the biggest group among the breed (27.02%) is H50 (one of the parents is the Holstein horse). In evaluating the difference between the sexes the highest PPB value is present in stallions (4.0120) and the biggest group are the mares (47.72%). In looking at the differences among the age groups of horses the highest PPB (3.8530) is present in group 5 (eight years old) and the most represented group in the competition (17.53) is group 7 (ten to thirteen years old horses).

Key words: horses, the Hannoverian horse, the Holstein horse, the Westphalian horse, the Oldenburg horse, German warmblood, the Czech Warmblood, jumping performance

EFFECT OF LEGUMES IN BROILER'S DIETS ON SENSORY QUALITY OF MEAT

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Abstract: The aim of our study was sensory analysis of chicken meat from broilers fed mixtures with two different cultivars of peas *(Pisum sativum L.)* and horsebean *(Vicia faba L.)*. The second aim was to evaluate if different content of antinutritive factors had effect on presence of unpleasant odour or taste in breast and thigh meat.

The experiment was performed with 500 broilers of Cobb 500 hybrid combination. They were divided into five groups per 100 pieces. Feed mixtures contained 13 % of two cultivars of peas and 10 % of two cultivars of horsebean. Control group had 0.5 % of each cultivar. We chose two cultivars of peas and horsebean, which are very different in antinutritive factors levels. We chose peas cultivar ZEKON with low content of trypsin inhibitor (TIA, 5.47 mg/g) and peas cultivar GOTIK with high content of TIA (14.38 mg/g). The cultivars of horsebean we chose MISTRAL with low content of tannins (0.06 %) and MERKUR with high content of tannins (1.72 %). The 100 mm unstructured line scales were used for sensory evaluation. Sensory panel consisting of eight persons. Sensory analysis were carried out in three sessions.

In breast meat were all descriptors, except tenderness, evaluated better in control group than other groups. The highest differences were in odour and taste. Differences were not statistically significant. In thigh meat are results similar, the best evaluation had chicken meat from control group. Differences were not statistically significant too.

It can be concluded that feeding of peas in levels until 13 % and faba bean until 10 % has no significant effect on sensory quality of breast and thigh meat. We can safely use peas cultivars Zekon and Gotik and horsebean cultivars Merkur and Mistral in broiler's diets.

Key words: broiler, chicken, peas, horsebean, legumes, sensory quality

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THE UTILIZATION OF CORN DDG INTENDED FOR CARP (*CYPRINUS CARPIO L.*) DIETS

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Abstract: Effect of 0, 15 and 30% of corn DDG supplement to the diets (32% protein, 7.5% fat) for common carp (*Cyprinus carpio l.)* was investigated. The experimental feed were served three times a day (8.00, 13.00 and 18.00) to two year old carps for 42 days at daily feeding rate 3% of actually fish mass. The experiment was realized in three glass basin (200l) that were attached to recirculation system and air pump. The water temperature was 21.3 – 22.1ºC, oxygen saturation 54 - 97% and pH value 7.37 – 7.84 during whole experiment. The main investigated parameters were body proportions, individual weight increment, specific growth rate (SGR), Fultons and Clarks condition coefficient and food conversion ratio (FCR).

The values of body proportion, individual weight and conditions coefficients did not changed significantly by influence of different content of DDG. The highest values of growth rate was achieved by feeding diet with 15% of DDG (SGR=1.20 $\%.d^{-1}$). The variant with 30% of DDG in diet achieved worse value of this parameter (SGR=1.14 $\%.d^{-1}$) slightly. The lowest value of SGR achieved variant without corn DDG addition (0.97 $\%.d^{-1}$). The values of SGR and individual weight increase were not different among experimental groups significantly. The same trend of results like a SGR values was found out by feed conversion (FCR) values. The best conversion ratio value was achieved in the group DDG 15 (FCR = 2.35), the second group was DDG 30 (FCR=1.45) and the worst values of this parameter was searched for DDG 0 group. The corn dry distillery grains could by added to common carps feeds to 30% of content. The best production result was investigated in feed variant with 15% of corn DDG addition.

Key words: growth, food conversion, stock fish

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CONDUCTIVITY OF THE STALLION EJAKULATE

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Abstract: The aim of our experiment was to find relation between the conductivity of the ejaculateand the qualitative parameters of the ejaculate. The investigations involved 10 clinically healthy stallions. During the four consecutive weeks of ejaculate collections the quantitative parameters and conductivity were determined. The obtained values of qualitative sperm indicators their electric properties were interpreted by statistical methods (x, sx, min. max.). The differences between two means were tested by the t-test. The closeness of the correlations between the respective indicators of ejaculate quality and their conductivity were interpreted by means of the calculated phenotype correlations. Calculations of phenotype correlations didn't reveal any statistically significant correlations between the conductivity of the stallion ejaculate and qualitative parameters.

Key words: stallion, ejaculate, conductivity

THE CHANGES OF MUSCLE FIBRES DIAMETER OF BULLS DEPENDING ON THE DIFFERENT FACTORS

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Abstract: The objective of this work was to find out the changes in diameter of muscle fibres of bulls depending on different factors (age at slaughter, weight at slaughter and commercial type). To the analysis 5 breeds were included: Czech red pied bulls and his crossbreeds with the specialized meat breeds, further crossbreeds of hybrid bulls. A group of 85 animals was tested. For the analysis a pattern of musculus longissimus lumborum et thoracis was tested. This pattern was grained between the 9th and 10th dorsal vertebra. The patterns were measured by the modified software of firm LEICA used in microelectronics.

Results of our work show, that age at slaughter influences diametr of muscle fibres. Their diameter grows with the age. We found out that the depth muscle fibres was 37.51 ± 3.06 μm at the age at slaughter to 530 days, while at the age more than 541 days we measured mean value 39.41 ± 3.27 μm. Diameter of fibres is influenced even by the animal weight at slaughter. It is valid that animals have stronger muscle fibres when they have higher weight at slaughter. We noticed value 37.02 ± 2.13 μm at the slaughter weight to 555 kg, at weight over 621 kg it was already 39.67 ± 3.31 μm. The last factor which influences mean depth muscle fibres, that we dealt with, was commercial type. The depth muscle fibres at each type is different. The strongest fibres we measured at the crossbreeds of hybrid bulls (42.36 ± 3.40 μm), on the contrary the thinnest fibres had the bulls of Simmental (36.91 ± 2.64 μm).

The meat with thinner muscle fibres is finer, what we can distinguish when we appriciate the quality of meat. Our work show, that stated demand of the consumers we can influence by the choice of age and weight at slaughter of bulls.

Key words: bulls, diameter of muscle fibres, weight at slaughter, commercial type

THE QUALITY OF SILAGE AND TOTAL MIXED RATIO

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Abstract: Our objective was to evaluate a quality of the silage at the agricultural plant. The quality of the total mixed ration was monitored and nutrient content was compared with nutrient requirements of a dairy. Maize silage, alfaalfa silage, "CCM" and sugar beet pulp silage were made. The samples of the silage were taken and analysed. Every silages had excellent quality, however the maize and alfaalfa silage had high acidity. The nutrient content did not respond to requirements of a diary. During the evaluation process of the total mixed ration were discovered some differences in content of fiber, proteins and dry matter. It was due to different size of a particle of animal feed.

Key words: Maize, alfaalfa, silage, dry matter, protein, fiber, fermentation.

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STATISTIC ANALYSIS OF THE POPULATIONS OF AKHALTEKE HORSES ON THE BASIS OF BODY MEASUREMENTS IN CHOSEN COUTRIES

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Abstract: Our research object was to record and to measure as much as possible Akhalteke horses, which are bred in Czech Republic, Russia and Kazakhstan. We measured and recorded 3 basic body measures – Height at withers, chest girth and girth of cannon. The only condition we have was the age of horses determined on to 3.5 years and older. At the end we recorded 260 horses. We divided the values to the groups according to state, sex and age cathegory. We use the GLM method and Tukey-B test to evaluate the results. The results of the analyse of the Height at withers (HW) shew the statistically conclusively lower values of Czech horses than in horses from Russia and Kazakhstan. The average of the HW of Czech Akhalteke horses is 154.0385 cm, in comparison with Russia 157.94 cm and Kazakhstanu 156.53 cm. Next we found the statistically conclusive differencies of the values of the Girth of Chest (GCh) between Akhalteke horses from Russia (179.65 cm), Czech Akhalteke horses (177.08 cm) and horses from Kazakhstan (174.82 cm). Also the Akhalteke mares (180.06 cm) had the statistically conclusivelly higher the GCh than stallions (176.58 cm).

Key words: Akhalteke horses, body measures, breed standard

Acknowledgments: This study was supported by the Research plan No. MSM6215648905 "Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change", which is financed by the Ministry of Education, Youth and Sports of the Czech Republic and IGA 280191.

EVALUATION OF INFLUANCE OF WEIGHT OF PIGLETS DURING THE WEANING ON THEIR WEIGHT GAIN AND FEED CONVERSION IN COMPARISON OF TWO FEEDING MIXTURES.

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Abstract: The aim of this work was the evaluation of influance of initial weight of piglets during the weaning on their growth in comparison of two feeding mixtures. In experiment were chosen 80 piglets, which were scaled and then separated into special, separated sections. Piglets were fed by feeding mixture ČOS for 18 days and then they were scaled again. Out of this group were chosen 50 piglets with similar weight and they were weighted again. These 50 piglets were separated into two groups. In each group there were given 25 piglets. In each group piglets were fed by different feeding mixture. Feeding mixture A1 no.1 was made in own manufactory, second mixture A1 no.2 was bought from a trading company. Feeding mixtures were bought in the amount of 1000kg and the experiment was finished at the time when one mixture was consumed. The experiment was carried out for 30 days. Growth gain and feed conversion were observed. Better results achieved group were feed mixture A1 no.2. Fully it was fed 835 kg of the second mixture, total growth gain of the whole group came to 434.5 kg, feed conversion equated 1.92 kg per kg of weight gain and an average weight gain was 580 g per day. It was fed 1000 kg of the first mixture. So the whole amount was fed. Total growth gain of the whole group came to 400.0 kg, feed conversion equated 2.5 kg per kg of weight gain and an average weight gain was 537 g.

Key words: feeding mixture, weight gain, feed conversion, piglet

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THE EVALUATION OF CRITERIA OF YOUNG HORSES OF SPORT HORSES IN CZECH REPUBLIC

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Abstract: The aim of this study is to evaluate the results of breeding competition and work up a judgment of pedigree values. The breeding competitions are holded for four to six years old stallions and mares. The horses are evaluated by commisar. They have three marks for evaluation for jump, dexterity and readiness of horse. The horses are evaluated according to ten-point scale from 0 to 10. The general evaluation is sum total of these three marks. The commisar must take off negative point devide two from these three marks. There are compared some factors as sex, age, degree of difficultness, place and the date of compatition, commisar and rider. The results are obtained from the Czech eqeuestrian federation.

