



Faculty
of Agronomy

⁰⁹Agro
MendelNet



Mendel
University
of Agriculture
and Forestry
in Brno



90th
anniversary
1919–2009

Proceedings of
International Ph.D. Students Conference
November 25, 2009
Brno, Czech Republic

MENDEL UNIVERSITY OF AGRICULTURE AND FORESTRY IN BRNO

Faculty of Agronomy



^{'09} Agro
MendelNet

Proceedings of International Ph.D. Students Conference

2009, November 25th

BRNO

The Conference MendelNet⁰⁹ Agro was realized thanks to support of 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.

ISBN: 978-80-7375-352-8

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 has reflected the faculty's life and events. Probably the most important change of the conference image is its gradual increase of the number of sections, 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 students with the opportunity to present their contributions in face of their colleagues and scientific commissions. Students acquire experience with active presentation and defence of results obtained from research on diploma and doctoral thesis. The discussions among participants and students are very valuable because it is the best training procedure for proper thesis defence in front of the commission. The **MendelNet'09 Agro Conference** is an ideal form for scientific survey acquirement in a given specialization.

Prof. Ing. Ladislav Zeman, CSc.

Dean of FA MUAJ in Brno

Contents

Section Plant Production

POST-EFFECT OF INCREASING BOTTOM SEDIMENT ADDITIVES TO THE SUBSTRATUM ON LEAD UPTAKE BY PLANTS	
ARASIMOWICZ M., NIEMIEC M., WIŚNIEWSKA-KIELIAN B.	17
THE YIELD REACTION OF MALTING BARLEY ON SULPHUR AND NITROGEN FERTILIZATION	
BABIÁNEK P., RYANT P.	18
THE RELATION BETWEEN TEMPERATURE AND ONSET OF THE PHENOPHASES OF COMMON DOGWOOD (<i>CORNUS SANGUINEA</i> L.) DURING 1961 – 2008 IN THE CZECH REPUBLIC	
BARTOŠOVÁ L., ŽALUD Z.	19
INFLUENCE OF VEGETATION PERIOD ON THE NUTRIENT COMPOSITION OF ALFALFA	
DVOŘÁČKOVÁ J., DOLEŽAL P.	20
THE COMPARISON BETWEEN THE EVAPOTRANSPIRATIONS OF SHORT ROTATION COPPICE AND THE REFERENCE GRASSY SURFACE	
FISCHER M., ŽALUD Z.	21
EFFECT OF SULPHUR NUTRITION ON THE NUTRITIONAL VALUE OF BROCCOLI	
FRANKOVÁ M., RYANT P.	22
THE REACTION OF SUNFLOWER (<i>HELIANTHUS ANNUUS</i> L.) ON DIFFERENT DOSES OF N FERTILIZATION AND THEIR APPLICATION DATES	
GALLIKOVÁ M., KOVÁČIK P.	23
TESTING OF BIOLOGICAL SUBSTRATES FOR ANAEROBIC DEGRADATION	
HODOVAL J., PULKRÁBEK J.	24
OCCURRENCE OF FUSARIUM SPP. ON THE CORN KERNEL (<i>ZEA MAYS</i> L.)	
KMOCH M., ŠAFRÁNKOVÁ I.	25
ASSESSMENT OF REDUCED DOSES EFFICACY OF GLYPHOSATE BY CHLOROPHYLL FLUORESCENCE MEASUREMENT	
KOCUREK V., SMUTNÝ V.	26
THE ROOT SYSTEM CAPACITY DEVELOPMENT IN RELATION TO NUTRITION AND FERTILIZATION AND TILLAGE METHODS CONCERNING THE AMOUNT OF GRAIN PRODUCTION OF SPRING BARLEY	
KUPECSEK A., MOLNÁROVÁ J.	27
EFFICACY COMPARISON OF CONVENTIONAL AND ORGANIC FUNGICIDAL SYSTEMS AGAINST POWDERY MILDEW (<i>PODOSPHAERA LEUCOTRICA</i>)	
PSOTA V.	28
USE OF MEAT AND BONE MEAL IN THE NUTRITION OF CORN FOR GRAIN	
RADA V., RYANT P.	29

EFFECT OF SULPHUR APPLICATION ON MALTING BARLEY QUALITY RADOCH T., HRIVNA L.	30
THE ENERGY INTENSITY OF DIFFERENT CULTIVATION METHODS OF WINTER WHEAT REŽO L., POSPIŠIL R.	31
ROOT SYSTEM AS A FACTOR OF OILSEED RAPE YIELD FORMATION STŘEDA T., DOSTÁL V., ULLMANNOVÁ K.	32
THE RESISTANCE OF POLLEN BEETLES (<i>MELIGETHES AENEUS</i> FABRICIUS 1775) TO PYRETHROIDS IN THE ENVIRONS OF BRNO ŠKUTOVÁ J., KOLAŘIKOVÁ E., MLÝNSKÁ J., HRUDOVÁ E., SEIDENGLANZ M., POSLUŠNÁ J., KOLAŘIK P.	33
THE FOOD PREFERENCE OF GRANARY WEEVIL (<i>SITOPHILUS GRANARIUS</i> L.) TO DIFFERENT WHEAT VARIETIES TÓTH P., HRUDOVÁ E., VEJRAŽKA K.	34
YIELD OF BIOMASS AND NUTRIENTS AT THE RENEWED PASTURE URBANOVÁ P., VESELÝ P., SKLÁDANKA J., ČÁP J.	35

Section Animal Production

INFLUENCE OF FEEDING RATION ON VALUES OF BLOOD PARAMETERS OF COWS ON FIRST LACTATION AND DAIRY COWS IN PERIOD AFTER CALVING BALABÁNOVÁ M., URBANOVÁ P., LOHNISKÝ A., ZEMAN L.	39
THE CORN SILAGE DIGESTIBILITY BY HORSES BLAŽKOVÁ K., HOMOLKA P., MARŠÁLEK M.	40
YEASTS IN DAIRY NUTRITION ČERMÁKOVÁ J., DOLEŽAL P., KUDRNA V.	41
INFLUENCE OF LACTATION SEQUENCE ON PERFORMANCE MILKS DAIRY COWS CZECH SPOTTED RACIAL BOVINE ANIMALS ČERNÝ T., CHLÁDEK G.	42
MONITORING AND ASSESSMENT OF THE NIGHT FEEDING BEHAVIOUR OF DAIRY COWS IN TWO DIFFERENT YEAR SEASONS ERBEZ M., FALTA D., CHLÁDEK G.	43
EFFECT OF FEEDING OF MOULDED MIXTURES ON GROWTH INTENSITY OF LABORATORY RATS HORKÝ P.	44
THE EFFECT OF AGE AND INTENSITY OF GROWTH UPON RETENTION OF CALCIUM IN BODY OF CHICKENS HOUSEROVÁ J., ZELENKA J.	45

THE GROWTH INTENSITY OF PHEASANT CHICKENS FATTENED WITH DIFFERENT DIETS	
HUDEČKOVÁ P., ZAPLETAL D., VITULA F., KROUPA L.	46
THE EFFECT COMPOSITION OF DIETS ON DIGESTIBILITY OF MINERALS	
JANČÍKOVÁ P., ZEMAN L.	47
THE NUTRIENTS INTAKE FROM FARM FODDERS USED FOR SUPPLEMENTAL FEEDING OF EUROPEAN BISON	
JĘDROSZCZYK R., WILICZKIEWICZ A.	48
CHANGES IN MILK YIELD AND BASIC PARAMETERS OF SHEEP MILK IN CROSSBREEDS WITH DOMINANT SHARE OF LACAUNE BREED DEPENDING ON THE STAGE LACTATION	
KONEČNÁ L., KUČTÍK J.	49
MINERAL COMPOSITION OF THE TISSUES AND THE SKELETON OF TWO SPECIES OF FISH	
KUBIZNA J., JAMROZ D.	50
ELECTROPHYSICAL PROPERTIES OF THE STALLION EJAKULATE	
MAMICA O., MÁCHAL L., SEVERA L., ŠVÁBOVÁ L.	51
THE FACTORS INFLUENCING THE NUMBER OF INSEMINATIONS NECESSARY TO FERTILIZE A MARE	
NOVOHRADSKÁ V., JISKROVÁ I.	52
EVALUATION OF PERFORMANCE HORSES IN WESTERN COMPETITIONS IN THE CZECH REPUBLIC	
PETLACHOVÁ T., JISKROVÁ I.	53
EVALUATION OF BASIC BODY MEASURES OF THE WELSH PONIES AND COBS	
PÍŠOVÁ M., JISKROVÁ I.	54
INFLUENCE OF APPLICATION OF HORMONE ON HEAT SYNCHRONIZATION AT CROSSBRED GILTS [POLISH LARGE WHITE X POLISH LANDRACE]	
PLAZAK E., GAJEWCZYK P.	55
DYNAMIC OF CHANGES OF DAILY MILK YIELD AND BASIC MILK COMPONENTS IN EAST FRIESIAN EWES DURING LACTATION	
POKORNÁ M., KUČTÍK J.	56
THE EFFECT OF TREATMENT OF MAIZE AGAINST EUROPEAN CORN BORER (OSTRINIA NUBILALIS) ON THE RUMEN DEGRADABILITY OF STARCH IN THE MAIZE SILAGE	
POŠTULKA R., DOLEŽAL P.	57
THE DYNAMICS OF OCCURRENCE OF SPERMATOZOA WITH PATHOLOGIC CHANGES AND EJACULATE QUALITY INDICATORS IN COCKEREL	
ŠVÁBOVÁ L., MÁCHAL L., SEVERA L., MAMICA O.	58

THE EVALUATION OF PROGRESS OF BODY PARAMETERS IN BELGIAN SHEPHERD GROENENDAEL AND TERVUEREN IN CZECH REPUBLIC IN 1999 – 2006	
VÁGENKNECHTOVÁ M., HOŠEK M.	59
EFFECT OF CONSERVATION ADDITIVE ON FERMENTATION PROCESS QUALITY OF BREWER GRAINS' SILAGE WITH ADDITION OF ABSORBENT HUMIDITY	
VYSKOČIL I., DOLEŽAL P., DVOŘÁČKOVÁ J., POŠTULKA R.	60
SUITABILITY OF ELAND (<i>TAUROTRAGUS ORYX</i>) FOR FULL DOMESTICATION	
ZEJDOVÁ P., KOTRBA R., CHLÁDEK G.	61

Section Agroecology

END OF LIFE TYRE – A VALUABLE RESOURCE WITH GROWING POTENTIAL	
ADAMCOVÁ D., KOTOVICOVÁ J.	65
THE APPLICATION OF PROFILE CHARACTERISTICS OF SOIL PHYSICS PARAMETERS IN ARCHEOLOGICAL RESEARCH ON THE EXAMPLE OF MIKULČICE LOCALITY	
HLADKÝ J., POKORNÝ E.	66
THE STUDY ALTERNATIVE OPTIONS TO THE PROSPECTIVE ACCUMULATION OF SURFACE WATER LOKATIONS SKRYJE	
KNIEZKOVÁ T., HUBAČÍKOVÁ V.	67
THE EFFECT OF FERTILIZATION WITH BIODEGRADABLE WASTE COMPOSTS ON FRACTIONAL COMPOSITION OF SOIL HUMUS	
KONCEWICZ-BARAN M., GONDEK K.	68
PROPOSAL OF ANTIEROSION SOIL PROTECTION IN TROSKOTOVICE CADASTRAL TERRITORY	
LIPOVSKÁ Z., TOMAN F.	69
APPLICATION LIFE CYCLE ASSESSMENT OF INDUSTRIAL FLOORS IN AGRICULTURAL PRODUCTION	
MALÝ K., KOTOVICOVÁ J.	70
BUFFERING ABILITY OF SOIL TYPES REGOSOL AND PHAEOZEMS	
MARTINEC J.	71
EFFECT OF AUTOMOBILE TRAFFIC ON MORTALITY OF SELECTED SPECIES OF MAMMALS	
MRTKA J., BORKOVCOVÁ M., VESELÝ P.	72
RURAL DEVELOPMENT SOUTHERN MORAVIA REGION UNDER THE INFLUENCE OF GLOBALIZATION	
NÁPLAVOVÁ M., NOVOTNÁ K., VAISHAR A.	73

ASSESSMENT OF WATER-SOLUBLE HEAVY METAL FORM CONTENTS IN COMPOSTED BIODEGRADABLE MUNICIPAL WASTES	
OZIMEK A., GONDEK K., KOPEČ M.	74
EUROPEAN UNION FOREST FIRES, CORRELATED WITH THE CLIMATE CHANGE	
PAULIUC E. S., PROOROCU M.	75
PHOSPHATE ACTIVITY OF MICROORGANISMS IN PLANT COMMUNITIES SOILS AFFECTED BY CLIMATE CHANGE	
PAVLÍKOVÁ D., SZOSTKOVÁ M., ZÁHORA J.	76
BIOLOGICAL AND CHEMICAL PROPERTIES OF EUTRIC CAMBISOL	
PETRÁŠOVÁ V., POSPÍŠILOVÁ L., POKORNÝ E.	77
FOCUSING OF METALS IN LIGAND FIELD STEP GRADIENT	
ŠIŠPEROVÁ E., GLOVINOVÁ E., POSPÍCHAL J.	78
DYNAMICS OF SOME HEAVY METALS CONTENT IN FUR ANIMAL EXCRETA DURING COMPOSTING PROCESS	
TABAK M., FILIPEK-MAZUR B.	79

Section Techniques and Technology

MIXING OF TWO- INGREDIENT GRAIN SYSTEM IN ROTATING AGITATOR	
BIŁOS Ł., SZWEDZIAK K.	83
MECHANICAL DEGRADATION OF ALUMINIUM ALLOYS	
DOSTÁL P., ČERNÝ M.	84
THERMAL EFFECT ON STRUCTURE OF INTERMETALLIC PHASES FE-ZN	
HORÁK K., ČERNÝ M.	85
THE PROCESSING OF BIOLOGICALLY DECOMPOSABLE WASTES IN „SBM“ TECHNOLOGY ARRANGEMENT	
JUNGA P., MAREČEK J.	86
BIOGAS TRANSFORMATION OF LIQUID SUBSTRATES	
KARAFIÁT Z., VÍTĚZ T.	87
BACTERIA DETENTION BY NANOTEXTILES	
LEV J., ČERNÝ M., KALHOTKA L.	88
HYGIENISATION OF SEWAGE SLUDGES	
MACH P., MAREČEK J.	89
USING OF PAPER SLUDGE WASTE MATERIAL, MADE OF CORRUGATED CARDBOARD AND SOLID FIBREBOARD	
SKLENÁŘ M., KOTOVICOVÁ J.	90

DYNAMICS OF THE HAY AGGREGATOR FELLA TS1602 HYDRO ŠMÍD V., BARTOŇ S.	91
RECYCLATION OF PLASTIC WASTES FROM PRODUCTION OF PVC ROOFING SHEETS ŠPAČEK I., KOTOVICOVÁ J.	92
THE DATA STRUCTURE AND ITS ELEMENTS AS GRAPHIC OUTPUT FOR GEOGRAPHIC INFORMATION SYSTEM IN THE ENVIRONMENT AND WASTE MANAGEMENT ŠTACHOVÁ Z., RYBÁŘ, R.	93
THE EFFECT OF THE LOAD OF A COMBUSTION ENGINE ON ENERGETIC AND PERFORMANCE PARAMETERS OF TRACTOR AGGREGATE TATÍČEK M., BAUER F., SEDLÁK P., ČUPERA J.	94
RESEARCH OF ANAEROBIC FERMENTATION OF ORGANIC MATERIALS IN SMALL VOLUME BIOREACTORS TRÁVNÍČEK P., VÍTĚZ T., DUNDÁLKOVÁ P., KARAFIÁT Z.	95
DIAGNOSTICS OF A HYDRAULIC PUMP STATUS USING ACOUSTIC EMISSION VARNER D., ČERNÝ M., MAREČEK J.	96