The evaluated results are from the period of 1998 – 2007. We compared the factors of sex, country of origin of the horse, age, examiner, level of difficulty of the competition and year of the venue. In these competitions 1617 horses started. The results were evaluated using analysis of variance and subsequent tests. Statistically significant differences were detected for all the evaluated factors. In terms of the sex factor the evaluation of the stallions was highly significantly ($P<0.00$) higher than the mares. Comparisons of the country of origin revealed that the evaluation of imported horses was highly significantly ($P<0.00$) better than of horses of Czech breeders. When comparing the age we discovered that the rating of six and five-year-old horses was statistically significantly ($P<0.00$) higher than of the four-year-old horses. This factor is connected with the level of difficulty of the competition. Evaluations in the higher levels of difficulty were statistically highly significantly ($P<0.00$) better than in the lower levels of difficulty. Comparisons of the factor of the year of the competition showed that the quality of the starting horses is increasing.

Key words: breeding competition, czech warmblood horse, judgment of pedigree values

FOURIER ANYLYSIS AS A TOOL FOR DESCRIPTION OF STALLION SPERM HEAD SHAPE VARIABILITY

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Abstract: Variability of stallion sperm head shape was quantified by use of elliptic Fourier descriptors. The image analysis software Shape was used for determination of closed contours of the sperm heads (obtained through binary images with appropriate thresholds) and chain–code description. Following parameters were considered: length to width ratio, position of the center of gravity, curvature, and degree of roundness. The scores of the components were used in subsequent analysis as sperm head shape characteristic. Inverse Fourier transformation was used for visualisation of shape variation and influence of individual components. The first four principal components provide a good summary of the data, accounting for almost 90 % of the total variance. Dominant importance and relevance of length to width ratio (with contribution of 50.73 % to the total variance) as a determining parameter of sperm head shape was quantitatively confirmed.

Key words: image analysis, sperm head, Fourier descriptors

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INFLUENCE OF FEEDING OF NATURALLY MOULDED DIET ON LEVEL OF HEPATIC ENZYMES

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Abstract: In 28-days experiment we tested effect of naturally moulded diets on level of hepatic enzymes and on performance of Wistar albino rats. For this experiment were used four level naturally mouldy wheat – 0, 33, 66 and 100 %. This experiment was conducted to determine influence of moulded wheat in experimental mixtures on health condition, growth performance and feed conversion of rats.

For testing were used selected male laboratory rats of Wistar Albino strain at age of 28 days. These were divided in four groups with seven rats each and passed plastic cages with slotted floor in vivarium. All rats were marked by zootechnical colour which make possible to individual monitoring and weighing. At the very end the animals were putted to death and blood were sampled. Alkaline phosphatase (ALP) and aspartate transaminase (AST) level was determined by differential biochemical analyses.

The results of our experiment showed us, that weight of rats weren´t significant differences between groups. Control group had the highest average weight gain from 1st till 28th day, which was 227.91 ± 22.24 g. The group fed mixture with 100 % mouldy wheat had the worst weight gain, which was 186.46 g. We found out that the control group had the best feed conversion, which was 2.7 and the worst feed conversion had the group fed mixture with 100 % mouldy wheat and it was 3.24.

The results of biochemical analyses showed us, that level of hepatic enzymes from 1st till 28th day about control group it was 255.83 ± 57.61 U/I for ALP and 111.68 ± 69.23 U/I for AST. The group fed mixture with 33% mouldy wheat had the worst level of hepatic enzymes which was 278.25 ± 103.85 U/I for ALP. The group fed mixture with 100 % mouldy wheat had the level of AST which was 290.33 ± 78.47 U/I.

Key words: hepatic enzymes, growth performance, aspartate transaminase, alkaline phosphatase

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THE INFLUENCE OF CHELATES ON SELECTED BLOOD PARAMETERS OF HORSES

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Abstract: The effect of microelements chelates supplementation (Zn, Mn) on blood parameters of horses was evaluated (number of erythrocytes and leukocytes, level of Cu and Fe in blood plasma). Six clinically healthy horses of University farm Zabcice were in the experiment. The level of blood parameters were compared in blood samples taken before and after experimental period. Before experimental period the horses were fed by standard mineral premix and during experimental period of 28 day they were fed by premix with chelates of Zn and Mn. The average hay intake was 10.37 kg of dry matter per horse and day. The average intake of concentrates was 2.87 kg of dry matter per horse and day. We could see the improving of erythrocytes number in blood (8.23 compared with 8.16 10^6/mm3), lymphocytes (7.60 compared with 7.15 10^3/mm^3). The other monitored parameters were Cu content in blood plasma (15.18 respectively 16.00 µmol/l) and ferrum content (24.67 versus 29.30 µmol/l). The statistically significant difference was found out in case of ferrum content. In other part of experiment we evaluate the linseed supplementation on these parameters. – No significant differences were found out.

Key words: horse, chelate, minerals, zinc, manganese, blood, plasma, iron, copper

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REACTION OF HIGHER PRODUCTING COWS ON SUMMER TEMPERATURES IN THE STABLE

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Abstract: Aim of this study was to evaluate from what range of temperature, relative humidity and THI will decrease milk production of high–producing Holstein cows on 2nd and higher lactation. Cows were placed on university farm in Zabcice (CZ) lies in lowland area (49°0'4"North, 16°36'East, 179 m of altitude). Cows were stabled together in same conditions in loose housing stable with bedding. As microclimatic factors were monitored air temperature –T (ºC), relative humidity –RH (%) and counted temperature–humidity index – THI. The experiment was carried out from June to August (2007). There were recorded 12 summers and 1 tropical day in the stable. RH varied from 40 to 80 %, and THI were 18 days above 72.

We have found that higher temperatures and THI in stable have negative impact on milk production. As a critical we have found temperature 22 °C of cows on 2nd lactation and 25 °C of cows on higher lactation. Critical THI value was 69 of cows on 2nd lactation and 73 of cows on higher lactation. We haven't found exact influence of relative humidity in stable on milk production.

Key words: milk yield, summer temperature, relative humidity, THI

Acknowledgments: This study was supported by the Research plan No. MSM6215648905 "Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change", which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

Section – Agroecology

RESEARCH OF POSSIBILITIES OF UTILIZATION OF SELECTED SORTS OF COMMUNAL WASTES FOCUSED ON WASTE TIRES

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Abstract: The worldwide production of waste tires (so called "end of life tires" - ELT) grows every year. The same situation is in the Czech Republic and in the countries of the European Union. The composition and energy characterictics of tires are a significant source of material, energy and also raw material. An assessment of tires´ life cycle and other products and activities is an important information instrument of environmental policy. It is an voluntary instrument.

The life cycle assessment (LCA) is system analysis focused on appraisal of possible environmental impacts of products or services in their entire life cycle. A description of particular phasis of tires´ life cycle and their influence on environment is the main aim of the research. The phasis of life cycle of tires are: a raw material extraction, production of materials, transport of raw material, production of tires, transport - distribution, use of tires, transport of used up tires, retreading, disposal with ELT.

There are a few possibilities how the tires can be safely and effectively utilized even after ending of first part of their life cycle. The aim of the research is focused on the second part of product life cycle - the tire at the end of lifetime. The main possibilities of utilization of used up tires after end of their life are as follows: retreading, recycling (production of granulate), energy and material utilization in a cement factory, pyrolysis (production of pyrolytic products) and formerly used waste storing. Another aim is to determine enviromental impacts in the particular phasis of life cycle of waste tire.

Key words: tire, life cycle, waste, recycling, LCA, environmental impact.

THE PEDOCOMPACTION OF TOPSOIL AND SUBSOIL ON CHOSEN LOCALITIES

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Abstract: Pedocompaction is known as one of the types of soil physical degradation. It causes crucial disturbances of biological activity in soil as well as of physical properties (like porosity, permeability, structure etc.).

The pedocompaction can occur in topsoil as well as in subsoil at anually ploughed land. The pedocompaction is a type of soil degradation with cumulative character and eventually the hardened layer forms. This layer is caused by the heavy mechanics traversing. This layer is impermeable for plant roots as well as for water and oxygen so the soil functions are reduced.

The survey proceeded at the localities in the suroundings of Lysice municipality. 38 measurements proceeded on total area of 174 ha (1 measurement per 5 ha on the average). The pedocompaction was measured down the depth 60 cm, while two layers were surveyed – topsoil (0–30 cm) and subsoil (30–60 cm).

Key words: soil degradation, pedocompaction, Bohemian and Moravian higland

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GROWTH PERFOMANCE AFTER 1ST COPPICING ON FAST GROWING WOODY PLANTS

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Abstract: Fast-growing woody plants serve as a potential source of renewable energy. In order to research a utilisabibility of these woody plants there was established a high density experimental field plantation including a range of available clones of *Populus sp.* and *Salix sp.* with total area of 1.5 ha in early 2001 in Domanínek (Czech Republic, 49°32´ N, 16°15´E and altitude 530 m). The clone experiment included 6 clones of *Populus* and 6 clones of *Salix* allowing 4-replicate experiment. The plantation was established on agricultural land and planted in a double row design with a density of 10,000 trees/ha. The trial was weeded by mechanical methods, and no irrigation, fertilization, or herbicides were applied. The experiment was harvested at the end of 2006.

In spring 2008, after 1st coppicing, it was determined, how many shoots clones of selected sorts created. It was found, that *Salix sp.* performed higher number of shoots, particularly the SVIM – 519, resp. VIMINALIS clone. The lowest number of shoots was observed by *Populus sp.*, namely the J 105 clone. All differences among sorts and clones were highly significant. Further, there is a hypothesis to approve, that number of shoots directly relates with yield of these woody plants. A theoretical correlation is negative, i.e. *Populus sp*. performing high yields, but relatively low number of shoots in comparison with *Salix sp*. Main factors to observe in the future are the same as studied: climate conditions, soil characteristic and a competition with weeds in a field.

Key words: fast growing woody plants, populus, salix, shoots

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MONITORING OF WATER POLLUTION OF ŽELEČSKÝ STREAM UNDER ŽELEČ VILLAGE

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Abstract: Paper deals with water quality monitoring of Želečský potok in Prostějov´s village Želeč. Into that stream was lead waste water from the village. There is an accumulative reservoir about 25 km down the village, which is planned to be used for recreation, especially for swimming. Based on yearly monitoring and water samples from 5 profiles there are collected information about water quality thought the whole stream. One profile is located in the reservoir. Evaluation of the reservoir feasibility for the mentioned purposes will be undertaken after measurement is finished. Subsequently there will be also done a proposal how to clean the waste water in the village.

Key words: water quality, profile, waste water, recreation

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WETLAND PLANTS AND THEIR USAGE IN CONSTRUCTED WETLANDS

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Abstract: The use of Constructed Wetlands to treat wastewater is a rapidly emerging as a viable alternative to common treatment facilities. They can be used for treatment of wastewater produced in households, citizen buildings, smaller villages, and for secondary treatment after primary treatment (mechanical or chemical). Treatment processes are similar to natural environment self-treatment processes. For treatment purposes in constructed wetland can be used a variety of wetland plants. In European condition the most used are Schoenoplectus lacustris, Phragmites australis and Typha latifolia. Constructed wetland systems offer several potential advantages as a wastewater treatment process. These advantages include simple operation and maintenance, process stability under varying environmental conditions, lower construction and operating costs. The study deals with the performance of the constructed wetland and also the effectiveness of plant species.

Key words: constructed wetland, wetland plants, bulrush, reed, cattail, Schoenoplectus lacustris, Phragmites australis, Typha latifolia, effectivity of constructed wetland

Acknowledgments: This study was supported by the VEGA 1/0702/08.

EROSION MODEL IN THE WIND EROSION PREDICTION SYSTEM

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Abstract: Wind erosion is a serious problem on agricultural lands throughout the Slovakia as well as the world. The ability to accurately predict soil loss by wind is essential for, among other things, conservation planning, natural resource inventories, and reducing air pollution from wind blown sources. The wind erosion prediction system is designed to simulate soil loss by wind from cultivated fields by simulating weather and field conditions (Wagner, 1997). WEPS is process / based, continuous, daily time step model that simulates weather, field conditions and erosion by wind. It has the capability of simulating spatial and temporal variability of a field´s soil, crop, and residue conditions and soil loss/deposition within a field. The objective of this work was to description of EROSION submodel, which simulates the components of soil loss/deposition over a rectangular field in response to wind speed, wind direction, field orientation, and surface conditions, on a sub / hourly basis. The erosion submodel calculates total, suspension, and PM – 10 soil loss/deposition at each grid cell in the field. The grid cell data are summarized in other parts of WEPS and reported to users as averages over the field for selected periods. There latter outputs are useful for evaluating off-site impacts in any given direction from the eroding field. The work is the extract of the User manual for WEPS 1.0 published by USDA-ARS Wind Erosion Research Unit, Manhattan Kansas, USA, February 2008.

Key words: wind erosion, wind erosion prediction system, erosion model

Acknowledgments: This study was supported by the VEGA 1/4412/07 and 1/4404/07

THE STUDY OF OPERATIONAL, TECHNOLOGICAL AND URBANISTIC FARM CONCEPTION IN ORGANIC FARMING

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Abstract: This research work focuses on the study of optimized farm conception in conditions of organic farming. Solved conception is fit mainly for submontane and mountains areas, because model farm is situated in submontane region. There is realized analyses of current conditions in the area and design of variants. In the study are designed basic operational, technological and urbanistic solutions of farm conception. There are designed three different variants of farm conception. There is important to find optimal environmentally positive solutions for farm operating, waste management, water management and maximal application of energy, building construction, materials and technology from renewable resources. The results of the study indicated individual characteristics of particular variants with their advantages, disadvantages and opportunities. Variants are mutually compared. The study is useful source of information for practical farm realization in conditions of organic farming. This study also includes the technical drawings and pictures.

Key words: farm, conception, buildings, construction, technology, organic farming, waste management, water management

PROPERTY LOSS CAUSED BY IMMISSIONS IN AGRICULTURAL PRODUCTION

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Abstract: The evaluation base for air quality is quantity of pollutants. These pollutants are called emissions and immissions. The air pollution has negative effect for living organism and breaks its natural functions. This is the reason why industrial production decreased yield of agricultural products. In Slovakia, this relation is recompensed as detriment since 1963. For quantification of property loss, it is important to know immission situation in the studied region, main economic characteristics of agricultural subjects and consequently to numerate the property loss. In 90-ties of 20th century Slovakia successfully broke the connection between growth of industry production and environment pollution. In spite of long-term improving environment of given locality, property loss caused by industrial pollution is still relevant and there is a need to quantify it.

Key words: immissions, property loss, agriculture

Acknowledgments: This study was supported by the VEGA 1/4426/07.

PERSPEKTIVES OF WEGETABLE WASTE COMPOSTING

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Abstract: The goal of this study was to gain knowledge about effect of compost from waste produced at vegetable-working facility, and mineral structure of grow on plants. Followed in relation to this subject, also exanimate effects of compost, mineral fertilizer and mycorhiza. The lettuce (Lactuca sativa) was grown as an experimental plant.

Results of nitrogen and phosphorus analyses in shoot biomass of lettuce in different variants, shows good assimilation of phosphorus in lettuce grown on soil with compost, or compost with mycorhized fungi. The highest content from the total amount of nitrogen substance was noticed at lettuce grown only on soil with mineral fertilizer adjunct.

It can be submitted, that composting of vegetal waste from vegetable-working facilities is very perspective and the produced compost presents quality fertilizer for plant cultivation.

Key words: compost, minerals, vegetable, plant, lettuce

THE LEVEL OF ORGANIC POLLUTION OF MIDDLE COURSE OF THE JIHLAVA RIVER ACCORDING TO SAPROBIC INDEX AND TROPHIC POTENTIAL

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Abstract: In the vegetation season during the year 2008, on the two locations middle course of the Jihlava River - above and below water reservoirs Dalešice and Mohelno, the samples of water and macrozoobenthos were taken for the assessment of the level of organic pollution and evaluation of importance of the water reservoirs impact on the level of organic pollution, at monthly intervals. The pollution was evaluated by the trophic potential and the saprobic index. The trophic potential from the samples of water, the saprobic index was determined from the macrozoobenthos samples.

On the Vladislav location, above the water reservoirs, the trophic potential was determined 220.16 ± 36.97 mg.l-1 it means the mezo-eutrophic class. The saprobic index was determined 2.19 ± 0.09 to β it means the mezosaprobic class. On the Biskoupky location, below the water reservoirs, the trophic potential was determined 213.5 ± 28.79.mg.l-1 it means mezo-eutrophic class. The saprobic index was determined 1.67 ± 0.18 to β it means mezosaprobic class.

Statistically decisive wasn't the difference of the trophic potential between the locations. Values of the saprobic index were statistically decisive lower on the Biskoupky locality than the values of the locality Vladislav.

Key words: water, pollution, river

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PROPERTIES OF A RE-EVALUATED AGRICULTURAL SOILS IN MORAVSKÝ PÍSEK LAND REGISTER

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Abstract: These work's goal is to specify and examinate four randomly selected localities and their soil properties. There are two example sets, first was taken from Complex Soil Exploration (KPP) (1963) and second set is my own (2008). Both were from Moravský Písek land register, where re-evaluation in 2004 was made. The main land user in this area is the agro-enterprise Svornost Těmice Inc. This thesis compares changes at topsoil and under-topsoil properties since 1963 (KPP) to 2004 (re-evaluation). Changes are expressed by bonitation codes (BPEJ) and supplied by my own laboratory analysis results. Biggest changes are apparently at granular constitution in topsoil and under-topsoil layer. I suppose that acidity wasn't analysed completely at KPP, because in all probes and strata was measured the same value. These soil feature changes were significant at re-evaluation localities in 2004, when locality V9 was excluded from ZPF, at V10 was code changed to BPEJ 07001, at V5 stayed BPEJ 02110 without changes and V6 was also changed to BPEJ 02110. My own analyses confirmed these changes and complemented it by particular measured data. Only at place V5, I suppose, BPEJ code change should be made, in consequence of large elements content changes.

Key words: soil properties, re-evaluation, BPEJ, evaluation

AMOUNT OF PROPERTY DAMAGE TO ANIMAL PRODUCTION CAUSED BY IMMISSIONS

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Abstract: Immission situation has changed during the last century. Level of emmission has dropped, and that is reflected on charging of environment with immisions. Although the immision level has dropped, property damage they do is still inconsiderable high. That is why it is necessary to concern at calculation of economic damage caused by immissions, but also correctness of used methodology of calculation.

Average values of utility of livestock near heat powerplant were used for solution of this work. Four species of animals were chosen: milkers (dairycow), young cattle, beef cattle and vealers. Calculation of economic damage caused by immissions is done in accordance to methodology of valuation of restitution of economic damage caused by immissions in agricultural production created by Němec (1992). Two calculations were done. First one was done for livestock exposed to immisions, second one was done for livestock exposed to immisions and affected by contaminated food.

Total value of economic damage for livestock exposed to immisions in long time perion in first degree of pollution is almost 3034500,- Sk. Evaluation of calculationfor livestock exposed to immisions in long time perion and affected by contaminated food in first degree of pollution is almost 2691500,- Sk.

These calculations were theoretical and in them we contemplated that concentrations of immissions don`t occur in that range as they are included to cathegories.

That is why we want to notice that in low concentrations (lower than 40 $\mu g.m^{-3}$) are caused economic damage of utility of livestock.

Key words: economic damage, utility of livestock, damage caused by immissions, immision concentrations, utility dropping

Acknowledgments: This study was supported by the VEGA 1/4426/07 Assessment of dust concentrations of air pollution by damaging of agricultural crops

INTERESTS OF DEVELOPMENT OF RURAL REGIONS IN MORAVIAN - SLOVAK BORDER (FOR INSTANCE OF MICRO – REGION KAROLINKA)

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Abstract: To gain and evaluate available data of micro-region and particular sites – Halenkov, Nový Hrozenkov, Karolinka and Velké Karlovice was the aim of this work. Several sociologic methods were used to obtain particular information – questionnaires, interviews, the SWOT analysis and the literature review as well. The micro-region under study is situated in border part of the Czech Republic as well as in PLA Beskydy. This is the reason why there are some restrictions here. On the other hand, the fact described above is positive for the development of this area. Mayors of the regions are obviously aware of this fact. They consider supporting tourism as the main factor for permanently sustainable growth. Many people, who live in micro-region Karolinka, would like to see development of infrastructure, culture and sports, which, in their opinion, can help to the tourism too. The SWOT analysis leads to the same conclusion – to support tourism. To support tourism is neither cheap nor easy. Therefore, it is necessary for the communes in the micro-region Karolinka to cooperate with each other. This would help to create close unit, which would offer complete upcountry for all year tourism.

Key words: microregion, development, border, nature, cooperate

TITTLE: REGISTRATION OF SIGNIFICANT TREES IN STŘITEŽ NAD LUDINOU

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Abstract: Article presents results reached in frame of registration of significant trees in the village Střítež nad Ludinou project. Register was elaborated for municipality Střítež nad Ludinou. Goals of the project were to choose the most significant trees, to locate them, measure and evaluate their vitality, health and stability. The second important task of the project was elaboration of the significant trees valuation method proposal.

Article includes text, maps, database and card index. Text contents methodology and characteristics of the survey area. There are registered trees in the maps, the database includes data of trees and in the card index there are data and photos of trees in winter and in growing season. The register serves as summary of significant trees and as basis of management.