Section Food Technology

TEXTURAL PROPERTIES OF SOY MEAT ANALOGS HANZELKOVÁ Š., SIMEONOVOVÁ J.	99
EFFECT OF MALTING BARLEY STEEPING TECHNOLOGY ON WATER CONTENT HOMOLA L., HRIVNA L.	100
DRESSING PERCENTAGE AND MEAT COMPOSITION OF BROILERS FED DISTILLERS DRIED GRAINS WITH SOLUBLES HOŠKOVÁ Š., LICHOVNÍKOVÁ M., URBANOVÁ P., SKLÁDANKA J., HOŠEK M., ZEMAN L.	101
DYNAMIC CHANGE OF TECHNOLOGICAL QUALITY OF SUGAR BEET DURING GROWTH CHODUROVÁ M., HRIVNA L.	102
THE DETERMINATION OF EXTRACT IN BARLEY BY THE ENZYMATIC WAY KARÁSKOVÁ I., GREGOR T.	103
THE INFLUENCE OF GRAPE PROCESSING AND WINEMAKING TECHNIQUES ON PHENOLIC COMPOUNDS IN WINE PRODUCED FROM MALVERINA WINEGRAPE VARIETY, SOUTH MORAVIA, CZECH REPUBLIC KHAFIZOVA A., MICHLOVSKÝ M.	104

MICROBIAL CONTAMINATION OF FRUIT TEAS	
KONEČNÁ H., KALHOTKA L.	105
MICROFLORA OF KETCHUP	
KOZELKOVÁ M., KALHOTKA L.	106
MICROBIOLOGY ASPECTS SALES OF DEEP - FROZEN MILK PRODUCE	
KRUPKOVÁ D., KALHOTKA L.	107
ALPHA-AMYLASE ENZYME ACTIVITY IN MALT MADE FROM SELECTED SPRING BARLEY VARIETIES INTENDED FOR BEER PRODUCTION	
MICHNOVÁ M., EHRENBERGEROVÁ J., CERKAL R.	108
VACUUM VERSUS MODIFIED ATMOSPHERE IN STORAGE OF SAUSAGES	
MUSILOVÁ M., JŮZL M., KALHOTKA L.	109
POSBILITES OF LEADS TRANSFER IN INDIVIDUAL ANATOMIC PARTS OF POTATO (<i>SOLANUM TUBEROSUM</i> L.) CULTIVATED IN THE SOIL CONTAMINATED BY RISK ELEMENTS	
PELTZNEROVÁ L., TOMÁŠ J., SZABÓOVÁ G.	110
EFFECT OF POST-HARVEST MATURATION ON GERMINATION QUALITY OF MALTING BARLEY VARIETIES	
POLÁK O., PSOTA V., SACHAMBULA L.	111
ESTIMATION OF THE ANTIOXIDATIVE PROPERTIES OF THE NATURAL POLYPHENOLS IN THE OXIDATION PROCESS OF MODEL LIPOSOME MEMBRANES	
SIERŽANT K., GABRIELSKA J.	112
EFFECT OF PLANT EXTRACTS ON MICROBIOLOGICAL PURITY OF FENNEL (<i>FOENICULUM VULGARE</i> VAR. <i>VULGARE</i> MILL.) DURING STORAGE	
STAŇKOVÁ B., RŮŽIČKOVÁ G., KALHOTKA L.	113
THE RISK ELEMENTS CONTENT IN SOIL, SWEET CORN (<i>ZEA MAYS</i> L. <i>CONVAR. SACCHARATA</i>) AND SPINACH BEET (<i>SPINACIA OLERACEA</i>) CROPPED IN INTENSIVELY AGRICULTURAL USED AREA OF MIDDLE SLOVAKIA	
SZABÓOVÁ G., TOMÁŠ J., PELTZNEROVÁ L., ÁRVAY J.	114
PCR IN DETECTION OF FUNGAL CONTAMINATIONS IN POWDERED PEPPER	
TROJAN V., HANÁČEK P., HAVEL L.	115

Section Plant Biology

THE INFLUENCE OF STRIGOLACTONE ON AUXIN TRANSPORT	
BUCHTOVÁ D., CHMELOVÁ D., KALOUSEK P., BALLA J., PERNISOVÁ M., REINÖHL V., PROCHÁZKA S.	119

STUDY OF GENOME SIZE EVOLUTION

ČEGAN R., OBŠIVAČOVÁ V., KUBEKOVÁ H., KEJNOVSKÝ E., ŠAFÁŘ J., VYSKOT B., HOBZA R.	120
---	-----

PROTEOMIC ANALYSIS: UNCOVERING THE SIGNALING PATHWAYS IN PLANTS

ČERNÝ M., BRZOBOHATÝ B.	121
------------------------------	-----

PHOSPHOPROTEOME DYNAMICS IN RESPONSE TO CYTOKININ TREATMENT IN *ARABIDOPSIS*

DIVÍŠKOVÁ E., BRZOBOHATÝ B.	122
----------------------------------	-----

MAIZE BETA-GLUCOSIDASE ZM-P60.1 AND ITS MUTANT FORMS: NOVEL SUBSTRATE SPECIFICITIES

FILIPÍ T., MAZURA P., BRZOBOHATÝ B.	123
--	-----

MODULATION OF CYTOKININ ACTION BY DECREASED INTENSITY OF WHITE LIGHT IN *ARABIDOPSIS* – A PROTEOMIC ANALYSIS

JAJTNEROVÁ M., BRZOBOHATÝ B.	124
-----------------------------------	-----

EVALUATION OF THE ACTIVITY OF BARLEY COR/LEA GENES AFTER THE APPLICATION OF THE EXOGENOUS ABSCISIC ACID

MELIŠOVÁ L., EHRENBERGEROVÁ J., HOLKOVÁ L.	125
---	-----

IDENTIFICATION OF CANDIDATE HEAVY-METAL RESISTANCE GENES IN GENUS *SILENE*

NEVRTALOVÁ E., HOBZA R.	126
------------------------------	-----

OXIDATIVE STRESS IN *NICOTIANA TABACUM* EXPRESSING BACTERIAL IPT

NOVÁK J., BRZOBOHATÝ B.	127
------------------------------	-----

CHANGES IN GENE EXPRESSION IN TOBACCO WITH INCREASED CYTOKININ LEVEL

PAVLŮ J., NOVÁK J., BRZOBOHATÝ B.	128
--	-----

RESPONSE OF SUSPENSION CULTURE BY-2 ON PRESENCE OF ORGANIC POLLUTE

SOLNICKÁ P., KLEMŠ M., HAVEL L.	129
--------------------------------------	-----

MATHEMATICAL AND STATISTICAL ANALYSIS OF THE MAGNITUDE OF NITROGEN AS ONE OF THE NUTRIENTS OF INDUCTIONAL MEDIUM BY TUBERIZATION OF POTATO *IN VITRO*

ŠTĚPÁN Z., KLEMŠ M.	130
--------------------------	-----

BREEDING OF TRITICALE FOR BETTER BREAD-MAKING QUALITY USING DNA MARKERS

TREBICHALSKÝ A., MARTINEK P., BALÁŽOVÁ Ž.	131
--	-----

Section Animal Biology

USING OF DNA FROM DIFFERENT TISSUES OF RAPTORS (<i>FALCONIFORMES</i>) FOR STUDYING GENETIC DIVERSITY AND POPULATION STRUCTURE BRYNDOVA M., KOURKOVA L., URBAN T.	135
INBRED HORSE - A SOCIAL LOSER? EFFECT OF INBREEDING ON SOCIAL BEHAVIOUR AND SOCIAL SUCCESS IN AN INBRED POPULATION OF DOMESTIC HORSES DUBCOVÁ J., BARTOŠOVÁ J., KAŠPAR M., TYKALOVÁ R., KOMÁRKOVÁ M.	136
GENOTYPING OF <i>CLOSTRIDIUM DIFFICILE</i> FROM PATIENTS WITH SUSPECT INFECTION CDAD (<i>CLOSTRIDIUM DIFFICILE</i> ASSOCIATED DISEASE) ĎUDÁKOVÁ L., GÁLOVÁ Z., MELTER O.	137
THE IGF2 AND NAMPT GENE POLYMORPHISMS AND ASSOCIATIONS WITH PERFORMANCE TRAITS IN CZECH LARGE WHITE PIG BREED CHALUPOVÁ P., WEISZ F., KNOLL A., URBAN, T.	138
ASSOCIATION OF SINGLE NUCLEOTIDE POLYMORPHISMS IN TG, LEP AND TFAM GENES WITH CARCASS TRAITS IN CROSS-BREED CATTLE KAPLANOVÁ K., DVOŘÁK J., URBAN T.	139
MATERNAL INVESTMENT AND REPRODUCTION STRATEGY IN THE DOMESTIC HORSES (<i>EQUUS CABALLUS</i>) KOMÁRKOVÁ M., BARTOŠOVÁ J., DUBCOVÁ J.	140
EFFECTS OF GENOTYPE LEPR ON PRODUCTION TRAITS IN PIGS KOVÁČIK A., BULLA J., TRAKOVICKÁ A.	141
DETERMINATION OF DECLARED QUALITATIVE CHARACTERISTIC AND IDENTIFICATION OF ANIMAL NUCLEIC ACID IN FEEDSTUFFS NESVADBOVÁ M., VAŠÁTKOVÁ A., KNOLL A., ZEMAN L.	142
OVERWINTERING OF SPIDERS IN EMPTY LAND-SNAIL SHELLS IN XERIC HABITATS OF SOUTHERN MORAVIA NIEDOBOVÁ J., HULA V.	143
THE STANDARTIZATION OF RADIOSPECTROMETRIC ASSESMENT OF RADIOCESIUM (137CS) IN FISH <i>IN VIVO</i> IN A MODEL AQUATIC ENVIRONMENT RŮŽIČKOVÁ E.	144
DEGRADATION OF NUCLEIC ACIDS IN VARIOUS LABORATORIAL CONDITIONS SEDLÁČKOVÁ T., KNOLL A., SVOBODOVÁ K.	145
INNERVATION OF UTERINE WALL IN ASPECT OF MUSCULAR LAYER CONTRACTION IN CAT'S REPRODUCTION CYCLE SOBCZYK I., KUROPKA P., SZYSZKOWSKA A.	146

THE INFLUENCE OF PITFALL TRAPS ON THE SOIL EPIGEAL FAUNA ŠAFÁŘ J., HULA V., ŠŤASTNÁ P., VÍTKOVÁ Z.	147
ASSOCIATION BETWEEN LACTOFERRIN GENE POLYMORPHISM AND BOVINE MAMMARY GLAND INFLAMATION ŠRUBAŘOVÁ P., DVOŘÁK J.	148
IDENTIFICATION OF A POSSIBLE NEW WAP ALLELE IN A ROMANIAN LOCAL PORCINE BREED ȘUTEU M., VLAIC A., BALTEANU V., POP F., PAULIUC S.	149
GENETIC DIVERSITY IN CAUCASIAN SHEPHERD AND CZECH TERRIER DOG BREEDS USING MICROSATELLITE LOCI TRUKSA M., URBAN T., PUTNOVÁ L.	150
ATYPICAL COMMUTING FLIGHTS OF FEMALES MOUSE-EARED BAT (<i>MYOTIS MYOTIS</i>) IN THE UNDERGROUNDS OF THE „NIETOPEREK“ BAT RESERVE (WESTERN POLAND) WAWROCKA K., KOKUREWICZ T.	151
ANALYSIS OF <i>SERPINE1</i> GENE VARIABILITY IN PIGS WEISZ F., KNOLL A.	152

Section – Plant Production

POST-EFFECT OF INCREASING BOTTOM SEDIMENT ADDITIVES TO THE SUBSTRATUM ON LEAD UPTAKE BY PLANTS

Arasimowicz M., Niemiec M., Wiśniowska-Kielian B.

Department of Agricultural and Environmental Chemistry, University of Agriculture in Cracow, Al. Mickiewicza 21, 31-120 Cracow, Poland

E-mail: komorowska.monika@interia.pl

ABSTRACT

The aim of the studies was to estimate the post-effect of bottom sediment addition to the substratum on lead uptaking by the plants under the conditions of pot experiments. Very acid soil and bottom sediment dredged from Rożnów Reservoir were used for preparation of substrata. Bottom sediment share ranged between 0 and 16% of substratum mass. Tested plants were grown in orders: maize (*Zea mays* L.) and horse bean (*Vicia faba* L., var. *minor*) as well as oat (*Avena sativa* L.) and lupine (*Lupinus angustifolius* L.). The plants were harvested for green mass. The content of Pb in mineralisats obtained from plant material was determined by ICP-AES method. The total quantity of Pb removed with yield of the plants depending on species and part of the plant was compared and changes affected by bottom sediment share in substratum as well as previous plant cultivation were estimated. Under the conditions of substratum contaminated by lead significantly higher amounts of Pb were accumulated in roots than in tops of the plant. In average, the highest Pb contents were determined in lupine roots and horse bean tops, while the lowest data were found in maize roots and tops. Considering total quantity of Pb, the highest amounts were removed with yield of maize, and the lowest with yield of horse bean. The Pb translocation coefficients (TC) (content in the tops *versus* content in the roots) as well as the bioaccumulation coefficients (BC) (content in the tops *versus* content in the soil) for individual plants were calculated. The highest average value of TC was affirmed for horse bean (0.18), and the lowest one for oat (0.09). The mean values of BC for the individual plants decreased as follow: 0.11 – horse bean, 0.08 – lupine, 0.07 – oat, 0.05 – maize. With the increasing share of bottom sediment in substratum decrease of Pb accumulation in the roots of the plant was observed, while an increase of TC values was noted. Similar relation between the sediment dose and Pb content in the tops was not found. In spite of additional Pb load with applied bottom sediment, the increasing of its content in plant tissue was not stated. One possible explanation of this dependence is the decreasing of Pb availability to the plants as a result of sediment ability to the substratum alkalization.

Key words: bottom sediment, lead, plants, uptake, translocation and bioaccumulation coefficients.

THE YIELD REACTION OF MALTING BARLEY ON SULPHUR AND NITROGEN FERTILIZATION

Babiánek P., Ryant P.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: petrbabianek@seznam.cz

ABSTRACT

The objective of the two-year pot trial was to assess the effect of sulphur (S) and nitrogen (N) application on the grain and the straw yield of malting barley. There were 5 variants of sulphur fertilization: 1. control variant, not fertilised with S, 2. smaller dose of ammonium sulphate (0.2 g/pot), 3. higher dose of ammonium sulphate (0.4 g/pot), 4. smaller dose of elemental sulphur (0.2 g/pot), 5. higher dose of elemental sulphur (0.4 g/pot). Nitrogen was applied in two doses: smaller dose of 0.4 g per pot and higher dose of 0.6 g per pot. In the year 2008, the significant differences of sulphur application were ascertained in average yield of grain and straw of barley. The fertilization of smaller and higher dose of elemental sulphur with higher dose of nitrogen increased grain yield by 19% and 18% in comparison to the control variant, respectively. In the case of application of smaller dose of nitrogen, the grain yield obtained from the variants of elemental sulphur application was of 9 – 12% higher than control. The ammonium sulphate application statistically did not affect the yield of the grain in comparison to the control. The yield of barley straw was influenced by sulphur fertilization analogous to the yield of the grain. In the year 2009, although average yield followed elemental sulphur application were higher than the control and the variants of ammonium sulphate application, the sulphur fertilization had statistically insignificant effect on the grain and straw yields of malt barley. The dose of applied sulphur statistically did not affect the yield of the grain and the straw of malting barley.

Key words: sulphur, nitrogen, fertilization, malting barley

Acknowledgments: The study was funded by the “Research Centre for Study of Extract Compounds of Barley and Hop” No. 1M0570.

THE RELATION BETWEEN TEMPERATURE AND ONSET OF THE PHENOPHASES OF COMMON DOGWOOD (*CORNUS SANGUINEA* L.) DURING 1961 - 2008 IN THE CZECH REPUBLIC

Bartošová L., Žalud Z.

Department of Agrosystems and Bioclimatology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: bartolen@gmail.com

ABSTRACT

This work is based on phenological observation of three individuals of common dogwood (*Cornus sanguinea*) at one locality with three different microclimatological conditions. The premises and the aims of our work were firstly documented the relationship between onset of the phenophases and the development of the temperature in chosen months. It was supposed that the plants which were observed at the same research plot but with different microclimatological conditions (three different places with distinct insolation and shading) begin their development in relatively different time. Second aim of our work was to process the development of phenophases during year 1961 and 2008.

The phenophases of common dogwood (*Cornus sanguinea*) of the first flower and full flowering on locality Lednice and Vranovice (these two plots differ relatively little in amount of precipitation and in values of temperature) in flood plain forests since 1961 till 2008 were observed. On research plot Vranovice were observed the phenophases at three different places (in insulated place, in shaded place and on the interface between forest and meadow) by the phenocamera and the values of air temperature (at two elevations) during one year 2009 were measured.

The daily meteorological data for the period 1961 – 2008 were homogenized and interpolated for each plot by ProClimDB software package. Subsequent statistical values were calculated by software AnClim.

The results show the relation between temperature and onset of the phenophases during whole time of observation and the phenophases has advanced to the earlier time by almost 14.0 days. The start of the phenophases of three individuals of common dogwood at plot Vranovice differs in the dependence on the process of the temperature and the rate of the insolation.

Key words: phenology, temperature, *Cornus sanguinea* L., climate change

Acknowledgements: We gratefully acknowledge the support of the 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 VEGETATION PERIOD ON THE NUTRIENT COMPOSITION OF ALFALFA

Dvořáčková J., Doležal P.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xdvorac2@node.mendelu.cz

ABSTRACT

The aim of this work was to find the growing stage of lucerne stand with the optimal composition of all important nutrients (carbohydrates, crude protein, fiber ect.). The samples were taken in the company farm Velké Opatovice, the nutrients were determined by the methods prescribed by given standard.

Our monitoring consisted of two parts. The first was the weekly sampling. This monitoring took place during the period of vegetation and the task was to provide the detail information about the development of controlled quantities of the nutrients. In the second monitoring, the samples of alfalfa at the different growth stages (very young stands, young stands, beginning bud-stage, bud-stage, beginning of flowering and after flowering) were taken.

After the evaluation of the results, we concluded that the most appropriate stage for the harvesting of this crop is bud-stage where all the nutrients were in the optimal ratio.

Key words: lucerne, vegetation periode, nutrient, carbohydrates, crude protein, fiber

THE COMPARISON BETWEEN THE EVAPOTRANSPIRATIONS OF SHORT ROTATION COPPICE AND THE REFERENCE GRASSY SURFACE

Fischer M., Žalud Z.

Department of Agrosystems and Bioclimatology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: fischer.milan@gmail.com

ABSTRACT

Within a presented study a seasonal and daily dynamics of actual evapotranspiration was investigated in poplar short rotation coppice culture (SRC) and was also compared with the evapotranspiration of grassy reference surface. The main aim of the overall study is to find a correlation between the basic meteorological inputs and the yields of biomass and to create a model which will be able to choose suitable areas for growing of SRC and to predict their yields. Very important part of such accessing is the evaluation of water balance – especially rains, evapotranspiration and soil moisture patterns. To measure the evapotranspiration, two Bowen ratio systems were constructed above SRC and the reference surface in the summer 2008. The high-density experimental field plantation for the verification of the performance of poplar clone J-105 (*P. nigra* x *P. maximowiczii*) is situated in Domanínek (Czech Republic, 49°32' N, 16°15' E and altitude 530 m) and was established in the spring 2002 on agricultural land previously cropped predominantly for cereals and potatoes.

During the observed period the daily and monthly sums of evapotranspiration in different growths were compared. The SRC showed higher values of the evapotranspiration in the course of months with the highest rains – June and July. When a longer period without rains and lower soil moisture came, evapotranspiration of SRC decreased more than the reference and at that time the grassy surface reached higher values. Generally the highest evapotranspiration rate was recorded in the days with occurrence of rains in combination with high solar radiation. In these cases especially culture of SRC attained to highest evapotranspiration amounts. The divergence in such days could be explained with larger leaf area index of poplars and so with considerable ability to transpire. In addition, leaf area of poplars can catch much more water from precipitations (interception) which can be consequently evaporated. With due regard to soil water deficit, our results indicate that poplars culture compared to reference turf grass is much more sensitive to this type of limitation. The results of this work confirm the well known pivotal role of solar radiation and sufficiency of soil water in evapotranspiration rate.

Key words: short rotation coppice, reference grassy surface, evapotranspiration.

Acknowledgements: The presented study was supported by In-house Grant Agency at MUF in Brno (IGA 14/2009) and by the Research plan No. MSM 6215648905 “Biological and technological aspects of the sustainability of controlled ecosystems and their adaptability to climate change“ financed by the Ministry of Education, Youth and Sports of the Czech Republic.

EFFECT OF SULPHUR NUTRITION ON THE NUTRITIONAL VALUE OF BROCCOLI

Franková M., Ryant P.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xfranko3@node.mendelu.cz

ABSTRACT

The aim of this experiment was to find out how quantitative and qualitative parameters of broccoli will be influenced by the different dosages and forms of sulphur. In the experiment with 40 broccoli plants, 2 forms (ammonium sulphate – SA, elementary sulphur – ES) and 5 dosages of sulphur (control, SA1, SA2, ES1, ES2) were applied to the soil in Mitscherlich pots. Broccoli grown between 2 June and 15 September 2008 was consequently harvested and then, the analysis of the weight of head, the diameter of head, the weight of leaves and stalk, the content of nitrates, the content of proteins, sulphur and minerals was carried out. It was found out, that the weight and the diameter of overhead part of the broccoli after the fertilization by sulphur were statistically significantly different from the control, thus unfertilized variant. Especially in sulphated sulphur, the yields were higher, but not always statistically proven. Statistically significant difference was between control and the other variants in that way that the fertilization by sulphur reduced nitrates by fertilized variations. Total content of proteins in green matter was not proven. Statistical evaluation of sulphur content has proven significant differences between the control and the other variants, the fertilization by sulphur raised their content in broccoli. Setting of potassium and magnesium proved that lower yield of the weight of heads and leaves with stalk relate to higher concentration of the plant nutrient. In content of calcium in green matter haven't been seen any changes between the variants of the fertilization by sulphur. In content of phosphorus we can see the decrease of the variant ES2 opposite of control variants. Among the other variants, statistically significant difference hasn't been proven.

Key words: broccoli, sulphur, minerals in green matter, proteins.

THE REACTION OF SUNFLOWER (*HELIANTHUS ANNUUS L.*) ON DIFFERENT DOSES OF N FERTILIZATION AND THEIR APPLICATION DATES

Galliková M., Kováčik P.

Department of Agrochemistry and Plant Nutrition, Faculty of Agrobiological and Food Resources, Slovak University of Agriculture, A. Hlinku 2, 949 76 Nitra, Slovakia

E-mail: M.gallikova@centrum.sk

ABSTRACT

The one year nutritional experiment with the application of different levels of N fertilizations on Sunflower (variety PR64H41) was established in locality Veľké Rípiňany with 6 different variants of the trial (1. 0 kg.ha⁻¹, 2. 102 kg.ha⁻¹, 3. 82 + 20 kg.ha⁻¹, 4. 64 kg.ha⁻¹ 5. 44 + 20 kg.ha⁻¹ 6. 44 + 0 + 20 kg.ha⁻¹). The aim of this experiment was to find out the influence of different doses N fertilization and their application date on the yield, the thousand seeds weight and the content of oil.

The maximum yield and thousand seeds weight have been achieved when respecting the N_{an} supply before sowing of sunflower in the soil of 0.0 – 0.6 m by condition of 100% usage of Nan from the specific layer by the N amount calculation and applying the specific dose as one single application. Maximum oil content in the seeds of sunflower has been achieved by the application of the specific dose separately in two dates (before sowing and in growing phase BBCH 34-38). The higher doses of natrium (102 kg.ha⁻¹) achieved lower yield of sunflower seeds, the thousand seeds weight and the oil content comparing to lower doses of natrium (64 kg.ha⁻¹).

Key words: sunflower, nitrogen, yield, thousand seeds weight, oil contents

TESTING OF BIOLOGICAL SUBSTRATES FOR ANAEROBIC DEGRADATION

Hodoval J., Pulkrábek J.

Department of Crop Production, Faculty of Agrobiolgy, Food and Natural Resources, Czech University of Life Sciences, Suchbát, 165 21 Prague, Czech Republic

E-mail: hodoval.jan@seznam.cz

ABSTRACT

We tested the methanogenic activity of 10 substrates (maize silage, alfa-alfa and clover silage, potatoes, wheat straw, barley straw, rape straw, foliage wastes, sugar beet wastes and draff). For all substrates, the theoretical content of methane and the maximal yield of methane were quantified. In the substrate prior to digestion and in digested matter the content of organic matter, the content of lignin and the content of ash were measured. The measurements were carried out on Biological degradation device. Our results showed that for the production of biogas the best substrates are lucerne silage, trifolium silage and sugar rape. Both parameters, the dissolubility and the production of biogas were considerable good.

Key words: biogas, digestat, fermentation

Acknowledgments: MSM 6046070901

OCCURRENCE OF *FUSARIUM* SPP. ON THE CORN KERNEL (*ZEA MAYS* L.)

Kmoch M., Šafránková I.

Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkmoch@mendelu.cz

ABSTRACT

The aim of the study was the incidence and representation of individual species *Fusarium* fungi and their determination on hybrids kernels and versions of Bt-corn hybrids grown in different production areas in the Czech Republic (CR) in 2008. In CR corn (*Zea mays* L.) is grown mainly for silage and grain as feed for livestock. Among the major pathogens of corn is *Fusarium* fungi that cause rot of collar emergence plants and straw and cob rot. Some *Fusarium* species are important producers of mycotoxins and with the toxic and carcinogenic potential negatively affecting the health of animals and humans. From areas with a high proportion of corn in crop rotation was obtained 45 samples (22 hybrids and 7 versions of Bt-hybrids - genetically modified corn). From the area Čejč (District Hodonín) 25, Medlov (District Olomouc) 6, Otrokovice-Kvítkovice (District Zlín) 6, Loštice (District Šumperk) 4 and the Jiřice u Miroslavi (District Znojmo) 4. Kernels were disinfected on surface (60 sec, 5% sodium hypochlorite), then twice rinsed with distilled water and placed in petri dishes (PM) on potato-dextrose agar (PDA), each 10 pcs/PM, 5 repetitions. Incubation was by room temperature. Isolation of pathogens from kernels was made from 4th to 7th day and then was growing pure cultures for identification. Statistical evaluation of the frequency isolates was performed by using single factor analysis of variance and multiple comparison (Tukey-HSD, $\alpha = 0.05$) with help of the program UNISTAT 5.1. On the total number of pathogens (997 isolates) were involving *Fusarium* species 41.3% (412 isolates). Differences in the frequency isolates of fungi genus *Fusarium* in the frame of hybrids, the Bt-hybrids and hybrid versions of a given site were statistically conclusive only to the locality Čejč and Loštice among several samples. Differences between sites in the number isolates of species genus *Fusarium* occurring on individual hybrids were mostly statistically demonstrable. A higher effect on attack fungi caryopsis *Fusarium* had, in the most cases, locality than hybrids of Bt-versions of hybrids. The highest representation, i.e. 47.1% was observed by species of *Fusarium subglutinans* (*Gibberella subglutinans*), *F. verticillioides* (*Gibberella moniliformis*) – 35.3% and 14.5% for *F. graminearum* (*Gibberella zeae*). The representation of other species was very low (*F. poae* – 1.7%, *F. avenaceum* (*Gibberella avenacea*) – 1.0% and *F. culmorum* – 0.5%).

Key words: *Fusarium* spp., corn

Acknowledgments: The research project was funded by the Internal Grant Agency, Mendel University of Agriculture and Forestry in Brno number IG290061.

ASSESSMENT OF REDUCED DOSES EFFICACY OF GLYPHOSATE BY CHLOROPHYLL FLUORESCENCE MEASUREMENT

Kocurek V., Smutný V.

Department of Agrosystems and Bioclimatology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: vojtech.kocurek@seznam.cz

ABSTRACT

The aim of this work was to assess herbicide efficacy of reduced doses of herbicide 'Roundup klasik' with active ingredient glyphosate by measuring chlorophyll fluorescence compared to standard methods of assessing. FluorCam device was used for own measurement and three often used doses were tested. Registered 100% dose (3.00 l.ha⁻¹) and two reduced doses 75% (2.25 l.ha⁻¹) and 50% (1.50 l.ha⁻¹). Experimental plants of redroot pigweed (*Amaranthus retroflexus*) were grown in controlled laboratory conditions to stage of four right leaves and than treated by herbicide. Measurements were carried out in 0, 1, 2, 3, 6, 9 and 15 days after treatment (DAT). Fluorescence parameter called Quantum yield (QY) was selected for the assessment of herbicide efficacy by FluorCam device. Achieved results were compared with subjective assessment and growth parameters.

The obtained results showed that we are able to detect significant differences and the effect of selected herbicide by chlorophyll fluorescence measurement. We can detect significant difference in QY values compared to control variant in 2-DAT for all variants, for subjective assessment in 1-DAT. Statistically significant difference for QY values between 100% and other doses occurred in 3-DAT, for subjective assessment in 2-DAT. Final effect of herbicide was the same for all doses, 100% of weed plants died. Correlation coefficient between QY values and subjective assessment was 0.93 what means strong correlation and resemblance in results assessed by these two methods.

Key words: herbicide efficacy, chlorophyll fluorescence, fluorcam, glyphosate

Acknowledgements: This study was supported within project No. 2205 - Innovation of herbology subject by visualization of the effects affecting the application of herbicides which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

THE ROOT SYSTEM CAPACITY DEVELOPMENT IN RELATION TO NUTRITION AND FERTILIZATION AND TILLAGE METHODS CONCERNING THE AMOUNT OF GRAIN PRODUCTION OF SPRING BARLEY

Kupecsek A., Molnárová J.

Department of Crop Production, Faculty of agrobiology and food resources, Slovak university of Agriculture in Nitra, A. Hlinku 2, 949 76 Nitra, Slovakia

E-mail: andrej.kupecsek@uniag.sk

ABSTRACT

The aim of the study was to monitor the development of the root system capacity (RSC) in relation to nutrition and fertilization and tillage impact on the amount of grain production of spring barley. The task was solved using polyfactorial field trials in agroecological conditions of warm corn production area in Slovakia in 2009. We monitored four spring barley varieties, two tillage methods, four variants of nutrition and fertilization. The RSC measurements were done using the LCR – meter in growth stages of BBCH 13 – 15; 23 – 25; 51; 85 – 89. Achievements were statistically evaluated in the program package Statistica 8. The results affirmed a positive correlation relationship between grain yield and fertilization ($r = 0.44^{***}$). Due to the different types of the fertilization the highest values of the RSC were found at the variant with saltpetre nitrate with limestone. Conventional tillage had a favourable impact on RSC till the growth stage of tillering (BBCH 23-25) by all observed varieties, which also statistically affected the grain yield. The varieties were characterized by different RSC. The results showed that the highest RSC did not achieve the highest grain yield.

Key words: spring barley, nutrition and fertilization, tillage methods, root system electrical capacity, grain yield

Acknowledgments: Paper was elaborated due to financial support from VEGA 1/0551/08.

EFFICACY COMPARISON OF CONVENTIONAL AND ORGANIC FUNGICIDAL SYSTEMS AGAINST POWDERY MILDEW (*PODOSPHAERA LEUCOTRICHA*)**Psota V.**

Department of Zoology, Fisheries, Hydrobiology and Apiculture, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: vaclav.psota@mendelu.cz

ABSTRACT

Organic (sulphur, lime-sulphur, copper hydroxide, aluminium sulphate, sodium bicarbonate) and conventional (copper hydroxide, pyraclostrobin, dithianon, sulphur, fluquinconazole, pyrimethanil, thiram, trifloxystrobin, difenoconazole) fungicidal systems were compared in terms of apple powdery mildew (*Podosphaera leucotricha*) infection in the Czech Republic (south Moravia). The trial has been done according to EPPO 1/69(2) method on apple variety Idared during spring and summer 2009. Secondary powdery mildew infection level was evaluated according to 4-scale graduation (1= no mildew, 4 = over 50% of leaf covered by mildew). During the first evaluation (May 19) secondary infection reached following levels 1.68 (conventional system) and 2.17 (organic system). During the second evaluation (June 17) secondary infection reached following levels 1.87 (conventional system) and 2.25 (organic system). The difference between systems was statistically high significant.