Key words: significant tree, registration of significant trees, Střítež nad Ludinou

ANALYSIS OF VOLUNTARY ENVIRONMENTAL POLICY IN AGRICULTURE

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Abstract: The analysis of benefits of environmental management systems is the right part of applying environmental policy in Slovakia. Object of work is develop problems of environmental management systems implementation in sector of agriculture. We realize that the common but often used Deming's model is again the best way of application in organization of this type.

Implementation was universalized to these constituent parts:

- Analysis of environmental situation
- Assessment
- Planning
- Implementation and performance
- Inspection
- Certifying SEM

Assessment is focused in regulation and organization level and state of authorities in organization, including dates about qualificated growing and education of employees in the course of study. And if you focus in assess of economic indicators in connection with the environment, we can guarantee the success. The same applies, when you analyze the used, prevent and repressive economic instruments, which are sometimes spring of assets, sometimes spring of liabilities in organization.

Key words: impact, aspect, environment, policy

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POSSIBILITIES OF APPLICATION OF BIOINDICATORS AT KLATOVY - ŠTĚPÁNOVICE LANDFILL

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Abstract: The study "Possibilities of application of bioindicators at Klatovy – Štěpánovice landfill" is focused on examination and determination of bioindicators, mainly phytoindicators. From their existence, condition or behaviour judgements might be carried out on existence of specific environmental indicators and on environmental condition and changes. The goal of this study is to examine the conditions of ecological load (forest and meadow ecosystems) of Klatovy – Štěpánovice landfill.

Key words: phytoindicators, landfill, waste, bioindicators.

Section – Techniques and Technology

POSSIBILITIES OF ULTRASOUND AND PRESSURE SENSORS USAGE FOR FLOW RATE MEASUREMENT OF SMALL FOREST STREAMS – DEFINITION OF USAGE LIMITS

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Abstract: One of the main goals of water management measurements in river (stream) basins is ralisation of measurements with minimal influence to ecosystem relationships or relationships within the ecosystems. Realisation of described measurements is possible only in case of having accurete data measured on concrete site. Accuracy and long-termination of measured data are the presumption of carefully and appropriate realisation of water management measurements with minimal negative impact to environment. In case of torrent and water management constructions building on small forest streams is necessary to know accurate values of flow rate for correct dimensioning of mentioned construction. Over-dimensed torrent and water management constructions may have negative influence to water ecosystems and also economic aspects of those constructions may not be generally acceptable.

Given article presents method and the first results of flow rate measurement on small forest stream in University Forest Enterprise Masaryk Forest Křtiny area. The method of usage of ultrasound and pressure sensors imlemented to condition of small forest stream by using Thompson spillway panels was applied for presented results obtaining.

Key words: flow rate measurement, ultrasound sensor, pressure sensor, small forest stream

IMPLEMENTING SPC IN INDUSTRIAL PROCESS

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Abstract: The article is engaged in implementing of statistical process control on machines into the mechanic production, therefore in suggestion of suitable statistical instruments for the operating of the processes. In this article is tried to find a solution to the statistical stability of the processes, their regulation and the improvement. One part of the article deals with the statistically gained data evaluation and the correctional precautions at the demonstration of the process' instability. As a result is implementing measuring station from where will be the process data transferred to a server, where will became to data evaluation. If is all system correctly installed, the reason is production costs reduction owing to scrap reduction.

Key words: statistical process control, SPC, quality improvement, stability, qualification, control charts, quality control.

THE USING OF GEOGRAPHICAL INFORMATION SYSTEMS IN WRECKED CARS TREATMENT

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Abstract: The number of new cars produced in Czech republic and the number of worn-out cars imported to Czech republic is increasing. In connection with this the ammount of service life ending cars is increasing too. This fact in conjunction with the deficient legal enactments for their effective processing means a big environmental problem.

The legal enactments which direct all processes about wrecked cars treatment appear from European guide no. 2000/53/ES. The main law in Czech republic is waste testament no. 185/2001 including its processing norms.

The building of information system of service life ending cars is very important to granting of complex information about waste flow by processing of wrecked cars or location of places with its treatment. But this system cannot be used for displaying geographical data, for example location of processer of wrecked cars right on map, which it can be very good information for people when they must disposal wrecked car with respect for environment as it is assigned by the waste testament.

Wherefore the other possibility is using of geographic information systems for building information system includes graphic information in term of maps including positions of processor of wrecked cars and more other information. This project may be included in the websites of state administration bodies by the equivalent software moduls. It is possible to use the project (or the system) in quite a number of administrative and planning activities as well as for giving information to people as it is noted above.

Key words: wrecked-car, information systeem, waste flow

TEMPERATURE MEASUREMENT BY MEANS MODERN AUTOMATIZATION

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Abstract: This article is conversant problems temperature measurement by various methods, their use in practice, processing measured values and interpretation. Is noted several example measurement contacts end infrared method, their outputs may be number data end picture type. As a result is improving technological process, detection problems and defect.

Key words: temperature, measurement, infrared camera

APLICATION FIELD NANOTEXTILES IN AGRICULTURE

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Abstract: The entry deals with the question of how to utilize nanotextiles in the agriculture. It outlines possible fields where nanotextile materials could be used in packing technology, plant medicine and technical filtration. It describes the testing of fungi throughput through a layer of nanotextile, carried out in the cooperation with TZU in Brno. The testing led off from the norm ČSN EN ISO 846. Two types of materials were tested – nanotextile Chitosan with PEO (93,6%) on matrix PP, and PA612 on matrix viscose. The assumption of food protection against the fungi spore activity by nanotextiles was not proved at contact protections. Recently, possible modifications of the layer, preventing the mould spores throughput, are considered.

Key words: nanotextiles, fungi

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THE COMPARISON OF DRAWBAR PERFORMANCE OF TRACTORS WITH DIFFERENT CHASSIS CONSTRUCTION

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Abstract: A purpose of crosscountry measurement was find out an influence of different tractor support frame construction solution on drawbar characteristics. The crucial comparative characteristic was drawbar force, drawbar power, slippage and drawbar consumption. To reach comparative output was necessary apply machines with the same characteristics influencing rates of wanted values. The most important is total weight of the tractor and engine power. This is the reason why were used tractors Challenger. First with tracked chassis type MT875B and second with wheel-chassis type MT975B. For getting data was employed own tractors network CAN-Bus, tensiometer sensor HBM Z4, radar RDS TGSS model SR168-6-010 and sensor of wheel speed from LARM Company. Measurement was on the surface with continuing grass growth and on concrete. Measured traktor was braked with two other tractors on positive drawbar force value. During transit in measurement section were all surveyed values continually recorded and for every surveyed speed were measured several points, which were put into graph. The other values were counted and it was put together drawbar characteristics. From measurement answers was sure the wheel tractor with dual tires extended on concrete surface better drawbar forces then the tracked tractor. On the grass surface it was reversely. In confrontation of drawbar powers was better in either cases the wheel tractor.

Key words: tractor, drawbar performance, drawbar pull, drawbar power, slip, chassis

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MONITORING PROCESS OF BIOMATHANIZATION

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Abstract: A methodology of the essential biogas analysis and of substances which are entering this process is presented in this paper. The aim is to demonstrate running and grading gas quality and quantity stabilisation on a small model. Researched materials are farm wastes, containing various adulterans and samples from different functional parts of the biogas station. The basic monitored assesment is quantity and quality of the gas, content of organic acids and dry matter. The process of biogas creation has been successfully demonstrated, the biological activity and stability of the sample has been determined and effectively compared, eventually optimalized, the process of combustion of dissimilar matters.

Key words: Biogas, biomathanization, process of biogas creation

MATHEMATICAL MODEL OF THE HAY AGGREGATOR FELLA TS 1602

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Abstract: The work presents construction of mathematical model of the hay aggregator. Analytical modell is based on the programme Maple 11 and enables evaluation of the influence of the dimensions of constructional parts on the kinematics and dynamics of the whole machine. This approach enables creation of precise animations showing movement of the key constructional parts, computation and drawing of precise graphical dependencies showing dynamic stress or consumption of energy. Study of the modell enables detection of the constructional imperfections and demonstrates possibility of improvements.

Key words: Maple 11, mathematical modelling, analytical description, animation, contruction, quality evaluation

Acknowledgments: Authors would like to express thier gratful thanks to the company TOKO-AGRO a.s. Rudice u Luhačovic for kind lending of the constructional parts of the hay aggregator.

CORROSION OF AUSTENITIC STEELS

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Abstract: The article is engaged in corroding process of stainless steel which are applied to processing industry. Work of basic research was engaged in milk contamination hazard in pasteurization column. During this problem solving was found out the pipeline degradation which exhaust or brings the milk to pasteurization column. Running down of corrosive products was found in locations which are not only forming deformated but also is occured here the welds. Deformation passage and thermal cycles represent activation of sensitation stainless steel. Next unknown is activity of wash out and desinfection means which are used for antibacterial treatment of internal pasteurization column quarter.

Key words: corrosion, austenitic steel, food industry

Acknowledgments: This study was supported by the Research plan No. MSM6215648905 "Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change", which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

ESTIMATION SEASONAL EFFICIENCY PICKING THRESHING - MACHINES AND ECONOMY RUNNIG

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Abstract: The parameters of the harvesters were examined by the operation in the service trades. I determined some facto. The raviability of the measuving valves of the harvesters is influenud by technical and functional implications and also by human agents.

Key words: harvesters, parameters, fuel consumption

Section – Food Technology

DETECTION AND MONITORING OF PROBIOTIC MICROORGANISMS IN FERMENTED MILK PRODUCTS

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Abstract: Probiotics are defined as live microorganisms present at food which have a positive effect on structure of intestinal microflora and thus also for men's health. These days, we can see on market mainly fermented milk products with addition of these microorganisms, especially containing strains of the genus *Lactobacillus* and *Bifidobacterium*. For reaching positive effect on men's health, it is suggested to consume at least 100 grams of fermented milk products with minimal concentration of 10^6 CFU/g of probiotics daily.

Five kinds of fermented milk products REVITAL ACTIVE with different flavour (natur, aloe vera, strawberry, raspberry – vanilla, apricot) were analyzed for quality and quantity level of probiotics at the day of production and during the whole expiration period (28 days). The producer of these products is guaranting presence of three probiotics strains: *L. acidophilus*, *L. rhamnosus* and *Bifidobacterium sp.*

The presence of those three species were proved at each of tested products during the whole expiration period in total amount greater than 10^6 CFU/g.