Key words: apple, powdery mildew, organic agriculture, conventional agriculture, *Malus domestica*

USE OF MEAT AND BONE MEAL IN THE NUTRITION OF CORN FOR GRAIN

Rada V., Ryant P.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xrada@node.mendelu.cz

ABSTRACT

Meat and bone meal (MBM) is known since first quarter of 20th century. It is made in veterinary manufacture from animal by-product. After the using of MBM as feed was forbidden, there is an alternative to use MBM like organic fertilizer for agricultural crops. In 2007 and 2008, the effect of the fertilisation by meat and bone meal on the yield and quality of corn was observed. Then was watched the influence of the application of MBM on agrochemical properties of the soil. The experiment included 4 alternatives of MBM: 1. control unmanured, 2. low amount 1 t.ha⁻¹, 3. medium amount 2 t.ha⁻¹ and 4. high ration amount 4 t.ha⁻¹. In both harvests the yield of crops and its quality were evaluated. The statistical impact was proved by the fertilising by meat and bone meal for the yield of crops of corn, when in second year, the yield was higher in comparison with the control at 18.7% with 1 t.ha⁻¹, at 42.4% with 2 t.ha⁻¹ and at 65.5% with 4 t.ha⁻¹. The other impact was put on the content of amyloid and ash in the corn. With remaining amount of MBM it was proved the dropping exchange soil relation and the growing content of phosphorus level in the soil. The fertilisation by MBM had statistically very high significant impact on the growing content of mineral nitrogen in the soil. The control variant had 8.73 mg.kg⁻¹ of mineral nitrogen, whilest variant MBM 4 t.ha⁻¹ was of 176% higher (24.10 mg.kg⁻¹ of soil). In the end we can say that application of meat and bone meal improves and increases yield, increases the content of soil phosphorus and mineral nitrogen without any negative impact on the content of certain heavy metals in soil.

Key words: meat and bone meal, fertilization, corn, yield, qualitative parameters.

EFFECT OF SULPHUR APPLICATION ON MALTING BARLEY QUALITY

Radoch T., Hřivna L.

Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xradoch@mendelu.cz

ABSTRACT

In 2005-2008 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 nitrogenous fertilisers on yields and technological parameters of barley grain. The weather conditions of the year considerably affected yields and technological parameters of grain.

The application of nitrogenous fertilisers with sulphur in dose of 30 kg.ha⁻¹ N and 50 kg.ha⁻¹ N increased grain yields by 4.0% and 2.1%, respectively, compared to variants without sulphur. Decreased dose of N in combination with sulphur made the content of starch going down in average for 0.17%. Other way by increased dose of N the sulphur helps the content of starch going up for 0.43%. Fertilizing with N and S decreased content of N substance in seed for 0.1%, by contrast combination of increased N and sulphur conducted to grow of 0.06% against non sulphur fertilized variety.

Key words: barley, fertilisation, nitrogen, sulphur, quality

THE ENERGY INTENSITY OF DIFFERENT CULTIVATION METHODS OF WINTER WHEAT

Režo L., Pospíšil R.

Department of Crop Production, Faculty of Agrobiological Sciences, Slovak University of Agriculture in Nitra, A. Hlinku 2, 949 76 Nitra, Slovakia

E-mail: Ladislav.Rezo@uniag.sk

ABSTRACT

The work deals with the evaluation of energy efficiency of cultivation of winter wheat in the used of different production technologies. In the experiment were included three tillage methods: conventional, reduced and minimization. For each tillage method, we applied a variant without fertilization, rational (balance), balance fertilization to expected yield and balance fertilization with incorporation of remains after harvest. The highest energy gain ($223.08 \text{ GJ}\cdot\text{ha}^{-1}$) and the highest energy efficiency (22.53) we have the minimization method of tillage. The lowest energy gain ($181.28 \text{ GJ}\cdot\text{ha}^{-1}$) and low energy efficiency (17.39) were recorded in conventional tillage method.

Key words: winter wheat, tillage, fertilization, energy balance

ROOT SYSTEM AS A FACTOR OF OILSEED RAPE YIELD FORMATION

Středa T., Dostál V., Ullmannová K.

Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: streda@mendelu.cz

ABSTRACT

During the vegetation the crops are influenced by numerous of the factors which may cause a stress. In recent years, the main stress factor is a lack of water in the soil. To elimination the water scarcity in the soil the plants need to have a sufficiently developed root system that is able to receive the optimal amount of water and nutrients. Abroad, the root system is studied in detail and is the main aim of breeding programs, particularly in relation with predicted climate change. In the experiments at Department of Crop Science, Breeding and Plant Medicine of MUAFA in Brno the size of the root system through its electrical capacity in relation to the yield and quality of winter rape and cereals varieties is evaluated. The experiments with nine varieties were established in 2008 in Opava. The size of the root system was measured three times during the growing period with the apparatus LCR Meter ELC 131 D. The differences in the size of the root system between varieties in single terms of measurement were found. In the experimental year negative correlation between the root system size and yield of winter rape were found. This influence could be explained by the fact that the water stress did not occur during the vegetation. The varieties with bigger root system consumed more nutrients for root creation, without its using to obtain water and nutrients. The assimilates invested in the roots could not be used to create an yield.

Key words: root system size, oilseed rape, yield, electric capacity

Acknowledgments: This paper was supported by project MEB060811 “Root System as a Factor of Yield Formation and Quality of Barley and Oilseed Rape”.

THE RESISTANCE OF POLLEN BEETLES (*MELIGETHES AENEUS* FABRICIUS 1775) TO PYRETHROIDS IN THE ENVIRONS OF BRNO

Škutová J.¹, Kolaříková E.¹, Mlýnská J.¹, Hrudová E.¹, Seidenglanz M.², Poslušná J.², Kolařík P.³

¹Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²AGRITEC, Research, Breeding & Services, Sumperk, Czech Republic

³Research Institute for Fodder Crops, Zahradni 1, 664 41 Troubsko, Czech Republic

E-mail: xskutova@node.mendelu.cz

ABSTRACT

The results of pollen beetle pyrethroids resistance tests in 2009 year are given. The testing population of pollen beetles (*Meligethes aeneus*) came from environs of Brno, total of 12 locations.

For testing of in successive steps rising doses (rates: 0%, 4%, 20%, 100% = European registered dose 7.5 g.ha⁻¹, 500%) of insecticides the adult-vial-test (Met. 11, IRAC) was used. As referential active ingredients *Lambda-cyhalothrin* (the active represents esteric pyrethroid group, type II). We worked with analytical samples of the actives and with their solutions in acetone. Contact effects were assessed after 1, 5 and 24 hours.

Key words: oilseed rape, pollen beetles, resistance, pyrethroids

Acknowledgments: Supported by the Ministry of Agriculture of the Czech Republic, Project No. QH 81218.

THE FOOD PREFERENCE OF GRANARY WEEVIL (*SITOPHILUS GRANARIUS* L.) TO DIFFERENT WHEAT VARIETIES

Tóth P.¹, Hrudová E.¹, Vejražka K.²

¹Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Research Institute for Fodder Crops, Zahradni 1, 664 41 Troubsko, Czech Republic

E-mail: Drumi@atlas.cz

ABSTRACT

The aim of this work are food preferences of granary weevil (*Sitophilus granarius*) to different varieties of wheat and evaluation of influence such as harvest year, growing locality and inner structure of grain palatability for granary weevils.

These varieties were used for food preference evaluation: Akteur, Clarus, Cubus, Darwin, Eurofit, Florett, Globus, Hedvika, Ludwig, Meritto, Rheia, Samanta, Sulamit and Svitava. The artificial infestation was used in experiment. The 50 randomly chosen specimens of weevils were used for each variant. The weevil population development according to growth of weevils number, the living rests as well as grains weight was evaluated 40, 70 and 100 days after infestation. We observed different variety preferences in our trial. The harvest year, growing locality and wheat variety had influence on palatability of grain for grain weevils.

Key words: Storage pests, stocks, granary weevil (*Sitophilus granarius*), winter wheat, grain quality

Acknowledgments: These results were supported by project no. MSM2629608001.

YIELD OF BIOMASS AND NUTRIENTS AT THE RENEWED PASTURE

Urbanová P.¹, Veselý P.¹, Skládanka J.¹, Čáp J.²

¹Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Agency for Nature Conservation and Landscape Protection of the CR, Kotlarska 51, 657 20 Brno, Czech Republic

E-mail: petra.urbanova@mendelu.cz

ABSTRACT

The aim of the study was to estimate the production of plant biomass of a test pasture and its nutritional values. This was realized in 2008 on the 6 ha pasture. The pasture was situated in the area of the "Drahanska Highlands" in the altitude of about 500 - 520 m. Since 2008, the part of the pasture grazed, another part moved. Two different biotopes for taking the samples were chosen to be able to assess the role of both production and non-productive grasslands. There were habitat with majority of graminoids (*Poa pratensis*, *Festuca pratensis*, *Dactylis glomerata*, *Trisetum flavescens* and *Cynosurus cristatus*) and habitat of common bentgrass with the majority of the herbs on the fallow land (*Agrostis capillaris*, *Hypericum perforatum* L., *Dianthus carthusianorum* and *Hieracium pilosella*). The productivity of grassland and nutrient composition from the samples collected from the yield's fences (4 m²) were evaluated. There were different fellings depending on productivity (graminoid's habit with 4 cuts, herb's habit with 3 cuts). These were taken in May, July, August and October. After the drtyny, the collected samples were tested for the quantity of dry matter, the fiber, the crude protein, the fat and the ash. Total yield of the biomass of the graminoid's habitat was 3 645 kg of dry matter per hectare and the herb's habitat 1 825 kg of dry matter per hectare. Higher crude proteins content was expressed in the habitat with grass community. Regarding this fact, higher content of non nitrogen extracted matter in habitat with a higher proportion of herbs was found.

Key words: production of biomass, nutrients

Acknowledgments: This work was prepared with the support of the Research project No. MSM6215648905 " Biological and technological aspects of sustainability of controlled ecosystems and their adaptation to climate change " granted by the Ministry of Education, Youth and Sports of the Czech Republic.

Section – Animal Production

INFLUENCE OF FEEDING RATION ON VALUES OF BLOOD PARAMETERS OF COWS ON FIRST LACTATION AND DAIRY COWS IN PERIOD AFTER CALVING

Balabánová M., Urbanová P., Lohniský A., Zeman L.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xbalaba1@node.mendelu.cz

ABSTRACT

We would like to find out if there are appreciable level differences of blood parameters between cows on first lactation and dairy cows in the case that they receive the same food ration.

We analysed only ten blood parameters. They were triglycerides (TG), amylase, gamma glutamyltransferase (GGT), alkaline phosphatase (ALP), bilirubin, urea, haemoglobin, glutamate pyruvate transaminase (GPT, alanine aminotransferase), glutamate oxaloacetate transaminase (GOT, aspartate aminotransferase) and glucose

Our experiment was realized on school agricultural farm Žabčice. We had 11 cows of Holstein breed for our observation (5 cows on first lactation and 6 cows on third lactation) in time after calving (7 days after). We took blood to test tube with lithium heparin from *vena caudalis mediana*. These specimens were analysed by Reflovet Plus at laboratory of Mendel University.

During our observed, there were found to be exceeded physiological limits three-times. They were cases of TG, level of bilirubin and level of glucose. Physiological interval of TG is 0.17 - 0.51 mmol/l (cows had 0.8 mmol/l and cows on 1st lactation had 1.032 mmol/l), physiological limit of bilirubin is 8.6 µmol/l (cows had 13.38 µmol/l and cows on 1st lactation had 9.56 µmol/l). Higher values than normal are sign of dystrophy of liver, hepatic failure or icterus hemolyticus. Physiological interval of glucose is 3.5 - 5.8 mmol/l (cows had 2.71 mmol/l, cows on 1st lactation had 3.39 mmol/l).

Others limits were adhered. Physiological limit of GGT is 0.77 µkat/l, we do not afraid of cholestasis, because cows had 0.430 µkat/l and cows on first lactation had 0.361 µkat/l. Physiological limit of urea is 7.7 mmol/l (cows had 3.90 mmol/l and cows on first lactation had 3.52 mmol/l). Physiological interval of haemoglobin is 5.6 - 8.7 mmol/l (cows had 7.38 mmol/l and cows on first lactation had 7.01 mmol/l), physiological limit of GPT is 0.7 µkat/l (cows had 0.288 µkat/l and cows on first lactation 0.231 µkat/l) and physiological limit of GOT is 3.48 µkat/l (cows had 1.84 µkat/l and cows on first lactation 1.83 µkat/l).

Key words: cow, cows on first lactation, blood parameters

Acknowledgements: Financial support from grant IG 290091 DP10/2009 is greatly acknowledged.

THE CORN SILAGE DIGESTIBILITY BY HORSES

Blažková K.¹, Homolka P.¹, Maršálek M.²

¹Institute of Animal Science, Prague-Uhrineves, Czech Republic

²Faculty of Agriculture, University of South Bohemia in Ceske Budejovice, Czech Republic

E-mail: blazkova.katerina@vuzv.cz

ABSTRACT

Four mares were used in experiments to determine *in vivo* dry matter (DM) digestibility of corn silage and to evaluate the new *in vitro* system, DAISY^{II} incubator, to determine nutrient compound of corn silage. Horses were fed thrice daily at the amount 20 kg corn silage per day. All the diets, refusals and faecal samples were collected. Samples were analyzed for contents of DM, crude protein (CP), crude fiber (CF), organic matter (OM), crude fat, neutral detergent fiber (NDF) and acido detergent fiber (ADF). Further, faecal samples were taken from each horse to form inoculum. Forty nylon bags (0.25g corn silage) were placed in each vessel, and *in vitro* fermentation was carried out for 48 h to determine DM, CP, CF, OM, crude fat, NDF a ADF. Partial results from Exp. I indicated that nutrients composition of corn silage corresponding with previous determination of other authors. The estimation of DM and OM digestibility is comparable only with data for ruminants, which showed that horses have lower DM and OM digestibility of corn silage than ruminants. Probably this caused the fact that the ruminants have better digestion apparatus. *In vitro* method is still analyzed.

Key words: horses, digestibility, corn silage, *in vitro* system,

Acknowledgments: Supported by the Ministry of Agriculture of the Czech Republic (Project MZe 0002701404) and the Ministry of Education, Youth and Sports of the Czech Republic (Project MSM 6007665806).

YEASTS IN DAIRY NUTRITION

Čermáková J.^{1,2}, Doležal P.¹, Kudrna V.²

¹Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Institute of Animal Science, Pratelstvi 815, 104 00 Praha Uhrineves, Czech Republic

E-mail: xcerma19@node.mendelu.cz

ABSTRACT

The objective of this study was to evaluate the effect of yeast culture *Saccharomyces cerevisiae* in dairy nutrition. First the effect of the graduated dosing (0, 0.4, 0.6, 0.8 g) of the yeast culture on the in vitro digestibility of maize silage, lucerne silage and total mixed feed rations both in a rumen fluid and by a pepsin-cellulase method was studied. In laboratory experiments carried out no significant effect of the addition of yeast culture on in vitro digestibility of corn silage, lucerne silage and TMR was shown ($P > 0.05$).

Next the effect of the supplementation of two different yeast strains *Saccharomyces cerevisiae* in a diet on the milk yield, milk composition and health state of high producing dairy cows was examined. The 24 lactating dairy cows were allocated into three well balanced groups. Cows in the first experimental group were fed a supplement Biosaf Sc47 (“B”), cows in the second experimental group received a supplement Levucell 1020 (“L”) and the last group of the cows was a control group (“K”) without any supplementation of yeasts. All cows were fed a total mixed ration „ad libitum”. Dry matter intake, daily milk yields and the milk composition were recorded during the experiment. Although the addition of direct-fed yeast cultures in the ration of dairy cows did not increase the dry matter intake, there was a positive effect of yeasts on the increased daily milk yields when the group L produced in the average about 1.12 kg milk/day and the group B about 0.73 kg milk/day more than cows in the control group K ($P < 0.05$). On the other hand, the feeding of yeast cultures significantly ($P < 0.05$) decreased the milk fat content. Preferable seemed the yeast strain Sc1020, because cows fed the strain Sc1020 produced more milk, plus higher milk fat and protein to compare with cows receiving supplement Sc47. Differences between experimental groups however, were not statistically conclusive ($P > 0.05$). The addition of yeast cultures led to increased activity of cellulase in the rumen ($P < 0.05$). But there was no significant effect on the other observed physiological reference values in the rumen fluid and a blood serum.

Key words: yeast culture, rumen digestion, milk production, *in vitro*

Acknowledgments: This study was supported by the Research plan No. MSM 6215648905 „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 by NAZV, The Czech Republic, as the project No. 1G46086.

INFLUENCE OF LACTATION SEQUENCE ON PERFORMANCE MILKS DAIRY COWS CZECH SPOTTED RACIAL BOVINE ANIMALS

Černý T., Chládek G.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Czech republic

E-mail: xcerny02@mendelu.cz

ABSTRACT

This work above all deal with owing to sequence lactation on performance milks near dairycows Czech spotted racial bovine animals.

Evaluation is conducted by near one's breeder double type different stable K - 166 a K - 360. Was analysed quantity milks on first, second plus third lactation from two already mentioned stable. To the rate with one another were to be arrange individual lactation first and second, first plus third. Data was extract from in-and-out card dairycows. For the purpose of analysis were chosen all female individuals that concluded standardized lactation i. e. 305 days on minimally two lactation. On the whole was included to the gathering 424 dairycows plus 1135 lactation.

Influence of sequence lactation on milk performance is essential especially juxta ratam 1:2 lactation and 1:3 lactation. In stable to K-360 here disply manifest general drift, that the dairycow on the average always raised efficiency in higher lactation compared to lactation previous, except by a few extract that an average high milk performance on previous lactation wasn't able this performance repeat or raisen. In those stable notably raisen performance of milk production amongst lactation. Namely: among 1. and 2. come to mark - up about 832 kg milks plus among 1. plus 3. about 1194 kg milks. In stable to K-166 was general tendency somewhat different. Much more often here happened to fall efficiency on resulting lactation if was previous lactation above - average in kg milks. However here too to stand on record expressive rise average performance milks on resulting lactation. Namely: among 1. and 2. about 839 kg milks plus among 1. and 3. about 878 kg milks. Growth performance milks among first and second lactation is in both stable almost coincident. However among first and third lactation noted stable K-360 higher growth. Records infer, that maximal demands on dairycow should not be required at once in first lactation, but rather be satisfied with first - lower lactation plus consequently escalate requirements overleaf and next lactation. As well as premature imposition first-calf cow at once along first lactation on the ground of starvation wages performance milks seems violent to me. Dairycow along first lactation yet complete their own growth, thus cannot quite maximize milks performance

Key words: lactation, milk yield, dairy.

MONITORING AND ASSESSMENT OF THE NIGHT FEEDING BEHAVIOUR OF DAIRY COWS IN TWO DIFFERENT YEAR SEASONS

Erbez M., Falta D., Chládek G.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Czech Republic

E-mail: miljanerbez@gmail.com

ABSTRACT

Heat load impairs feed intake and milk production of dairy cows (Moody *et al.*, 1968; Berman *et al.*, 1985). Brosh *et al.* (1998) suggested that, in hot weather, feeding cattle at night might reduce the heat load imposed upon them by their increased heat production during the hours following a meal because this increased production is complemented by decreased heat output at other times of the day. Hence, animals would produce less metabolic heat during daytime and more during the cooler night hours. The objective of this research was to compare feeding night behaviour of Czech Pied cattle dairy cows in two different year season. Group was completely monitored with two outdoor network cameras VIVOTEK technology (IP7330 and PZ6122). Our assessment hypothesis was that captured cows standing in feeding area with the head on feeding channel in monitored hours was actively feeding. Statistically the highest difference was found in number of feeding cows in 04:00 a.m. on behalf of autumn period (2.08 cows) or 181 % higher, where we found $p < 0.057$. Between other assessed periods we didn't find any higher difference. In average, the percentage of feeding cows during assessed night hours was higher in autumn period, than the summer.

Key words: network camera, season, dairy cows, night feeding, summer and autumn

Acknowledgments: We would like to thank Mendel University for supporting this project from IGA grant scheme (IG 290191) and to owners and staff of Dairy Farm GenAgro Říčany a.s. for understanding and great help during research.

EFFECT OF FEEDING OF MOULDED MIXTURES ON GROWTH INTENSITY OF LABORATORY RATS

Horký P.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: pavel.horky@mendelu.cz

ABSTRACT

This thesis deals with the effect of various levels of moulded feedstuffs (with different mycotoxins' content) on production and health status of animals.

The whole work was focused on the evaluation of growth intensity of the outbred tribe of laboratory male rat Wistar Albino. Animals were assigned to the trial at the age of 28 days and they were divided into four groups with seven animals at each.

Four different feed mixtures were used with moulded wheat as a mycotoxins carrier. Groups of animals were fed with a mixture free of moulded wheat (control group). Other groups received diets varying in levels of moulded wheat (33%, 66% and 100%).

We studied the following indicators: intake of complete feed mixtures, live weight gain, animal health status and digestibility of organic nutrients (dry matter, crude protein, fat, ash and energy).

The experiment was conducted in compliance with the law on animal abuse No. 246/1992 at the research facility of the Department of Animal Nutrition and Forage Production at the Mendel University of Agriculture and Forestry Brno. At the end of our experiment we observed that groups with 100% and 66% content of moulded feed had significantly lower ($p < 0.05$) increase of body mass (180.81 and 197.77 g) comparing to the control group (225.94 g) it means 19.98% and 12.5%, respectively. Between groups 100% and 33% a significant difference ($p < 0.01$) was found, the 33% group had a better increase of body mass (214.86 g) it means 4.91% difference comparing to the 100% group.

It was discovered that live weight gains are in negative correlation with the level of moulded wheat in the diet. The best results were found in the control group. Weight gain decreased with increasing level of moulded wheat in the diet. Similar results were obtained with the digestibility of organic nutrients.

Key words: moulds, mycotoxin, growing trial, digestibility, laboratory rats

THE EFFECT OF AGE AND INTENSITY OF GROWTH UPON RETENTION OF CALCIUM IN BODY OF CHICKENS

Houserová J., Zelenka J.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xhouser0@node.mendelu.cz

ABSTRACTS

The effect of age upon retention of calcium was studied in the experiment with 16 broiler type cockerels Ross 308 and 16 laying type cockerels Isa Brown from the 14th to the 70th day of age. Chickens were fed *ad libitum* on complete feed mixture containing 9.81 g of calcium per 1 kg. The weight of chickens, feed conversion and balance of calcium were investigated in three day periods. Utilisation of calcium was determined by the chromic oxide indicator method.

Fast-growing chickens Ross 308 utilised 43.2 ± 1.69 per cent of calcium and slow-growing chickens of laying type 38.1 ± 1.82 per cent; the difference was significant ($P < 0.05$). With the increasing age the utilisation of calcium linearly decreased, in chickens Ross 308 significantly ($P < 0.05$) and in chickens Isa Brown highly significantly ($P < 0.01$). Calcium requirement of chickens per kg of feed mixture declines with the increasing age.

One gram of live gain contained in broilers 9.2 ± 0.76 mg Ca and in laying type chickens 8.9 ± 0.36 mg Ca; the difference was insignificant ($P > 0.05$). With the increasing age the content of calcium in laying type chickens did not change and in chicks of meat type highly significantly ($P < 0.01$) increased.

Key words: calcium, poultry, calcium requirement, calcium metabolism, calcium retention

THE GROWTH INTENSITY OF PHEASANT CHICKENS FATTENED WITH DIFFERENT DIETS

Hudečková P.¹, Zapletal D.¹, Vitula F.², Kroupa L.¹

¹Department of Nutrition, Livestock Breeding and Hygiene, Faculty of Veterinary Hygiene and Ecology, University of Veterinary and Pharmaceutical Sciences Brno, Palackého 1-3, 612 42 Brno, Czech Republic

²Department of Veterinary Ecology and Environment Protection, Faculty of Veterinary Hygiene and Ecology, University of Veterinary and Pharmaceutical Sciences Brno, Palackého 1-3, 612 42 Brno, Czech Republic

E-mail: hudeckovap@vfu.cz

ABSTRACT

The aim of this experiment was to evaluate the effect of different diets on the growth intensity and feed conversion in the fattened pheasant chickens up to 80 days of age. The experimental animals were 600 no sexed chickens of common pheasant (*Phasianus colchicus*). The pheasants were housed on the floor under controlled temperature conditions. For the first 60 days of the experiment was used a *day-light regime* of 23/1 h and then up to the end of experiment (80th day) was used a day/light regime of 12/12 h. The chickens were equally divided into the three experimental groups (group 1, 2 and 3) and the each group (n=200) was fed with a different diet with respect to the level of crude protein, fat and metabolized energy. The diet for: group 1 contained a higher level of crude protein, group 2 contained the lowest level of fat, group 3 contained the highest level of fat. This design was respected in the each of used complete feeding mixtures for pheasants (BŽ) during the whole fattening period. Generally, in the each experimental group was fed four kinds of complete feeding mixtures: BŽ 1 up to day 20, BŽ 2 from 21st to 40th day of age, BŽ 3 from 41st to 60th day of age and BŽ 4 up to day 80. At regular 10-day intervals we observed the following characteristics: body weight, average daily gain (ADG), consumption of feeding mixtures and conversion of feeds. The pheasant chickens fed diet with a higher level of crude protein achieved the significantly higher average body weight in 10th, 20th, 30th, 50th, 70th and 80th day of age compared to both of the other experimental groups fed diets with a lower level of crude protein. Concerning the different level of fat in the diets for group 2 and group 3, no significant differences in the body weight were found during the whole period of experiment. Generally, a higher growth intensity of fattened pheasants in all groups was observed between 21st to 60th days of age, with the culmination in the period between 31-40 days (12.7 g of ADG). In the period from 21st to 80th days of age, the consumption of feeding mixtures was founding as the highest for pheasants fed diet with the highest level of fat, as the average for diet with the highest level of crude protein and as the lowest for the diet with the lowest level of fat. The feed consumption traced a tendency of the consumption of feeding mixtures in particular diets.

Key words: pheasants, growth intensity, fattening, different diets.

Acknowledgments: this study was supported by NAZV QH 91276.

THE EFFECT COMPOSITION OF DIETS ON DIGESTIBILITY OF MINERALS

Jančíková P., Zeman L.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xjancik5@node.mendelu.cz

ABSTRACT

The objective of this experiment was to determine the influence of different diets on the digestibility of nutrients and minerals. Eight horses were used for trial conducted in stable Boudky – Velké Němčice. Basal diet was supplemented with mineral feed additive containing zinc and manganese in organic form.

Digestibility of nutrients and selected minerals was estimated through calculation of amount of indicator in feed and in faeces. Digestibility of dry matter was 88.7% for calcium (S_x 17.3), 77.1% for phosphorous (S_x 16.6), and 60.2% for magnesium (S_x 23.5). It is evident from our data that digestibility reached higher values (except for calcium) in horses fed by grain concentrates. On the contrary mares receiving whole oat and pellets had the lowest values. Group of horses receiving grain concentrates, whole oat and pellets showed mean values of digestibility. Digestibility of zinc and manganese from ration was 88.5% for zinc (S_x 7.0) and 75.5% for manganese (S_x 14.7). We discovered statistical increase of digestibility after addition of mineral feed additive by 11.37% and 37.25% for zinc respective manganese, compared with digestibility of basal ration. It can be concluded that digestibility is influenced by diet composition, individuality and form of minerals.

Key words: horses, diet, digestibility, nutrients, minerals, chelate.

THE NUTRIENTS INTAKE FROM FARM FODDERS USED FOR SUPPLEMENTAL FEEDING OF EUROPEAN BISON

Jędroszczyk R., Wilczkiewicz A.

Department of Animal Nutrition and Feed Quality, Wrocław University of Environmental and Life Sciences, Chelmońskiego 38D Street, 51– 630 Wrocław, Poland

E-mail: ren_ia@yahoo.de

ABSTRACT

The source materials (the animals' state and the quantity of applied farm fodders) come from the forest district Kobiór and enclose the period from 2002 to 2007. These information were the basis for an evaluation of the nutritional value of fodders used in supplemental feeding of European bison in the “Żubrowisko” Reserve. In the sequence of the entire year meadow hay and mixture of crops (maize, wheat, oat, barley, wheaten brans) were the ground of applied farm fodders. In the period from October to April European bison had access to root crops (beets and carrots) which were an additional source of nutrients. Dietary evaluation took into account the following nutrients: dry matter intake [DMI], netto energy lactation [NEL], intestinal digestible protein [PDI], organic matter [OM], crude protein [CP], crude fiber [CS], neutral detergent fiber [NDF], fill units for cattle [CFU]. The largest consumption of fodder components was affirmed in January, and the smallest in July. Late in spring and in summer months the level of nutrients intake (from farm fodders) by European bison was similar to nutritional needs of ruminant suggested in norms INRA and DLG. In remaining months especially in winter the level of nutrients intake, except for fill units for growing cattle, was high. Additionally the coefficients of correlation were enumerated between components of fodders and the temperature of the environment. A close relationship exists between the quantity of nutrients eaten by European bison, and the time of year. Minimum value of the coefficient of correlation (- 0.35) was noted for neutral detergent fiber [NDF], and highest (- 0.87) for cattle fill units [CFU]. Together with growth of the temperature of surroundings the quantity of taken alimentary components gets smaller.

Key words: European bison, supplemental feeding, nutritional value, “Żubrowisko” Reserve

CHANGES IN MILK YIELD AND BASIC PARAMETERS OF SHEEP MILK IN CROSSBREEDS WITH DOMINANT SHARE OF LACAUNE BREED DEPENDING ON THE STAGE LACTATION

Konečná L., Kuchtík J.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: konecna@mendelu.cz

ABSTRACT

The main aim of the study was the evaluation of the effect of the stage of lactation on milk yield and chemical composition (total solids (TS), fat (F), protein (P), caseine (C) and lactose (L)) of organic sheep milk. The study was carried out on organic sheep farm where were reared the crossbreeds (n = 79) of Lacaune, East Friesian and Improved Wallachian breeds. The milk recordings and samplings were carried out five times during the whole lactation. The stage of lactation had a highly significant effect ($P \leq 0.01$) on milk yield and contents of all milk components under study. The average daily milk yield was 0.67 l whilst the average contents of TS, F, P, C and L were 18.04%, 6.61%, 6.05%, 4.45% and 4.67%. The contents of TS gradually grew during lactation, whereas the contents of L gradually decreased. The contents of F, P and C were slightly variable during lactation, however in the end of lactation were found the tendency of growing of contents of F, P and C. The daily milk yield was relatively stable till the 120th day of lactation, however afterwards was found the decline of daily milk yield till the end of lactation.

Key words: sheep milk, stage of lactation, composition of milk

Acknowledgments: The research has been supported by project of Ministry of Agriculture of the Czech Republic – QH 91271

MINERAL COMPOSITION OF THE TISSUES AND THE SKELETON OF TWO SPECIES OF FISH

Kubizna J., Jamroz D.

The Faculty Of Biology And Animal Science, Wrocław University Of Environmental And Life Sciences, J. Chelmońskiego 38C Street, 51-630 Wrocław, Poland

E-mail: joannakubizna@gmail.com

ABSTRACT

Each year the total fish consumption increases (FAO, 2003; European Commission, 2004). Also, the human awareness increases when it comes to the influence of the environment – the nutrition, pollution and interaction with other organisms – on the health and productivity of the fish. The studies of the fish nutrition started more than 70 years ago. Due to the specific – aquatic environment of life - to evaluate the digestion of the feeds in fish, the procedures appropriate for homeothermic animals: sheep, cattle, chicken – were used. Therefore, the evaluation of the proper digestion, metabolism, requirement of energy and growth was connected with a certain constant mistake. Now the procedures are perfected due to the years of the examinations and the clarity of the result was improved (Belal, E. H. I, 2005). The knowledge on the fish nutrition notably increased (Craig S., Helfrich L.A., 2002), and also the meaning of the individual minerals in various stages of life of fish has been analyzed (Rainuzzo et al. 1997; Rønnestad et al., 1999). Still, there is the need of precisising and analyzing acquired information.