Key words: Lactobacillus acidophilus, Lactobacillus rhamnosus, Bifidobacterium sp., probiotic bacteria

SOME MICROORGANISMS FORMING BIOGENIC AMINES IN DUTCH-TYPE SEMI-HARD CHEESE

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Abstract: Counts of lactic acid bacteria (LAB), total anaerobes and enterococci were determined in the course of ripening in the edge part (E) and the core part (C) of Dutch-type semi-hard cheese produced with different fat content (30 and 45 %) by two different producers (H and R) using two different starter cultures (L and Y). Counts of LAB at the beginning of ripening (day 0) in H producer´s samples were higher ($P<0,01$) in comparison with the R producer´s ones. Count of enterococci was the highest ($P<0,05$) at the end of the ripening (176^{th} day) in sample R30YE. Higher ($P<0,01$) enterococci counts were in R producer´s cheeses (in comparison with the H producer´s ones). Enterococci contamination was higher ($P<0,05$) in E-samples than C-samples. Content of the sum of all BA in cheese was negatively correlated ($P<0,05$) with counts of lactic acid bacteria ($r = -0,24$) and counts of total anaerobes ($r = -0,23$). No correlation between the sum of BA content and enterococci counts was found.

Key words: biogenic amines, cheese, enterococci, lactic acid bacteria, total anaerobic microorganisms

PROBIOTIC CULTURES IN DRY FERMENTED SAUSAGES AND THEIR INFLUENCE ON THE CONTENT OF BIOGENIC AMINES

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Abstract: The aim of this work was to study the effect of probiotic bacteria *L. casei* on the content biogenic amines in dry fermented sausages „Paprikáš“ taken from two different producers. Probiotic bacteria *L. casei* was combined with starter cultures (*Staphylococcus carnosus* and *Lactobacillus curvatus*). To monitor the biogenic amines tyramine, histamine, putrescine and cadaverine, HPLC method with UV detection was used. The content of biogenic amines was monitored during fermentation (0-28 days) and storage (28-49) of fermented sausages. In both producers, the numbers of *L. casei* reached 10^4 CFU/g during the fermentation (0-28) and they remained relatively constant during the storage (28-49). We also observed the total numbers of LAB, which reached 10^7-10^8 CFU/g during the first 14 days of the fermentation and then were about 10^6-10^7 CFU/g during the rest of the fermentation and storage. A positive influence on the reduction of biogenic amines was observed in both producers except for the producer No. 2, where a higher number of putrescine was found in comparison with the situation when no probiotic culture was added.

Key words: biogenic amines, HPLC, *L. casei*, fermented sausages

CONTAMINATION OF FEEDSTUFFS BY PHTHALIC ACID ESTERS

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Abstract: Phthalic acid esters (PAEs) are a class of widely used industrial compounds. PAEs may be found in some types of flooring, medical devices, children´s toys, packaging etc. From packaging and environment PAEs get into feedstuffs. The aim of my investigation was to determine the occurence and contents of DBP (dibutyl phthalate) and DEHP (diethylhexyl phthalate) in feedstuffs. Samples of feedstuffs (n=46) were taken from the industrial producers in the Czech Republic. At first samples were extracted by organic solvents to get the fat. Co-extracts were removed by gel permation chromatography (GPC). The eluate was cleaned by hydrated sulphuric acid and analysed by HPLC. Measured concentrations DBP, DEHP and ∑DBP+DEHP varied according to fat content. In raw materials levels of ∑DBP+DEHP ranged between < 0.03 mg.kg-1 (detection limit) in soybean extracted meal and soybean oil (148.2 mg.kg-1). Feed additives contained lower amounts of ∑DBP+DEHP – from 0.18 mg.kg-1 (Alimet) to 1.59 mg.kg-1 (Glycerin E 422). Analysed concentrations in premixes were between detection limit (Premix – fytasa) and 22.94 mg.kg-1 (Euromold Sal). The highest levels were measured in samples with high fat content and according to group of feedstuffs, the most contaminated were raw materials.

Key words: phthalate acid esters, feedstuffs, DBP, DEHP

Acknowledgments: This study was carried out within the scope of project NAZV QG60066/2005, supported by the Department of Agriculture, Res. & Dev., Czech Republic

SELECTED FACTORS INFLUENCING BIOGENIC AMINE CONTENT IN FERMENTED MEAT PRODUCTS

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Abstract: The objectives of the study was to evaluate an effect of selected factors (2 producers, 2 starter cultures, 2 diameters of products and 2 spice mixtures) on growth of bacteria with supposed ability to form biogenic amines (genus *Enterococcus*, lactic acid bacteria [LAB], total anaerobic counts [TAC]). The samples were taken during fermentation (0 – 28 days) and during storage until 112 days. Respective Czech national norms (ČSN) were used to determine the microorganisms. Biogenic amines (tyramine, histamine, phenylethylamine, cadaverine, putrescine, spermidine, spermine) were determined by the HPLC method. At the end of fermentation (28^{th} day), the tyramine content exceeded the toxicological limit of 100 mg kg^{-1} in all products, varied between 145 – 285 mg kg^{-1} and was influenced ($P<0.05$) by producer and starter culture, respectively. TAC were significantly ($P<0.05$) influenced by producer, *Enterococcus* counts by starter culture. Tyramine content was negatively correlated ($P<0.05$) to TAC ($r = -0.19$) and enterococci ($r = -0.33$). Non-existent or negative correlations between biogenic amine content and the TAC, LAB, and *Enterococcus* counts, respectively, indicate that the ability to decarboxylate amino acids is characteristic only to selected strains of respective microorganisms. Therefore we recommend to use the methods of molecular biology (detection of sequences of genes for respective decarboxylases with PCR) to identify the producers of biogenic amine in fermented products. These data are currently being analysed.

Key words: biogenic amine, tyramine, HPLC*, Enterococcus*

MONITORING OF PHTHALATES CONTAMINATION IN BROILER CHICKS AND COMPARISON OF CCUMULATION OF DEHP AND DBP IN TISSUES

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Abstract: The objectives of this study were investigation of di-2-ehtylhexyl phthalate (DEHP) and di-n-butyl phthalate (DBP) amount in the edible chicken tissues and compare the accumulation of these two the most spread esters of phthalic acid. The chickens ROSS 308 in our experiment were fed by common feeding mixture without addition of any phthalate esters for 42 days and then they were slaughtered. There were analyzed lyophilisated skins, muscles (breasts and thighs), adipose tissues and liver samples. Our method was comprised of four separated steps. Extraction of fat from all samples with using organic solvents was the first step. Second was separation by gel-permeation chromatography followed by cleaning of eluate with concentrated sulfuric acid. The last fourth step comprised of high performance liquid chromatography with UV detection. DEHP and DBP were detected in all investigated samples. The resulting average contents of phthalates are: 0.35 $mg.kg^{-1}$ DEHP; 0.22 $mg.kg^{-1}$ DBP in muscle, 1.18 $mg.kg^{-1}$ DEHP; 0.36 $mg.kg^{-1}$ DBP in skin, 1.36 $mg.kg^{-1}$ DEHP; 0.47 $mg.kg^{-1}$ DBP in adipose tissue and 0.16 $mg.kg^{-1}$ DEHP; 0.02 $mg.kg^{-1}$ DBP in liver. Our measurements proved lipophilic character of phthalates. That means that adipose tissue is useful indicator of phthalic acid esters contamination. Relatively high contents of DEHP and DBP contamination are due to presence of PAEs in dust, soil, indoor and outdoor air, water and feed. Liver, despite containing more fat than muscles, had lower values of PAEs mainly because of their enzymatic base, which were transforming to their metabolites. The values of DEHP were higher than contents of DBP in all samples.

Key words: Phthalic acid esters, DEHP, DBP, chicken.

Acknowledgments: This work has been supported by Czech National Agency for Agriculture Research (NAZV CR), project QG60066/2005.

CHANGES OF SENSORY QUALITY OF „METTWURST“ DEPENDIDG ON VEGETABLE OIL USED IN THE PRODUCTION

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Abstract: World Health Organization recommend to decrease fat intake on 30 % from all daily intake energy. Meat products as a „Mettwurst“ contain about 50 % of animal fat with saturated fatty acid. They are not recommend for periodic consummation. For that reason we can use vegetable or fish oil in this production of meat products, which contain mostly non-saturated fatty acid. The other way how to increase nutritive quality of those fermented products is to use probiotic cultures. Using of probiotic cultures can influence the sensory quality of meat products. The aim of this work was sensory evaluation of heat untreated meat product „Mettwurst“ which was produced with coleseed and sunflower oil and evaluation of influence of using starter and probiotic cultures on sensory quality of these products. There were used starter culture Pediococcus pentosaceus (1, 4), probiotic culture Lactobacillus casei (3, 6) and their combination (2, 5). Sensory quality were evaluated by ten well-educated assessors from the Department of Food Technology in a sensory lab accommodated to the ISO 8589. It stands to reson the influence of using vegetable oil on sensory quality of „Mettwurst“. More expressive were assessed the sunflower oil but the coleseed oil was specifical in its smell and taste. The adverse effect had a coleseed oil on sensory evaluation of this products. Another effects on sensory evaluation had a starter and probiotic cultures. The best evaluated were assed the samples with Pediococcus pentosaceus (1, 4) and Lactobacillus casei (3, 6) used separately. The sensory evaluation were finished after 14 days of storage. It was one week to minimal endurance time but the samples were uneatable. It appears from this that we can use vegetable oil as a imitation of animal fat but we must reduce minimal endurance time. The desintegration of vegetable oil is more quick than of animal fat.

Key words: Mettwurst, sensory evaluation, vegerable oil, probiotics, fat content

DETECTION OF FUNGAL CONTAMINATIONS IN POWDERED PEPPER USING MOLECURAL BIOLOGICAL METHODS

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Abstract: Detection of microbiological contamination in foods has always been a challenging undertaking. Because pathogenic fungi may be present at very low levels, they can be difficult to detect in foods, and components of the foods may also interfere with their detection. The only problem needn't be only the presence of fungi but their products called as mycotoxins could be also big risk for human health. The most useable spice in Czech Republic is red dry pepper in milled composition which is used in food industry as a part of spicy mixtures especially for meat industry. In these days are in Czech Republic used for detection classical cultivation methods as a cultivation on the plates. These methods are strict but time consuming. It is between days and one week. One from the advantages of molecular biology is sparing time. We used PCR with specific kits for isolation DNA from the samples red powdered pepper and in next step we amplified DNA for next secvenation and detection of the concrete contaminant in our sample of red powdered pepper. We detected species of fungus Nectria mauritiicola which cause antraktosis of plant. It means that sample under the investigation shouldn't be risk for human health. This showed that molecular biological methods could be used for fungus contaminant detection directly in powdered pepper.

Key words: contaminant detection in spice, *Nectria mauritiicola*, pepper, PCR

Acknowledgments: This work was made in co-operation with the private company Trumf International Ltd.