Key words: mineral composition, *Oncorhynchus mykiss*, *Barbus barbus*. feeding

ELECTROPHYSICAL PROPERTIES OF THE STALLION EJAKULATE

Mamica O., Máchal L., Severa L., Švábová L.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: mamica@mendelu.cz

ABSTRACT

The aim of our experiment was to find relation between the conductivity of the ejaculate and 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 FACTORS INFLUENCING THE NUMBER OF INSEMINATIONS NECESSARY TO FERTILIZE A MARE

Novohradská V., Jiskrová I.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xnovohra@mendelu.cz

ABSTRACT

The aim of my study was to compare the factors influencing the number of inseminations needed to fertilize a mare. I used the data from Equine reproduction centre in Pardubice-Mnětice (ERC Mnětice), data base from the period of seven seasons February 2002 to August 2008. The data base included 3 967 mares, from which 3 693 were inseminated with the fresh sperm and 274 were inseminated with the frozen sperm. The data obtained was analysed by GLM (general linear model) in the statistic program UNISTAT version 5.1. The differences were established between the insemination by fresh sperm and insemination by frozen sperm, breed, age of stallions, mating seasons and the individual stallions by the method of multiplicity's calibration. The number of inseminations needed to obtain gravidity and the influence of the mating season are statistically significant, the highest were reached in year 2002 (1.8) and the lowest on the other hand in 2006 (1.5). The statistically significant differences were found between the breeds: Holstein warmblood horse and Oldenburg warmblood horse, Hafling, Selle Francois and Westfalen horses. The frozen sperm insemination (1.2 ID/gravidity/mare) proved to be more successful method, than the one using fresh sperm insemination (1.6 ID/gravidity/mare). The age of stallion has a significant influence on the number of inseminations needed for gravidity of the mare (inseminations by fresh sperm). When the age of stallion increases, the number of inseminations necessary to fertilize a mare increases too.

Key words: mare, stallion, gravidity, pregnancy, insemination, fresh sperm, frozen sperm, insemination's dosage

EVALUATION OF PERFORMANCE HORSES IN WESTERN COMPETITIONS IN THE CZECH REPUBLIC

Petlachová T., Jiskrová I.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: terka.petlachova@centrum.cz

ABSTRACT

The goal of the diploma paper is to evaluate the performance of various horse breeds entering western riding classes in the Czech Republic approved by WRC CR. The statistical analysis is based on the data collected between the years 2004 - 2008. The criterion was the placing order of each breed within the monitored classes. The analysis using the GLM proved that the breed, class, the owner and the location of the show highly significantly affect the placing order of the horses. Factors such as the show year and sex were insignificant. Consequent Scheffé's multiple comparison test didn't show any significant differences between the individual factors. However, there appeared to be two significantly different pairs according to the Tukey multiple comparison test. It was the age factor where the most successful were the horses of the age of ten (67.25) whereas the most numerous was the group of the five year olds (15%). The second one was the factor of the owner with the highest performance level (80.62) reached by the horses of Pavel Málek and the most numerous (67) being the horses owned by ing. Klára Šalková. Other groups, that didn't prove any differences in accordance with Scheffé's and Tukey's test respectively, were assessed by comparing the mean score values. The breed with the highest mean score is the hucul (71.11), the most numerous one is the quarter horse (38%). The highest number of horses entered the Open Trail All Ages class, Youth Pole Bending is the class with the highest mean score (78.95). Most of the competitors (67%) entered the venues in Rožnov pod Radhoštěm, most successful ones (mean score 70.24) competed in Kostelany.

Key words: western riding, disciplines, horses, breeds, performance

EVALUATION OF BASIC BODY MEASURES OF THE WELSH PONIES AND COBS

Pířová M., Jiskrová I.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: marketa.pisova@centrum.cz

ABSTRACT

At my diploma thesis I was engaged in evaluation of basic body measures of breed Welsh pony and cob. Our aim was evaluation of effects to basic body measures by sex, age of registrated in studbook, year of registrated in studbook and domicile of origin. I used the linear method GLM. We were evaluated basic body measures of Welsh ponies and cobs by domicile of origin too. We used 373 welsh ponies and cobs, 75 stallions and 298 mares. The dates were provided from Association of breeding horses (ASCHK) and The evidention of horses in Slatiňany (ÚEK). In the database were 4 body measures: stick-measure, tape-measure, girth of bone and girth of chest.

The results of my diploma thesis were shown that present numbers of Welsh ponies in the Czech studbook are not enough for demonstration of some significant effects. We detected significantly results ($P \leq 0,05$) for domicile of origin effect at the total herd of withers The circuit of chest was significantly ($P \leq 0,05$) for the age of registrated in studbook. I haven't found any more significantly results in the others effects.

Key words: The welsh pony, cob, body measures, domicile of origin, studbook

INFLUENCE OF APPLICATION OF HORMONE ON HEAT SYNCHRONIZATION AT CROSSBRED GILTS [POLISH LARGE WHITE X POLISH LANDRACE]

Plazak E., Gajewczyk P.

Department of Pig Breeding, Animal Husbandry, Wrocław University of Environmental and Life Science, C. K. Norwida 25/27, 50-375 Wrocław, Poland

E-mail: edytaplazak@tlen.pl

ABSTRACT

The research was conducted on the Pol-Lean Ltd. Farm in Łosice. The research was carried out on 624 crossbreed gilts (Polish Large White x Polish Landrace) with body weight of 120-140 kg and aged 7-9 months, inserted into the basic herd of sows in Łosice farm in 2008 year. The experiment aimed to determine the effect of the oestrus induction by Serodin and Dinolytic preparations in gilts. The hormone preparations were given to gilts in form of injection to stimulating development and ripening of Graafian follicles. All gilts received on a one-off basic Dinolytic and Serodin. After the pass at 83.49% of them manifestation the oestrus appeared. The rest of gilts at which the oestrus didn't appeared after 14 days the Serodin was being given them again in amount of 2 ml and an appearance of the oestrus was being observed. And all after giving hormones the oestrus appeared at 91.82%. Obtained results proved that the oestrus induction in gilts in a big farm simplifies the technological groups formation in the stage of mating and pregnancy and causes that more sows with the oestrus induced stay in basic herd to the third reproductive cycle.

Key words: oestrus synchronization, gilts, reproduction performance

DYNAMIC OF CHANGES OF DAILY MILK YIELD AND BASIC MILK COMPONENTS IN EAST FRIESIAN EWES DURING LACTATION

Pokorná M., Kuchtík J.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: michaela.pokorna@mendelu.cz

ABSTRACT

Dynamic of changes of daily milk yield (DMY) and basic milk components (total solids (TS), fat (F), protein (P), casein (C) and lactose (L)) in East Friesian ewes (n=34) during lactation was carried out on organic farm in Habří in 2009. Seventeen ewes were on the 2nd lactation and seventeen ewes were on the 3rd lactation. The milk recordings and samplings were carried out five times during the whole lactation (on 70th, 100th, 130th, 160th and 190th day of lactation). During the study the daily feeding ration consisted of permanent pasture (*ad libitum*), meadow hay (*ad libitum*), haylage (*ad libitum*) and concentrate on the base of barley and oat (0.1 kg). The average DMY was 1,05 litre whilst the average contents of TS, F, P, C and L were 17.30%; 5.66%; 5.75%; 3.96% and 5.00%. The stage of lactation had a highly significant effect ($P \leq 0,01$) on DMY and contents of all milk components. DMY was relatively steady between 70th and 130th day of lactation and after gradually increased. The contents of TS a F were relatively very variable during lactation. The contents of P and C gradually increased during lactation however the content of L was relatively very well-balanced.

Key words: Sheep milk, East Friesian sheep, stage of lactation.

Acknowledgments: The research has been supported by project of Ministry of Agriculture of the Czech Republic - QH91271.

THE EFFECT OF TREATMENT OF MAIZE AGAINST EUROPEAN CORN BORER (*OSTRINIA NUBILALIS*) ON THE RUMEN DEGRADABILITY OF STARCH IN THE MAIZE SILAGE

Poštulka R., Doležal P.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: roman.postulka@mendelu.cz

ABSTRACT

The aim of this work was to detect the influence of treatment of the maize plants against European corn borer on the rumen degradability of starch in the maize silage. In this experiment were used 3 hybrids (FAO 230, 260, 270). Each hybrid was treated against European corn borer by a chemical preparation (a), the second group (b) was control. At the silage production was further the matter treated (chemical or microbial additive) or did not treated (control). After the opening of the silages were taken the samples and analyzed through the rumen degradability by the method “in sacco”. The data were evaluated by the program Statistica 8 CZ through the method ANOVA. Between the treated and untreated groups was detected a significant different ($P < 0,05$) in the rumen degradability. The controls silages had the higher rumen degradability (55.06% vs. 47.6%).

Key words: Maize, rumen degradability, starch, corn borer

Acknowledgments: The work was written within the framework of Grant IG290081 “The influence of hybrid, silage prepareate and locality on the rumen degradability of starch of maize silage”, funded by the Internal grant Agency MZLU in Brno (IGA).

THE DYNAMICS OF OCCURRENCE OF SPERMATOZOA WITH PATHOLOGIC CHANGES AND EJACULATE QUALITY INDICATORS IN COCKEREL

Švábová L.¹, Máchal L.¹, Severa L.², Mamica O.¹

¹Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xsvabova@node.mendelu.cz

ABSTRACT

The aim of the study was to estimate and to compare the quality of cockerel ejaculates in different time of semen collection and to find out the influence of cock age on the occurrence of pathologic changes in spermatozoa. Cocks of three breeds were tested - Rhode Island Red, Barred Plymouth Rock and Sussex. Semen was collected four times (in the age of 173, 239, 315 a 391 days) and it was done during production period of cockerel. The semen quality was evaluated by determining of basic spermatologic parameters – sperm motility, sperm concentration, ejaculate volume and by morphologic examination of spermatozoa. Average volume of ejaculate was the highest in the first time of collection in the age of 173 days and it was 0.64 cm³. Ejaculate volume decreased in relation to growing age of cockerel. Average sperm motility ranged from 53,3 % (in the age of 239 days) to 78.4% (in the age of 391 days). Motility increased in relation to growing age of cocks, except the second term of collection, lower motility was evaluated here. Average sperm concentration ranged from 2.07 to 2.52 106 mm⁻³. The second time of semen collection (in the age of 239 days) had statistically highly significant ($P \leq 0.01$) influence on the occurrence of sperm morphological abnormalities in ejaculate and it was 61.5%. Generally, the most morphological changes were on tails. The least sperm morphological changes were in the last time of semen collection (in the age of 391 days) and it was only 36.5%. It can be mentioned the highest occurrence of pathologic spermatozoa was found out in the time of the lowest sperm motility in 239 days of cock age, it was time when the ejaculate was collected irregularly. Therefore, we recommend also off-season ejaculate collection as a convenient precaution.

Key words: cockerel, age, ejaculate, sperm, pathologic sperm, ejaculate volume, sperm concentration, sperm motility.

Acknowledgments: The results were obtained with financial support by the Research plan No. MSM 6215648905.

THE EVALUATION OF PROGRESS OF BODY PARAMETERS IN BELGIAN SHEPHERD GROENENDAEL AND TERVUEREN IN CZECH REPUBLIC IN 1999 – 2006

Vágenknechtová M., Hošek M.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xvagenkn@node.mendelu.cz

ABSTRACT

The aim of this study was to make the result database of breeding and to localize the selection of breeding of Belgian shepherd – tervueren and groenendael in Czech Republic. Our aim was concentrated to basic body measures (stick-measure, body length and index of frame). 81 results of groenendael and 222 results of tervueren were evaluated. The basic linear model (GLM), the effects of sex, the year of birth and varieties were used for evaluation. During the analysis of dog exterior it was found that tervueren females (59.43 cm) were taller in average of about 0.9 cm than females of groenendael (58.53 cm). The height of groenendael females was close to the standard (58 cm).

Groenendael males (63.44cm) were taller in average of 1.4 cm and tervueren males (63.77 cm) were taller in average of 1.8 cm when the standard stick measure is 62 cm. These facts were induced by the breeders preferences of taller males. Effect of the year of birth had an influence on index of frame and body length however sex had not. The difference between both sexes was statistically high significant ($P \leq 0.01$) in body length and withers height but there were not found significant differences between the years. The results show us balance in population and in varieties. The basic body measures were in balance with the breeding selection. The breeding selection is sufficient for body measures in groenendaels and tervuerens. It need not to implement any proceeding measures.

Key words: Belgian shepherd, tervueren, groenendael, exterior, index of frame, body length, withers height

Acknowledgments: The research has been supported by project of MSMT of the Czech Republic - MSM 6215648905.

EFFECT OF CONSERVATION ADDITIVE ON FERMENTATION PROCESS QUALITY OF BREWER GRAINS' SILAGE WITH ADDITION OF ABSORBENT HUMIDITY

Vyskočil I., Doležal P., Dvořáčková J., Poštulka R.

Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: ivo.vyskocil@mendelu.cz

ABSTRACT

The aim of the work was to evaluate the effect of chemical conservation additive on fermentation process quality of brewer grains' silage with addition of humidity absorbent (malt sprouts). In a model experiment the fresh brewer grains were used. A dry matter (DM) content of brewer grains was 221.9 g/kg. The brewer grains' were supplied by malt sprouts to reach DM content of conserved matter on level 320 – 350 g/kg. Three treatments with three repetitions were prepared. The treatment A was a control treatment were supplied by humidity absorbent, but without any additive. The treatment B was supplied by chemical additive with its dose 3.5 l per tone. Chemical conservation additive was based on formic acid, propionic acid, benzoic acid and formamide content. The treatment C was supplied by microbiology additive with its dose 2 g per tone. Microbiology additive contains *Lactobacillus paracasei* (DSM 16245), *Lactobacillus lactis* (NCIMB 30160) and *Pediococcus acidilactici* (DSM 16243). Model silages were evaluated after 112 days of conservation at average laboratory temperature 26–28 °C, from each treatment were the final laboratory samples taken and analyzed. In the experiment were monitored following parameters: Dry matter, pH, acid water extract quality, lactic acid content, propionic acids content, acetic acid content, butyric acid content and ammonia and alcohol content. During conservation of treatments A, B and C were no drain recognized. The malts sprouts addition eliminates waste fluid drain. The butyric acid was not detected and propionic acid was detected only treatment C.

Key words: fermentation quality, brewers' grains, silage

Acknowledgments: The work was funded from Project NAZV no. 4027 "Utilizing wastes from malting and brewing industries as a source of proteins for animal nutrition with respect to environment".

SUITABILITY OF ELAND (*TAUROTRAGUS ORYX*) FOR FULL DOMESTICATION

Zejdová P.¹, Kotrba R.^{2,3}, Chládek G.¹

¹Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Animal Science and Food Processing in Tropics and Subtropics, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague, Kamycka 129, 165 21 Praha 6- Suchbát, Czech Republic

³Institute of Animal Science, Prague-Uhrineves, Přátelství 815, 104 00 Praha Uhřetíněves, Czech Republic

E-mail: xzejdova@node.mendelu.cz

ABSTRACT

Our objective was to approve existence of follow – the – leader dominance hierarchy in the herd of farmed elands as reaction to article of Diamond (2002). He stated that one of obstacles for domestication on species basis was “the lack of follow-the-leader dominance hierarchies”. Moreover the index of activity synchronisation should be over 80 % if the herding instinct is high as we can assume on the basis of Grove’s conclusions (1999).