THE QUALITY OF SPRING BARLEY IN DEPENDENCE OF PLANT NUTRION OF NITROGEN AND SULPHUR

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Abstract: In 2006 and 2007 in small-plot field trials established on plots of the Agrospol agricultural enterprise in Velká Bystřice near Olomouc we explored the effect of nitrogen and sulphur applied in various types of sulphuric fertilisers (ammonium sulphate and elementary of sulphur) with nitrogenous corrections on yields and mechanical grain quality of barley grain (chemical composition of grain, volume weight, number full grains, content of starch and nitrogen matters). Species of spring barley Jersey was placed in this experiment. In 2006 yield of grain increasing on on concentration of sulphur in barley, where were application of ammonium sulphate on basic fertilization. There were also increase fertilize of nitrogen volume weight of grain and there were production heavier grains. Correction negatively influencing content of starch but vice versa increasing content of nitrogen matters. In 2007 were yield with application of ammonium sulphate as same as with application of elementary sulphure.

Key words: barley, nitrogen, sulphur, yield, grain quality

Acknowledgments: The benefit arose as exit of plan MZe with title „ Inovation flocultural technology of spring barley progress of diagnostic methods for evaluation structur growth, health and nutrient status“ no. 1G58038 and plan MŠMT with title „Research centre for studies contentual matters of barley and malt“ no. 1M0570.

THE IMPACT OF WINTER STORAGE OF LIVING CARPS ON RESENCE OF PHTALATE ESTERS IN MUSCLE

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Abstract: Our aim was to determine the content of di-n-butyl phthalate (DBP) and di-2-ethylhexyl phthalate (DEHP) in carps. We selected carps from area in South Moravia. First group of carp was fished in autumn and second group was located to the plastic tubs until the winter. Samples of fishes were lyophilized and extracted with solvent mixture (acetone:hexan =1:1). We used gel permeation chromatography with column Bio-Beads S-X3 to clean the samples. The levels of DBP and DEHP were determined by high performance liquid chromatography with column Separon SGX C 18 with UV detection.

The results show that occurrence of DBP and DEHP was evident in all samples. The concentration of DBP and DEHP in carps was in range from 0.29 $mg.kg^{-1}$ of original weight to 1.93 $mg.kg^{-1}$ of original weight in the autumn group. After the winter storage was detected the level of DBP and DEHP in range from 0.86 $mg.kg^{-1}$ of original weight to 2.10 $mg.kg^{-1}$ of original weight. It is obvious that DEHP is more strongly absorbed by sediment than DBP, and its concentration in aquatic environment is lower than DBP. Thus the bioavailability of DEHP is lower than DBP. The difference in intake of DBP and DEHP might be associated with their different physiological and chemical properties.

Key words: phthalates, contamination, fish, DBP, DEHP

Acknowledgments: This study was supported by the Ministry of the Agriculture of the Czech Republic of the National Agency for agricultural research (NAZV), project No. QG60066/2005.

Section – Plant Biology

PROTEOME ANALYSIS OF *ARABIDOPSIS THALIANA* TRANSGENIC PLANTS WITH INCREASED LEVELS OF ENDOGENOUS CYTOKININS

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Abstract: Cytokinins are plant hormones that play important roles during plant development and growth. In particular, they influence chloroplast development, nutrient mobilization, delayed senescence, morphogenesis (in association with auxin) and the cell cycle. Light quality and intensity are important factors that affect a range of plant processes. Some effects of cytokinin and light are identical. This fact led us to set up our experiments, whose aim is to identify changes at the protein level in plants grown under different light intensities. In our experiment we used two different light intensities (100 and 200 mol m-2 s-1) and transgenic A. thaliana plants with pOp-ipt::35S-LhGR, a construct whose activity is inducible by a suitable activator, generating increases in cytokinin levels. Proteome analysis was performed by 2D gel electrophoresis and subsequent comparison of proteome maps using Decodon Delta 2D software, version 3.6. Total number of resolved spots was 726 and 17 spots showed statistically significant changes indicating presence of differentially regulated proteins. The differentially regulated proteins were identified by MALDI-TOF/TOF. The highest number of changes in protein expression was observed on the fifth day after activation.

Key words: cytokinins, light, proteome, 2D electrophoresis

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THE SEPARATION OF GRAPEVINE (*VITIS VINIFERA L.*) CONCULTA MEMBERS WITH MOLECULAR MARKERS

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Abstract: The berry color is one of the most characteristic in case of grapevine cultivars (*Vitis vinifera* L.). This morphological property is important to make difference between the cultivars in the time of the full maturity. Complemented with the patterns of the leaf, bunch, vine, shoot-tip could be enough to identify a cultivar. Two main groups can be made according to the color of the berry, white and red wine cultivars. The red wine cultivars contain anthocyanin in the epidermal section of the berry. The amount and concentration of the coloring matter define the typical color of the cultivars. *VvmybA1* (a *Myb*-related transcription factor) regulate the anthocyanin synthesis, consequently the function of this pathway responsible among others to the berry skin. The presence of the retrotransposon *Gret1* near to the coding sequence of *VvmybA1* causes the white berry skin with the blocking of the expression of the gene.

In this study we demonstrate the separation of the grapevine cultivars which different from each other visibly only in the color of the berry. Two main methods used: SSR (Simple Sequence Repeat) and the *Gret1*-based separation of the cultivars. Such as Pinot, Chasselas, Bajor, Gohér group of cultivars can be distinguishes according to the presence or absence of the *Gret1* in their promoter region or with SSR analysis.

Key words: *VvMYBA1*, retroelement, SSR, group of cultivars

PLANT TRANSPOSABLE ELEMENTS AS A TOOL FOR GENE LOCALIZATION

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Abstract: Transposable elements (TE) and retroelements are frequently co-localized with heterochromatin and non-coding regions of genome. MITE elements (Miniature Inverted-repeats Transposable Elements) is a class of small TE without their own transposase. Surprisingly, MITEs are often found in the vicinity of genes in some model species (rice, maize). Mechanism of transposition of these elements to coding regions is still unclear. Plant genomes have often extremely huge size and are composed of mainly repetitive sequences. Many tools were designed to subtract coding DNA (genes) from rest of genomic DNA. In this paper, we focused on using MITE elements as a tool to find new genes in *Silene latifolia* genome. *S. latifolia* is a model plant for studies concerning sex chromosome evolution. Non-recombining chromosome Y is potentially affected by degeneration processes which reduce expression of Y linked genes. Previous methods used for identification of Y linked alleles enabled to identify only several candidates. We investigated distribution of some MITE elements in genome of *S. latifolia* in context of gene distribution. Based on GenBank data we identified a MITE element in *S vulgaris*. This species is closely related to *S. latifolia* and enabled us to characterize a homologue of the element in this species. We screened a BAC library of genomic clones with both MITE probe and complex probe containing previously published genes. We found strong co-localization of MITE element and genes in *S. latifolia*. We suggest to use MITE probe as a useful tool to find new genes in genomic libraries in *S.latifolia* and related species.

Key words: Transposable elements**,** MITEs, *Silene species*, BAC library, gene localization

Acknowledgments: This project was supported by the Grant Agency of the Czech Republic (grant 204/05/H505) and Ministry of Education (grant LC06004).

ISOLATION OF PHOSPHOPROTEOM AND ITS APPLICATION IN STUDY OF THE EFFECT OF CYTOKININ ON PLANTS

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Abstract: Phosphorylation is one of the most important posttranslational modifications in proteins. It is also a major issue in modern proteomics. Its application in plant research is rather scarce. We present here development of optimized protocol for phophoprotein enrichment kit (Quiagen) for extraction of plant phosphoproteom. This protocol allows reusing of affinity column designated for single use only up to 3 times with phosphoproteom quality unaffected. We also provide example of application of this improved protocol in research of cytokinin activation pathway in plants.

Key words: phosphorylation, plant proteomics, cytokinin

Acknowledgments: This work is supported by LC06034 and 1M06030.

MOLECULAR DIAGNOSIS OF BYMV IN GLADIOLUS PLANTS

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Abstract: A one step reverse-transcription polymerase chain reaction (RT-PCR) method was used to detect *Bean yellow mosaic virus* (BYMV) in gladiolus plants. One step RT-PCR analysis, employing primers specific to BYMV with different gladiolus cultivars. Total RNA was extracted from leaves and corms of gladiolus plants. Total RNA from leaves and corm were used to amplify specific primer sequence of BYMV. The one step RT-PCR method determined BYMV in all leaf samples and in corms it revealed very weak amplification. The aim of this paper is to discuss the diagnosis method from one step RT-PCR in leaves and corms of gladiolus plants.

Key words: Gladiolus, corms and leaves, BYMV detection, RT-PCR

PURIFICATION OF MUTANT FORMS OF β-GLUCOSIDASE (HIS)6ZM-P60.1 (*Z. MAYS*)

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Abstract: β-Glucosidases serve different roles in plant and indeed we find that plants have several different groups of this enzyme. Some of them can release active zeatin from zeatin-*O*-glucoside, a cytokinin conjugate thought to be the transport or storage form. One such enzyme is Zm-p60.1 from Zea mays. We have over-expressed the cDNA encoding Zm-p60.1 in *E. coli* and subsequently purified the recombinant protein using a purification (Zouhar et al., 1999, Filipi, 2007, Dopitova et al., 2008). It was necessary to confirm purity of wild-type, as well as mutant forms (F461L, F193A, F200K, W373K and E401D), because of its biochemical data interpretation. Unfortunately, low molecular ballast proteins were still presented in the active (dimeric) fractions of enzyme, thus the purification routine (Filipi, 2007) have been supplemented with other second gel filtration run. By addition with second gel chromatography step, enzymes yield in high homogeneity without any ballast proteins. Moreover, we have occurred, that after 2nd gel filtration step of dimeric fraction of wild-type, F193A, F461L, only the dimeric fraction have been eluted. On the other hand, in case of F200K and W373K, both forms of enzyme have been isolated. According to gel filtration, the molecular weight of dimeric and monomeric enzymes have been correctly enumerate to 107-117 kDa, 40-47 kDa, respectively. It was also confirmed, that only dimeric form of enzyme fixed in gel (NATIVE-PAGE) was able to release staining indigo blue form chromogenic substrate 4-brom 3-chlor 3-indolyl-β-D-glucopyranoside (XGLU), while monomeric was not.

Key words: β-Glucosidase, maize, zymograme, NATIV-PAGE, 4-brom 3-chlor 3-indolyl-β-D-glucopyranoside

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EFFECT LOW LIGHT INTENSITY AND INCREASE CONCENTRATION OF CYTOKININS - PROTEOMIC ANALYSIS

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Abstract: Together with auxins, cytokinins are key substance in hormonal regulation of plant development. All native cytokinins are derivatives of adenine with substituent at N6 position. Cytokinins affect growth and regeneration of plant. Molecular mechanism of they effect in regulation of plants development is intensively study now. The analysis of genome during cytokinins action was search, but complete analysis of proteomic dynamics isn't known. It was analyzed effect low light intensity and increase levels of cytokinins. It was used the pOp/LhGR system to increased levels of cytokinins. Experimental system was plant *Arabidopsis thaliana*. The changes of proteome analysis were studied by 2D electrophoresis, scene analysis a mass spectrometry. It was observed the effect of cytokinins on hypocotyl length in the low light conditions. It was compared proteome by seedlings with increase levels of cytokinins and wild type. It was identified about 30 different proteins.

Key words: *Arabidopsis thaliana*, cytokinins, hypocotyl, 2D electrophoresis

Acknowledgments: This work is supported by LC06034 and 1M06030.

DEVELOPMENT AND OPTIMIZATION OF GENETIC TRANSFORMATION SYSTEM FOR GRAPE

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Abstract: We have established a successful Agrobacterium-mediated transformation system for several important grapevine cultivars. Genetic transformation is based on the existence of an effective regeneration method. Different types of explants have been tested for their ability to produce somatic embryos on inducing medium. To optimize the conditions of the transformation system we examined the effectiveness of different Agrobacterium-treatments, the use of antioxidants and phenol-bindings, and the adequate amount of kanamycin for the purpose of selection. The developed transformation system allowed the recovery of germinating transgenic embryos and regenerated plantlets.

Key words: *Agrobacterium tumefaciens*, somatic embryogenesis, plant grow regulator, transgenic plantlet

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OXIDATIVE STRESS IN PLANTS WITH ELEVATED LEVEL OF CYTOKININS

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Abstract: Cytokinins are plant hormones well known as positive regulators of shoot development and agents delaying senescence onset. Recently negative role of cytokinins like reduction in leaf expansion and promoting programmed cell death, started to be recognised. In accordance with this, endogenous increase in cytokinin level in our model plants - *Arabidopsis thaliana* and *Nicotiana tabacum*, cause phenotype resembling plant undergoing oxidative stress. To confirm this we have performed histochemical and fluorescent staining which reveal increase in the level of reactive oxygen species (= ROS). Normaly ROS level is carefully controlled by antioxidants and antioxidant enzymes like ascorbate peroxidase and catalase. We have measured activity of these enzymes via spectrophotometric assays and found that activity of both of them was depressed. The level of transcript of *APX1* gene measured via quantitative RT-PCR method was also decreased. Contrary transcripts of the early light-inducible proteins ELIP1 and ELIP2, potential markers of the stress, were increased. In some cases increase in the level of antioxidants can prevented from oxidative stress. Therefore we have fed plants with reducing agent glutathione (=GSH) and observed predicted improvement of the plant phenotype. In summary we have revealed that higher levels of cytokinins cause oxidative stress, which can be explained by diminishing of the capability of the antioxidant enzymes. Feeding plants with reducing agent GSH can partly prevent severity of this damage.

Key words: Cytokinin, Oxidative stress, ROS, Ascorbate peroxidase, Catalase

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INTERACTION OF LIGHT AND CYTOKININS IN *ARABIDOPSIS THALIANA* – STRESS AND ANTHOCYANIN BIOSYNTHESIS

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Abstract: Light and cytokinins interact in a number of growth, developmental and physiological processes in plants. One example is anthocyanin biosynthesis that helps protect against various biotic and abiotic stresses. The involvement of cytokinins in this process is not fully understood. Further, we suppose that not only light but also cytokinins are implicated in oxidative stress. To study the interaction of light and cytokininis in the induction of anthocyanin biosynthesis we employed transgenic *Arabidopsis thaliana* seedlings (line 11.5) with an activable *ipt* system where activation leads to the induction of isopentenyltransferase (*ipt*) expression and consequent increased cytokinin biosynthesis. Plants cultivated in soil under a light intensity of 100 photons μmol m^{-2} s^{-1} were activated and then cultivated under the same light intensity or under higher light intensity (200 μmol photons m^{-2} s^{-1}). This increasing of light intensity induced *Elip* genes which are expressed only under light-stress conditions so that light intensity of 200 photons μmol m^{-2} s^{-1} could be assumed as slight light-stress. Increased light intensity as well as activation lead to anthocyanin accumulation and the effect of light and cytokinins on increasing the anthocyanin content was multiplicative. To elucidate whether anthocyanins and other flavonoids are implicated in tolerance to increased light intensity and/or increased cytokinin level we investigated *transparent testa 4* (*tt4*) mutant which is deficient in flavonoid biosynthesis. *tt4* mutants did not show any lesions, chlorosis or other marks of severe stress under increased light intensity (350 photons μmol m^{-2} s^{-1}) and/or cytokinin treatment. No changes in content of chlorophyll and total carotenoids were observed in *tt4* mutants. Taken together, anthocyanins do not serve an important function in protection against stress-promoting conditions such as moderate light stress and increased cytokinin levels.

Key words: cytokins, anthocyanins, flavonoids, transparent testa mutants, stress

Acknowledgments: This work was supported by grants LC06034 and 1M06030 (Ministry of Education of the Czech Republic).

USING OF MICROSATELLITE MARKERS FOR IDENTIFICATION OF DUPLICATIONS IN COLECTION OF GENETIC RESOURCES OF PEPPER (*CAPSICUM* L.)

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Abstract: Within a collection of 41 genetic resources of red pepper genotypes (*Capsicum annuum* L.) genetic variability using 8 microsatellite markers was tested. Three of the microsatellite markers (*Hpms 1-1*, *Hpms 1-168*, and *Hpms 1-274*) provided uniform spectra in all analyzed genotypes. From 2 to 7 alleles were detected for the rest of microsatellite loci. Totally 27 alleles were detected, which means an average of 4.0 allele per one microsatellite locus. The size of amplified products was determined within the limits of 172 – 340 base pairs. The highest number of different alleles was detected using *Hpms 1-5* and *Hpms 2-21* primers (7 alleles). The calculated average DI value was 0.33 (0.00-0.74), average PI value was 0.55 (0.04-1.00) and average PIC value was 0.32 (0.00-0.73). The low value of PIC indicates higher level of genetic similarity between analyzed genotypes. Based on statistical evaluation a dendrogram of similarity was constructed. Distribution of the analyzed genotypes in the dendrogram implies a high level of similarity within some genotypes and on the contrary there is a presumption of genetically different material within other genotypes of the same or similar name. Molecular data were complement with morphological measurement by descriptor lists for genus Capsicum. These results show the possibility of duplicities in the current collection of genetic resources of red pepper.

Key words: genetic resources, pepper, *Capsicum* L., microsatellites, SSRs

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STORAGE PROTEINS AND ABSCISIC ACID IN ZYGOTIC EMBRYOGENESIS OF PEA (*PISUM SATIVUM* L.)

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Abstract: Our aim was to describe relationship between endogenous content of abscisic acid (ABA) and level of storage proteins in isolated embryos of pea *in vitro*. Decrease the level of ABA and the level of storage proteins through the application of 20 µM flurochloridone in proces of dessication and evoke embryos to germinate. At the conclusion deduce correlation between ABA, storage proteins and germinating in embryos maturation from results. We isolated embryos 9, 15, 22 and 30 days after pollination (DAA) from pea controle plants and with aplication 20µM flurochloridone. Imature and mature embryos were cultivated *in vitro* on MS medium (MURASHIGE and SKOOG 1962) with 30 g sucrose or 80 g sucrose with or without 20 µM flurochloridone and 10 µM ABA. ABA were analysed by RIA (radioimunoanalytic) method (QUARRIE et al. 1988) with using monoclonal antibody MAC 262. SDS polyacrylamide electrophoresis (LAEMMLI 1970) was used for analysing storage proteins. By cultivation of isolated embryos *in vitro* were judged living and germinating of embryos (%). Statistical evaluation (t-Student´s test) were used in analyses of ABA and repeated four times. By the help of flurochloridone which decreased level of ABA biosynthesis we observed morphological changes in embryos. Plants with application of flurochloridone had lower level of ABA in embryos and endosperm. For cultivated isolated embryos *in vitro* were characteristic that embryos without cotyledons did germinace more intensively already on medium with adition of flurochloridone. Rippening cotyledonary embryos from control plant had eminently representation of storage proteins with relation to upper level of ABA in maturation. Storage protein deposition were in relation to desication governed by the enhancement level of abscisic acid in embryo's tissue and seed.

Key words: pea, embryogenesis, storage protein, abscisic acid, flurochloridone

DNA POLYMORPHISM OF DOUBLE - HAPLOID LINES PARENTS INTENDED FOR GENETICAL MAPPING

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Abstract: Study of molecular polymorphism between Derkado and B83-12/21/5 was aim of our study since their segregating progeny (double - haploid lines, DHs) will be used for genetic mapping of loci responsible for seed vigour in barley. Till yet was not identified a locus for this trait in cereals. This population enabled mapping of some traits, including root system size, yield and resistance to diseases. Eighteen SSR (Simple Sequence Repeats) markers were polymorph in comparison of the parents on chromosomes 1H, 5H and 7H. Polymorphism in segregating four CAPS (Cleaved Amplified Polymorphic Sequences) markers was identified by restriction enzymes on 7H chromosome. SSR and CAPS markers were selected using published QTL maps of the population. Markers were detected by agarose gel electrophoresis. We will continue on polyacrylamid-gel which could identity new polymorphism. It is a presumption for genetic mapping, if sufficient variability in the seed vigour of the DHs will be found.

Key words: polymorphism, SSR, CAPS, barley

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VARIABILITY OF MICROSATELITTE MARKERS IN GENUS THYMUS

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Abstract: The genus *Thymus* (*Lamiaceae*) is taxonomically a very complex genus with a high frequency of hybridization and introgression among sympatric species. Co-dominant molecular markers provide an important tool for studies on mating patterns and breeding systems. Here we evaluated genetic diversity of different *Thymus* species (*Thymus serpyllum* L. emend. Miller, *Thymus praecox* Opiz., *Thymus pulegioides* L., *Thymus pulegioides* L. subsp. *chamaedrys* (Fries) Gusul., *Thymus valesciacus*, *Thymus pulcherrimus* subsp. *sudeticus* (Lyka) P. A. Schmidt) by using 3 co-dominant SSR markers pursuant witch we analyzed locus E089, D347 and D257. It was detected 36 polymorphic alleles in 37 plants. The frequency of polymorphic alleles for each species population was obtained. In 3 individual plants we established more than 2 alleles at least in one locus. Similarity relationships between populations were described graphically by a dendrogram, which clustered the three populations with the TFPGA (tools for population genetic analysis) program (Miller). The statistical relation between population size and the number of polymorphic alleles was verified.

Key words: SSR, genetic diversity, *Thymus*, TFPGA.

Acknowledgments: This work was supported by the grant from Czech university of Life science Prague in project "Molecular characterization and *in vitro* cultivation of genus *Thymus* and *Plantago*". We would also like to acknowledge Crop Research Institute, Division of Vegetables and Special Crops – Olomouc, which took part with project number NAZV: EP 7199 "Selection of native medicinal and aromatic ecotypes, the propagation technology recommendation and introduction into chosen localities".