Data were obtained by scan observations during changes of activities (grazing and resting) and during movement along pasture where we determined the animal who leads during changes in herd of 26 elands. We used SAS 9.1., Generalized Linear Mixed Models (GLMM), Pearson’s correlation and index of synchronisation. The most changes of activities from grazing to resting, from resting to grazing and movements along the pasture were initiated by adult high ranked females ($p < 0.0001$). High rate of synchronization of activities (over 80%) related to grazing and resting were dependent on age ($p < 0.04$) not on the sex of subject. The adult females (81.7%) and yearlings (82.3%) were more synchronized with herd members than calves (75.3%).

On the basis of results and with regard to gained theoretical findings about eland we should believe that Diamond’s assumptions are not correct at least for elands. This species seems to have a good potential for full domestication as suitable animal species.

Key words: eland farming, domestication, dominance hierarchy

Section – Agroecology

END OF LIFE TYRE – A VALUABLE RESOURCE WITH GROWING POTENTIAL

Adamcová D., Kotovicová J.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: dana.adamcova@mendelu.cz

ABSTRACT

The worldwide production of waste tyres (so called "end of life tyres" - ELT) grows every year. The same situation is in the Czech Republic and in the countries of the European Union, but also in the world. „Every year about 3.4 million tonnes of used tyres (part worn + end of life tyres) are generated in Europe, of which 3 million tonnes are either recycled or recovered. This amounts to approximately 300 million units. The composition and energy characteristics of tyres are a significant source of material, energy and also raw material. Calorific value tyres ranges from approximately 32 MJ.kg⁻¹. Calorific value is one of the important properties of waste tires.

The aim of the research is focused on the second part of product life cycle - the tyre at the end of lifetime. The main possibilities of utilization of used up tyres 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 objective of the work is to describe the situation of waste tyres in the Czech Republic in the European Union and the world and focus on the issue of return. The return of waste tyres in the Czech Republic due to legislation (Act on Waste No. 185/2001 Coll., As amended, § 38, and others). The return of waste tyres is very important. Retrospectively collected tyres can be re-used, not become waste in nature.

Key words: tyre, waste, recycling, retreading, legal conditions, resource, ELTs management systems

THE APPLICATION OF PROFILE CHARACTERISTICS OF SOIL PHYSICS PARAMETERS IN ARCHEOLOGICAL RESEARCH ON THE EXAMPLE OF MIKULČICE LOCALITY

Hladký J., Pokorný E.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: hladkyjan@atlas.cz

ABSTRACT

The objective of mentioned work is – above all – to take pedology samples from uncovered archaeological excavation. Subsequently, to submit acquired samples of soil to physical analysis in the laboratory and to evaluate them for purpose of the using of the pedology and other natural sciences in the archaeological research. Common methods, used in agricultural research, were used for laboratory analysis. Physical analysis of intact sample, graining analysis by means of pipette methods and identification of mass density with the help of Gay-Lussac density bottle. By means of these seemingly simple methods, cultural layer from the period of Great Moravia was identified, most probably the remainders of building and possible dunghill.

Key words: Great Moravia, Mikulčice, cultural layer, mass density, bulk density, granularity, Great Moravia dunghill, Great Moravia building, stable isotopes, edaphic probe, non-destructive archeology

Acknowledgments: This study was supported by research plan No. MSM6215648905 „Biological and technological aspects of sustainability of controlled ecosystems and their adaptability to climate change“ of the Ministry of Education, Youth and Sports.

THE STUDY ALTERNATIVE OPTIONS TO THE PROSPECTIVE ACCUMULATION OF SURFACE WATER LOKATIONS SKRYJE

Kniezková T., Hubačíková V.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkniezko@node.mendelu.cz

ABSTRACT

Our objective was to design a replacement variant of surface water accumulation of the prospective Skryje location and compare it with the original proposed variant derived in the 70ies in the document Technical-economic evaluation of water reservoirs in the 70ies, processed by Water Development and Construction, Engineering Company in Prague. The fundamental objective is to propose a new option to place the tank to prevent flooding of villages so people living in Skryje do not have to be evicted. The tank has to fill its purpose simultaneously.

There were used literary and internet resources dealing with the issues, map data, photographs and information provided by Povodí Moravia in the experiment. Own field research was carried out and the relevant photographic documentation. The alternative options of the prospective surface water accumulation of the Skryje locality was created. It included the necessary calculations and drawings processed in the map form by ArcGIS program which enabled the detection of some required parameters. At the end the two options were compared and conclude.

The proposed option is shifted up against the flow of water, above the residential part, and its volume is significantly smaller, nevertheless it would meet the basic purpose, namely emendation of the Svratka flow and flood protection of the Bobrůvka (Loučka) valley and of the river Svratka. 51 objects would disappear below the surface of the original variant. A new variant will flood only 20 of them, which are only temporarily occupied cottages and a recreation center. This prospective locality is ideal for the dam location. There are suitable conditions in terms of morphological (knockouts deep, narrow valley) and demographic (sparsely populated area, the preponderance of chat objects). Due to overlook change climate, that occurs, the possibility of dam reservoirs in this area was not completely rejected.

Key words: village Skryje, Bobrůvka River, major river basin plan, the prospective site for the accumulation of surface water, replacement alternative.

Acknowledgments: . Authors would like to thank Mr. Ing. Martin Borák for providing the necessary information.

THE EFFECT OF FERTILIZATION WITH BIODEGRADABLE WASTE COMPOSTS ON FRACTIONAL COMPOSITION OF SOIL HUMUS

Koncewicz-Baran M., Gondek K.

Department of Agricultural and Environmental Chemistry, Faculty of Agriculture and Economics, University of Agriculture in Cracow, Al. Mickiewicza 21, 31-120 Cracow, Poland

E-mail: koncewicz_m@wp.pl

ABSTRACT

The investigations, conducted on the basis of two-year pot experiment, aimed at an assessment of the effect of fertilization with composts prepared of plant and mixed municipal wastes on fractional composition of humus compounds in soil. The point of reference for the analyzed features was the soil fertilized with farmyard manure and mineral salts. The composition of humus compounds was determined using Kononowa and Bielczikowa's method. Compost admixture led to elevated organic carbon content in comparison with the concentrations assessed in soil fertilized with mineral salts. The smallest quantities of carbon were extracted by means of $\text{Na}_4\text{P}_2\text{O}_7$ and NaOH mixture after the first year of the experiment from the soil fertilized with mixed municipal waste compost. After two years, the content of this humus fraction diminished most in the soil receiving plant waste compost. Value of $C_{\text{KH}}:C_{\text{KF}}$ ratio was generally lower than one and compost fertilization affected this parameter more favourably than farmyard manure treatment. Values of $E_4:E_6$ of released humic acids evidences their simple structure. The content of non-hydrolyzing carbon in individual treatment soils did not differ significantly.

Key words: compost, fertilization, soil, humus compounds

PROPOSAL OF ANTIEROSION SOIL PROTECTION IN TROSKOTOVICE CADASTRAL TERRITORY

Lipovská Z., Toman F.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: zdenka.lipovska@uake.cz

ABSTRACT

This paper analyzes the current status and the use of the Troskotovice cadastral territory in terms of its threat to water and wind erosion. The final objective was to design a system of organizational, technical and agro-technical measures and assess their effectiveness with regard to the permissible soil loss.

The field research was realized to explore more terrain. The Universal Soil Loss Equation by Wischmeier and Smith (1978) was used to calculate the average long-term soil loss. The method developed by the Research Institute for Soil Amelioration and Conservation (Podhrázká et al., 2008) was used to determine the potential wind erosion vulnerability.

The result is a design of measures system and the assessment of their effectiveness with regard to the permissible soil loss and the ecostability increase. The belt rotation was chosen as organizational measure, the conservation tillage (erosion maize and sugar beet cultivation, crops adding) as agrotechnical measure and the contour furrow system and the dirt road with erosion control features (obtaining trees) as technical measure.

There were proposed two variants of the erosion-control measures that can be combined with each other. Both variants reduce the overall soil erosion portorage at about half the value compared to the original state. Some of measures that were designed for protection against water erosion affect reducing wind erosion simultaneously. A set of measures needed for the recovery of windbreaks were also suggested.

The measures should help to increase the overall value of the landscape as they were designed to reduce erosion processes in the most effective way and improve the ecological stability of the territory. The interests of agricultural entities were also considered.

Key words: Erosion, Soil, Antierosion Soil Protection

Acknowledgments: The paper was prepared with the support of the Research Project No MSM6215648905 "Biological and technological aspects of sustainability of controlled ecosystems and their adaptation to climate change" issued by the Ministry of Education, Youth and Sports of the Czech Republic.

APPLICATION LIFE CYCLE ASSESSMENT OF INDUSTRIAL FLOORS IN AGRICULTURAL PRODUCTION

Malý K., Kotovicová J.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: kmaly@centrum.cz

ABSTRACT

The article is concerned with problems in the application of the life cycle analysis (LCA) method in the course of production of floor systems for agricultural and industrial premises. The process was based on international norms, and within the interpretation of results the method of multi-criterion evaluation was used to achieve higher objectivity.

For the purpose of this research, floors on the base of concrete, dry-shake and asphalt have been selected from a wide range of different floors as they are commonly considered the most often used and sold ones. Taking solely the environmental aspect into consideration, the production of classical concrete floors has proved to cause the least environment damage, the dry-shake floors cause slightly higher environment damage and the asphalt floors, as regards this aspect, seem to be the least suitable.

The obtained results along with the proposed method can be useful criteria for decision-making processes within the incorporation of environmental safety of similar construction methods.

Key words: asphalt, concrete, dry-shakes, industrial floors, agricultural premises, LCA.

BUFFERING ABILITY OF SOIL TYPES REGOSOL AND PHAEOZEMS

Martinec J.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xmartin9@node.mendelu.cz

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 regosols (RG) and phaeozems (PH). Other monitored soil properties included pH/H₂O, pH/KCl, Cox, Q4/6.

Samples of individual soil types were collected in eight localities largely with arable soil. The soil samples were taken at depths equivalent to the depth of topsoil.

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 regosols has the lowest. Regosols, on the other hand, has the best ability to buffer bases, while phaeozems has the worst.

Key words: soil, buffering ability, chemical soil properties

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.

EFFECT OF AUTOMOBILE TRAFFIC ON MORTALITY OF SELECTED SPECIES OF MAMMALS

Mrtka J. ¹, Borkovcová M. ¹, Veselý P. ²

¹Department of Zoology, Fisheries, Hydrobiology and Apiculture, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xmrtka@mendelu.cz

ABSTRACT

Presented work monitors an influence of car traffic on mortality of selected species of mammals. The aims of this work were to collect animals killed by automobile conveyance in selected territories and then evaluate detected facts. Monitoring was carried out in the area of Czech-Moravia highlands during the year 2008. Killed subjects were documented on basis of our own observations. Totally 46 mammals found on the roads were documented during the observation period.

Most findings were collected on 2nd class roads, then 1st class roads and 3rd class roads. Among game species hare roebucks were mostly collected, among other animals both common mole and hedgehog. But a lot of species had not been collected at all; therefore further observation would be suitable.

Key words: mammal, mortality, overland communication

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.

RURAL DEVELOPMENT OF SOUTHERN MORAVIA REGION UNDER THE INFLUENCE OF GLOBALIZATION

Náplavová M., Novotná K., Vaishar A.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: miloslava.naplavova@mendelu.cz

ABSTRACT

Globalization is one of the key challenges facing rural regions in Europe. It is bringing significant social, economic, cultural and political changes. Current studies on the impact of globalization on rural regions tend to focus on specific sectors, processes or localities. The objective of rural development is to improve the quality of life of rural communities that meets their socio-economic and cultural endeavors, and enhance their social structure, along with protection of natural resources. The aim of the project DERREG (Developing Europe's Rural Regions in the Era of Globalization) project is to produce an interpretative model that will allow regional development actors to better anticipate and respond to the key challenges of globalization for disadvantaged regions. This will disseminate scientific knowledge and understanding, inform the policy development, and identify examples of best practice. The project is part of the 7th European Framework Program. The project includes seven work packages. MUAF is working on work package one, three and six (WP1, WP3, WP6). It is also involved in the work package five (WP5) in the delivery of work on the South Moravian region for comparative analysis of individual regions.

The objective of this article is to introduce the historical achievements of the project for which cooperates MUAF. In the work package WP1 the data was collected for coordinator who has to process the methodology. The processing of literature research followed. For the work package WP5 a case study of South Moravian Region was developed. The team also works out the basis for a comparative analysis of the South Moravian Region. The analysis of Regional Development Program (2002 - 2006) and recent Regional Development Program was made within the work package WP3. The media analysis was realized simultaneously. The analysis of Regional Development Program was completed on the related passages of the Development Strategy of the South Moravia which differs from the program only by longer planning period and other thematic programs and concepts. It was examined how the different programs deal with specific topics relating to key economic sectors and global environmental discourses and what the trends in these areas are.

Key words: globalization, rural regions, rural development, project DERREG, work package (WP), South Moravian Region

ASSESSMENT OF WATER-SOLUBLE HEAVY METAL FORM CONTENTS IN COMPOSTED BIODEGRADABLE MUNICIPAL WASTES

Ozimek A., Gondek K., Kopec M.

Department of Agricultural and Environmental Chemistry, University of Agriculture in Krakow, Al. Mickiewicza 21, Krakow, Poland

E-mail: aozimek@o2.pl

ABSTRACT

Some kinds of municipal wastes reveal considerable contents of organic matter and nutrients, which after returning to element cycling may be used by plants. It causes that municipal wastes are very good initial material for composting. The use of composts for improving soil properties and soil fertilization may raise controversy, particularly when they are produced of waste substances. Heavy metals concentrations may be one of the factors limiting environmental application of this type of materials. Total contents of these elements in composts allows to assess their potential applications but does not include their bioavailability. Presented research results aimed at determining the effect of municipal waste composting with various additions (starch, edible oil and urea) on the contents of water-soluble forms of cadmium, chromium, lead and nickel in the obtained composts. Total contents of the analyzed heavy metals were assessed after sample mineralization at 450°C for 5 hours and dissolving the remains in diluted HNO₃ (1:2). Water-soluble form of heavy metals was separated using sequential chemical extraction acc. to McLaren and Crawford's method. Heavy metals content was determined in the obtained extracts using ICP-AS method in JY 238Ultrace apparatus (Jobin Yvon). From among the studied metals the smallest amount of total cadmium forms was assessed. The contents of water-soluble forms of the analyzed heavy metals in composts were conditioned by the extraction time and increased after 30 days. Cadmium was an exception in compost with starch and compost with urea, whereas nickel in compost with urea.

Key words: municipal wastes, composts water-soluble forms of heavy metals

EUROPEAN UNION FOREST FIRES, CORRELATED WITH THE CLIMATE CHANGE

Pauliuc E. S., Proorocu M.

Faculty of Agriculture, Engineering and Environmental Protection, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, no. 3-5 Calea Mănăştur, Cluj-Napoca, Romania

E-mail: sinzi_falticeni@yahoo.com

ABSTRACT

Fire is a worldwide phenomenon that appears in the geological record soon after the appearance of terrestrial plants. Fire influences global ecosystem, including vegetation distribution and structure, the carbon cycle, and climate. Although humans and fire have always coexisted, our capacity to manage fire remains imperfect and may become more difficult in the future as climate change alters fire regimes (Bowman *et al.*, 2009). Estimates from the European Forest Fire Information System (EFFIS) show that 200 000 hectares of land in the EU have already burnt till august 2009, compared to a total of 180 000 in 2008. The most affected states were Spain and Italy because of the extreme fire weather conditions in the second half of July. Many studies from all over the world, demonstrated a strong link between the climate change and the increase of forest fires (Flannigand *et al.*, 2000). In the future, under a warmer climate, we expect more severe fire forests, more area burned, more ignitions and a longer fire season.

Key words: climate change, fire, greenhouse gases, damages.