SEGREGATION ANALYSIS OF AGRICULTURAL IMPORTANT TRAITS OF APPLES

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Abstract: Segregation of four PCR markers was tested in this work. There were chosen markers describing red flesh, softening of flash, resistance to scab (*Venturia inaequalis)* and resistance to powdery mildew (*Podosphaera leucotricha*). Segregation of these markers was rated by χ^2 test in four F1 progenies: cross 4 – HL 37 (Florina x *M .robusta*) x Flordika, cross 22 – HL 39 (Florina x *M. robusta*) x Rubinstep, cross 27 HL 804 (FAW 3566 x A 679-2) x HL 39 (Florina x *M. robusta*), cross 21 – HL 423 (Florina x *M* .robusta) x Rubinstep. Cross 4 was already selected by infection tests in a greenhouse. In this cross was detected more dominant homozygotes (51,4 %) and heterozygotes (32,4 %) in *Vf* gene, than was expected. By segregation analysis of *Vf* gene and *Md-ACS1* gene was found, that variety Rubinstep was not fatherly component of crosses 21 and 22. In this segregation analysis was found, that markers of genes *MdMYB10*, *Md-ACS1*, *Vf* and *Pl1* could be used in MAS (marker-assisted selection).

Key words: Apple, segregation analysis, MdMYB10 gene, Md-ACS1 gene, Vf gene, Pl1 gene

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Section – Animal Biology

VERIFICATION AVAILABILITY MICROSATELLITES PANEL FOR PARENTAGE IDENTIFICATION OF DIFFERENT CANINE BREEDS

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Abstract: We tested 124 individuals of different canine breeds (number of 7 Dachshunds, 5 Schnauzers, 12 German Spitzs, 4 Yugoslavian Shepherd Dogs, 6 Rhodesian Ridgebacks, 5 Belgian Shepherds, 64 Bernese Mountain Dogs, 8 Czech fousek, 5 Irish Wolfhounds, 8 Golden Retrievers). They were chosen for determination reliability microsatellites panel of commercial kit StockMarks® for Dogs Canine Genotyping System, firm Applied Biosystems (FHC 2010, FHC 2054, FHC 2059, PEZ 1, PEZ 3, PEZ 5, PEZ 6, PEZ 8, PEZ 12 and PEZ 20). We evaluated statistic values from gained data (Polymorphism information content, Theoretical heterozygosity, Paternity exclusion, Combined exclusion probability).

PIC in population ranged from 0 (FHC 2054 and FHC 2079 Golden Retriever and PEZ 6 Belgian Shepherd) to 0,7786 (PEZ 1 Dachshund). Theoretical heterozygosity was from 0 (FHC 2054 and FHC 2079 for Golden Retriever, PEZ 6 for Belgian Shepherd) to 0,7813 (PEZ 1 for German Spitz). The highest CEP was quantified for Dachshund (0,9977, 0,9645, 0,9999), on the other hand the lowest CEP was for Belgian Shepherd (0,8607, 0,6135, 0,9619).

Used microsatellite panel is supposed to be high reliable for parentage testing and individual identification these canine breeds.

Key words: canine microsatellites, markers, parentage verifying

KIT GENE POLYMORPHISM IN ASSOCIATION WITH HORSE COAT COLOUR – TOBIANO

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Abstract: Tobiano spotting pattern is characterized by large patches of white that cross the dorsal midline and include legs. This pattern is caused by dominant gene *To*. Polymorphisms in *KIT* gene are associated with different spotting patterns, including tobiano. Totally 61 tobiano horses and 89 non-tobiano horses were tested by PCR-RFLP for polymorphism in intron 13 of the *KIT* gene and for chromosomal inversion on ECA3 (distal breakpoint is localized near *KIT*). Association of SNP in intron 13 was not absolute – 3 horses with just one tobiano parent were found homozygous.

But in case of chromosomal inversion test, only tobiano horses with both tobiano parents were homozygous. This marker is suitable for zygosity testing. Results suggest, that chromosomal inversion on ECA3 could cause tobiano spotting pattern in horses.

Key words: horse, coat colour, tobiano, *KIT*, polymorphism.

THE ANALYSIS OF MICROSATELLITES RELATING TO POLLEDNESS IN BEEF CATTLE

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Abstract: This work deal with studying of microsatellites (BM6438, TGLA49, BMS2142 and IDVGA46) relating to polledness and to scurs in families of beef cattle and studying of genetic linkage of the alleles to the polled phenotype or to the scurs.

Polled condition of cattle is an autosomal dominant trait controled by the polled locus which is localised in the centromeric region of bovine chromosome 1 between microsatellites RP42-218J17_MS1 and BM6438. The absence of horns is complicated because of presence of scurs whose expression is sex-influenced. The scurs locus has been mapped on the bovine chromosome 19 between microsatellites BMS2142 and IDVGA46. The causative genes of polledness and of scurs remain unknown.

This present study is aimed to analysed 2 breeds (Simmental – 77 animals from database of DNA samples of ÚMFGZ of MZLU in Brno, and Charolais – 47 animals from T-farm in Verušičky) with 5 families of different number of members. Microsatellite analysis involved multiplex PCR amplifying of microsatellites loci, detection of fluorescent labeled fragments (alleles) by laser, making of genotypes of the animals indicating polledness, horns or scurs. In families 1, 2 and 5 it was found linkage between alleles of microsatellites BM6438, TGLA49 and polled condition and linkage between alleles of microsatellite BMS2142 and scurs. This linkage was confirm by significant association between genotype and phenotype of polledness or scurs. The alleles of microsatellites (linked with phenotypes) were different and this is the evidence of different mutations across the families, probably from different breeds of cattle.

Key words: polledness, scurs, microsatellites, beef cattle

GENETICS ANALYSIS OF WHITE SPOTTING IN THE DOGS

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Abstract: White spotting in dogs appears to be controlled by a major simple recessive locus. *MITF* was identified as the candidate gene for white spotting in dogs. Complete co-segregation with SPN in intron 3 was found in this gene and recessively inherited, random or piebald spotting in Schipperke, Beagle crossbreds and Newfoundlands. The aim of this work was to optimise the method conditions in our laboratories and to verify the SNP for testing of white spotting in the dogs. We used PCR-RFPL assay for breed testing Newfoundlands, Rhodesian Ridgeback, Great Dane and Pug Dog, but we did not confirm the aforesaid SNP. Therefore analyses of this candidate gene will continue in the future.

Key words: white spotting, dog, genetic marker

RESULTS EVALUATION OF PREDICTION POLLED/HORNED CATTLE IN MEAT SIMENTAL

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Abstract: The proposal of this project was to develop method to determinig polled or horned individuals in Meat Simenatal cattle breed. The main method was set up using recent literature as well as patent published in USA (US2005153328), togehter with microsatelite analysis published at the beginning of 90s‘.

A single gene in cattle controls the horn development trait and the polled phenotype is dominant to the horned phenotype. Thus, hornless cattle may be either heterozygous (horned carriers) or homozygous for the polled allele and the ability to distinguish between carriers and non-carriers is crucial to breeding programs. The physical detection of horned or polled cattle is further complicated by the presence of scurs. Scurs are rudimentary horns that are usually small and loosely attached to the head but can be large and attached well enough to make them difficult to distinguish from horns (Brenneman et al., 1996).

Total amount of 63 animals were analysed in 7 SNPs and 2 microsatelite loci. Five genotypes were known at the beginning because they were horned.

We were able to established or predicted genotype in 28 animals in total of 58 (63 animals were used and 5 of them were horned, we had already known their genotypes).

Prediction success of genotypes was to low (less than 50%) due to missing microsatellite loci used in recent experiments by the authors.

For the further experimetns, some SNPs should be removed (for ex. MMBTA25303) and be replaced by another one. Also, 3 of 5 microsatelite loci should be added in experimet (for ex. ARO9, ARO24, SOD1MICRO2) for better analysis in families groups.

Key words: polled/horned cattle, SNPs, microsatelite, haplotype, DNA sequencing, PCR-RFLP

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USAGE OF CHITOSAN FOR DNA AND BIOLOGICAL SAMPLES´ STORAGE

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Abstract: The main aim of this study was to find the appropriate way of DNA or biological samples´ storage on chitosan medium (prepared by Food Research Institute in Prague). While storing these samples on chitosan, it should be possible to keep this material at the room temperature for a long time. We tried to store the isolated genomic DNA, blood, milk, meat, sperm, saliva and pieces of ears (all from livestock) on the chitosan in different thermal conditions to verify the influence of the environment on the sample quality. Isolation was done using JETQUICK Tissue DNA Spin Kit (GENOMED GmbH) and DNA was extracted using TE solution. Manipulation with the samples was very difficult. Comparing results of isolation or extraction DNA in four different intervals, we obtained DNA suitable for further analyses only from archived tissues. To disprove the presumption that the storing of biological materials (especially DNA) on chitosan is useless, we decided to continue in this experiment with another form of chitosan and direct the forthcoming studies to find the fitting way of blood and DNA storing.

Key words: Chitosan, DNA storage, DNA isolation

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THE POLYMORPHISMS OF PRNP GENE ASSOCIATED WITH BSE IN CATTLE

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Abstract: This study deal with the polymorphisms in *PRNP* gene which encodes the structure of this protein. The mutation which prevent the changes in normal prion protein to pathological form has not found in cattle but it has found the polymorphisms which offer significantly more often in cattle affected BSE. These polymorphisms are indel 12 bp and 23 bp in non-coding region of *PRNP* gene. The genotypes of these polymorphisms were determined by PCR and PCR-RFLP. It was tested 96 bulls of Holstein and 68 bulls of Czech Fleckvieh. In polymorphism indel 23 bp the highest frequence of heterozygous genotype was observed in Holstein, on the contrary the highest frequence of homozygous genotype of deleted allele was observed in Czech Fleckvieh. In polymorphism indel 12 bp the highest frequence of both deleted allels was observed in Holstein. In this breed homozygous genotype +/+ was observed too, compared to Czech Fleckvieh – in this breed heterozygous genotype was mostly represented. The genotype of this polymorphism of number of octapeptide repeat was determined also by PCR. In Holstein the genotype 6/6 was the most frequent, the genotype 5/5 wasn´t found. In Czech Fleckvieh the most frequent genotype was the same (6/6), but the genotype 5/5 was found and the genotype 5/6 was more frequent than in Holstein.

For indel polymorphism probable haplotypes were designed with combination of efects of both genotypes. Haplotype 23del/12del which is linked to increased danger of incidence BSE was the most often observed in both breeds. Haplotype 23ins/12ins whose some scientists connect with resistance was observed in the same frequence. The association analysis of all 3 polymorphisms in gene *PRNP* was made - indel 23 bp was observed in all 3 genotypes in Holstein and was statistically significantly associated with some breeding values.

Key words: BSE, prion, PRNP, polymorfismus, indel