PHOSPHATE ACTIVITY OF MICROORGANISMS IN PLANT COMMUNITIES SOILS AFFECTED BY CLIMATE CHANGE

Pavlíková D., Szostková M., Záhora J.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: ditapavlikova@seznam.cz

ABSTRACT

Acidification of the environment can result in some areas in violation of a critical threshold load for the current vegetation. At the site Kněhyně (1100 meters above sea level) in the Moravian-Silesian Beskydy Mountains (CR), which is strongly affected by air pollution and climatic fluctuations, was observed strikingly high incidence of fern *Athyrium distentifolium*. In our work we elicit related changes of soil microbial activity occurring in locations of *Athyrium distentifolium* compared with the locations of original plant community. The main mechanisms used by organisms to decomposition of organic substances, mineralization and release of nutrients are hydrolytic enzymatic reactions. Therefore, our primary objective is an evaluation of enzymatic activity of soil microorganisms in soils affected by climate change and acidification. First experiments we focused on the determination of phosphatase activity (alkaline and acid) in soil samples taken in spring and summer of 2009. To determine the activity of acid and alkaline phosphatases is applied revised methodology by Tabatabaie and Bremner (1969) using *p*-nitrophenol (pNPP) as substrate.

We compare the representative soil samples from three habitats: from the vicinity of the root system *Athyrium distentifolium*, from among these plants, and from the original plant communities without the presence of ferns. The measurement results show that phosphatase activity is inversely proportional to the distance from their roots both in summer and spring soil. This finding corresponds to findings Szostková and Záhora (2007), which indicates a higher amount of bacteria and bacterial spores in the soil in the immediate vicinity of ferns *A. distentifolium* than in between plants. Comparison of summer and spring soil showed higher values of phosphatase activity in the soil over the summer season. Spring soil shows generally increased alkaline phosphatase activity, summer soil has however a higher activity of acid phosphatase.

Key words: soil microorganisms, phosphatase activity, *Athyrium distentifolium*

Acknowledgments: The contribution was supported by the Research plan No. MSM6215648905 “Biological and technological aspects of the sustainability of controlled ecosystems and their adaptation to changes in climate” of the CR Ministry of Education and by the Research plan IAA600050616, which is financed by the GA Academy of Sciences of the Czech Republic.

BIOLOGICAL AND CHEMICAL PROPERTIES OF EUTRIC CAMBISOL

Petrášová V., Pospíšilová L., Pokorný E.

Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: veronikapet@post.cz

ABSTRACT

Respiration and humus qualitative parameters in Eutric Cambisol (Czech-Moravian Upland, locality Vatín) were determined. We followed total carbon content, fractional composition of humic substances, labile carbon content, absorbance of humic substances in UV- VIS spectral range. Biological parameters included: physiological availability of nitrogen (N/B); amount of available organic substances (G/B); and stability of organic substances (NG/B). Basic soil parameters were also measured. Eutric Cambisol was sandy loam textured, soil reaction was strongly acid and cation exchange capacity was middle. Humus quality given HA/FA ratio was low (less than 1). Respiration correlated with humic substances quality parameters. Correlation between humic substances carbon content and absorbance in UV-VIS spectral range was found. Labile carbon content correlated with humic acids carbon content and humic substances quality.

Key words: cambisol, humic substances quality, biological quality of soil

Acknowledgments: This work was supported by the Research plan No. MSM 6215648905 “Biological and technological aspects of sustainability of controlled ecosystems and their adaptation to climate changes” which is financed by the Ministry of Education, Youth and Sports of the Czech Republic.

FOCUSING OF METALS IN LIGAND FIELD STEP GRADIENT

Šišperová E., Glovinová E., Pospíchal J.

Department of Chemistry and Biochemistry, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: el.siska@seznam.cz

ABSTRACT

The capillary electrophoretic method for the focusing and selective pre-concentration of metal chelates with subsequent on-line ITP analysis was developed and verified.

The ions of alkali earth metals /Mg²⁺, Ca²⁺, Sr²⁺, Ba²⁺/ were pre-concentrated from the mixture and analyzed. Focusing of metals was carried out in ligand field step gradient, which was realized by an addition of a convenient ligand agent to the regular stationary pH step gradient.

During the first step, the metal ions were continuously dosed into the column, where they were selectively trapped on the stationary ligand field step gradient in the form of non moving zones of chelate complexes with effective zero charge. After accumulation of detectable amount of analyte, the dosing was stopped and accumulated zones were mobilized to the analytical column, where they were analyzed e. g. by ITP method with conductivity or photometric detection.

The proper electrolyte system for the dosing /mode IEF/, mobilizing /mode MBE/and analytical step /mode ITP/ were developed and realized.

The selectivity of the trapping can be regulated by a choice of the pH and convenient complexing agents. As a sample analytes served model real mixtures of alkali earth metals. The proposed method enable increase of detection limit is 5-29x in comparison to classical methods - e. g. ITP.

Key words: ITP, metal chelates, focusing

DYNAMICS OF SOME HEAVY METALS CONTENT IN FUR ANIMAL EXCRETA DURING COMPOSTING PROCESS

Tabak M., Filipek-Mazur B.

Department of Agricultural and Environmental Chemistry, Faculty of Agriculture and Economics, University of Agriculture in Krakow, Al. Mickiewicza 21, 31–120 Kraków, Poland

E-mail: Monika.Tabak@ur.krakow.pl

ABSTRACT

Fur animal excreta, due to their high content of biogenic elements as well as the possibility of microbiological and parasitologic contamination, should not be applied directly as a fertilizer. The excreta properties can be improved in composting process. European Union legislation permits fertilization use of composted fur animal excreta.

The aim of the research was to determine the dynamics of some heavy metals content (Fe, Mn and Ni) during the composting process of coypu and chinchilla excreta. Composted were excreta without additions (control) as well as excreta with 20% and 40% addition of leaves and straw. The composting process was conducted in PVC containers in a closed place. The composting lasted 25 weeks. During that time moisture of the materials was kept at a constant level, and every two weeks the materials were mixed for aeration purpose. Samples of the materials were taken after 11, 13, 15, 23 and 25 weeks of the composting process. Heavy metals content was determined by ICP-AES method.

The heavy metals content in the examined composts was decreasing in order: Fe>Mn>Ni. While analyzing the heavy metals content in composts, as a rule the lowest content of elements was determined in composts with straw addition. Moreover, from among the three components used to prepare composts (excreta, leaves, straw), straw had the lowest content of heavy metals. In the whole composting period the compost without additions had the highest manganese content. Dilution of manganese content was observed in the composts with additions (manganese was the only of the analyzed elements whose content was higher in excreta than in both structural materials). Between the first and the last time of analyses (that is 11th and 25th week of composting) an increase in the content of the analyzed heavy metals in composts was observed as a rule. The increase ranged from 1% to 26% of the beginning content of particular elements. The increase in the content of heavy metals in composts can be explained by an organic matter mineralization process occurring during composting.

Key words: fur animal excreta, compost, iron, manganese, nickel

Section – Techniques and Technology

MIXING OF TWO- INGREDIENT GRAIN SYSTEM IN ROTATING AGITATOR

Bilos L., Szwedziak K.

Department of Agricultural and Forest Technology, Faculty of Mechanical Engineering ,
Opole University of Technology, 5 Mikołajczyka Street., 45-271 Opole, Poland

E-mail: lukasz206@wp.pl

ABSTRACT

That thesis has been a first step to establish the correlation between the mixing process parameters, physical parameters of components used in the mixing process and the quality of mixture obtained after mingling. In order to do that the research has been carried out in which ingredients were mixed in two-cone, drum mixer. As for ingredients, coal dust and biomass pellets, the two-ingredient system varying in physical features, have been used. The research was to analyse the arrangement of key component concentration in cross-section mixer. As tracer biomass pellets have been used.

Key words: Non homogeneous materials mixing, biomass pellets, co- combustion

MECHANICAL DEGRADATION OF ALUMINIUM ALLOYS

Dostál P., Černý M.

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: pet.d@seznam.cz

ABSTRACT

The article is focused on mechanical degradation of Aluminium alloys. The main objective of the article is the research of fatigue properties of these alloys loaded on high-cyclic mechanism - elektro-resonance pulsator Rumul Cracktronic. The test pieces of aluminium alloys were subjected by fourpoints bend.

There are solved the problems of fatigue process and mechanism of crack dispersion. Also the origin and the speed of dispersion of fatigue crack is discussed. The particular stages of fatigue process such as cyclic hardening, nucleation of fatigue cracks, dispersion of fatigue cracks and fracture of remaining base section are observed. Also the fatigue limit of concrete material is detected.

Key words: aluminium, aluminium alloys, degradation, mechanical loading, fatigue loading, fatigue crack, cyclic loading, crack nucleation, crack dispersion.

THERMAL EFFECT ON STRUCTURE OF INTERMETALLIC PHASES FE-ZN

Horák K., Černý M.

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xhorak39@node.mendelu.cz

ABSTRACT

The article is focused on studying the effect of temperature on structure of intermetallic phases of the protective zinc layer. The main objective of the article is a description of the structure and the changes that can occur during the heating process. The first part of the article deals with the description of the structure and mechanical properties of the individual stages of transition and their arrangement. The main part of the article focuses on the study of brittle intermetallic phases, which should appear due to increased temperature. For this reason, a set of samples of steel 11 321 was prepared. These samples were subjected to thermal heating in the tempering furnace. Subsequently, metallographic thin sections were prepared, observed and assessed using SEM microscopy and EDS analysis. On the conclusion, the article is trying to explain the influence of intermetallic phases on degradation of the protective layer.

Key words: corrosion, zinc coating, structure, intermetallic phases, temperature, REM, EDS

Acknowledgments: The article was written in the context of the diploma thesis created in connection with the Institute of Design at Brno University of Technology.

THE PROCESSING OF BIOLOGICALLY DECOMPOSABLE WASTES IN „SBM“ TECHNOLOGY ARRANGEMENT

Junga P., Mareček J.

Department of Agriculture, Food and Environmental Engineering, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: petr.junga@mendelu.cz

ABSTRACT

Biologically decomposable materials are significant in general waste production. We can use this kind of renewable material and eliminate negative types of treatment with this material. One of possibility for processing of biologically decomposable wastes there is mechanically biological treatment (MBT). There is experimental project for development of new technological arrangement that make use of mechanical and hydrothermal treatment principles. Experimental development of this technological arrangement for stabilisation of biologically decomposable materials is fit for small and medium agglomeration and as a part of existing technologically links for this material. There are any operational problems which we will have to solve, but these problems are integral part of experimental development of any new arrangement. The results of experimental measurement are proving, that selected way of development is correct and this technological arrangement will be able to successful practically utilization.

Key words: Mechanical-Biological Treatment, Technological Arrangement, Stabilisation, Biological Decomposable waste.

BIOGAS TRANSFORMATION OF LIQUID SUBSTRATES

Karafiát Z., Vítěz T.

Department of Agriculture, Food and Environmental Engineering, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkarafi0@node.mendelu.cz

ABSTRACT

The goal of research is to optimize liquid substrates fermentation process for different sources of materials and raise amount of findings which are necessary for more effective bio-gas stations production using liquid substrates technology. On the basis of time-schedule were chosen materials for testing in anaerobic fermentation (biomass) from agricultural basic industry. In concrete is negotiated on silage, herbal silage, cow and pig manure. These materials are gesticulate and step by step transformed on biogas in different time period, with uncertain dynamism and in different quality and quantity manure gas.

Key words: biogas, biogas station, fermentation, biomass

Acknowledgments: The project is implemented with financial support from the state budget through the Ministry of Industry and Trade of the National Research Program II – Permanent prosperity – Project number 2A-3TP/010

BACTERIA DETENTION BY NANOTEXTILES

Lev J., Černý M., Kalhotka L.

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xlev@mendelu.cz

ABSTRACT

The article describes experiments concerning filtration by nanotextiles of microbiologically contaminated water. The aim of the project is to verify the filtering abilities of the chosen nanotextile materials. A high nanotextile porosity with the pores size of tens of nanometres, is a presumption for the use of nanotextiles for bacteria filtration. The size of bacteria is bigger, which is a good presumption for bacteria to be captured in the nanotextile net. Nanotextile layer from PA612, PUR and Tecoflex on the supporting unwoven textiles was used for the experiment. Bacteria *Escherichia coli* and *Micrococcus luteus* were chosen for the model simulation of microbial contamination. Contaminated water was filtrated during the activity of negative pressure on the output side of the filter from the mentioned material. After three-day incubation on the nutrient media, the cultures found in the water before and after the filtration were compared. In the filtrated water, both bacteria *E. Coli* and *Micrococcus luteus* were indicated, which did not validate the theoretical presumptions of the experiment. Better capturing characteristics of nanotextiles can be assumed for a material with bigger square weight and more effective filtration while using more layers of the nanotextile material.

Key words: filtration, bacteria, nanotextile

Acknowledgments: This study was supported and financed by the internal grant agency Mendel University of Agriculture and Forestry in Brno – Faculty of Agronomy No. 2102/IG290161.

HYGIENISATION OF SEWAGE SLUDGES

Mach P., Mareček J.

Department of Agriculture, Food and Environmental Engineering, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xmach1@mendelu.cz

ABSTRACT

Sewage sludge should be treated before use to minimize the risk of activity to the environment and to human health. The article treats about legislation for sewage sludge use and ways for sewage sludge treatment.

Key words: hygienisation, sewage sludge, indicator microorganisms, legislation.

USING OF PAPER SLUDGE WASTE MATERIAL, MADE OF CORRUGATED CARDBOARD AND SOLID FIBREBOARD

Sklenář M., Kotovicová J.

Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: milan.sklenar@post.cz

ABSTRACT

Our objective is to analyse the paper sludge, which is a clay-like material consisting of clays and short fibers. In the paper recycling process, waste paper is received and de-inked prior to recovery of the fiber. During the de-inking process fiber sludge is generated, which contains particles of ink and fibers too short to be converted to a finished paper product. In the past, paper sludge has typically been land filled. With landfill costs rising and the potential for ground water contamination from landfill operations, many environmentally conscious paper producers are recovering the energy from this waste stream. Thanks to the chemical analyses was FOUND, that in the paper sludge, there are elements useful for next industrial use. Whatever kind they are, it is important to get rid of the present ink, there is a possibility of using sludge in building industries. Interesting is the rate C:N (carbon to nitrogen), which is from 16:1 to 20:1. This makes the possibility to compose DE-inked material. There is stil a problem with the composing of the paper sludge, there are often present heavy metal particles like cadmium or zinc. THE vermi-composing will be our further target.

Key words: paper sludge, landfill, fiber, de-inked, compose, contamination, particles

DYNAMICS OF THE HAY AGGREGATOR FELLA TS1602 HYDRO**Šmíd V., Bartoň S.**

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: vlasmi@centrum.cz

ABSTRACT

The work presents mathematical modelling of working cycle of hay aggregator. Analytical model is based on the programme Maple 11. It leads to the evaluation of the influence of dimensions of constructional parts and working parameters on dynamics and power consumption during one working cycle. It also enables determination of the power consumption of the whole machine. This approach enables creation of precise graphs showing kinematics of the working parts as well as computation and drawing of graphical dependencies showing dynamic stress or energy consumption. The model is a powerful tool for predicting of fuel consumption dependence and operational wear of working parts.

Key words: Maple 11, mathematical modelling, stroke area, working curve, power, force.

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

RECYCLATION OF PLASTIC WASTES FROM PRODUCTION OF PVC ROOFING SHEETS

Špaček I.¹, Kotovicová J.²

¹Department of Environment, Fatra, T. Bati 1541, Napajedla, Czech Republic

²Department of Applied and Landscape Ecology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: ivospacek@seznam.cz

ABSTRACT

Our goal in the experimental part is describing of project of material recycling of heterogeneous (composite) plastics. Especially it is a production waste from isolation roofing sheets made from soft PVC and textile. From the point of LCA this production waste can be identify such as pre-consumer waste. Production waste has advantages for recycling and next using in production. Production waste is defined of quality, purity and known properties. Recycling plastic from production waste can be easily return back to production.

This project describes production line for mechanical recycling. It works on the principle of mechanical shredding (grinding) and separating of PVC roofing sheets. Crushed material contains PVC and textile PES fibers. PVC and textile PES fibers such as “synthetic wool” - “PES wadding” are pneumatically separated from crushed material. Process of mechanical shredding and separating is multistage process. Target this process is granulate of PVC with defined quality as purity and dimension. Product of recycling can be used back to the some product – roofing sheets. Project of recycling is environmental friendly method for recovery PVC composite waste PVC with textile. Project can decrease mass of disposal waste.

Key words: PVC, recycling of composite plastic waste, mechanical shredding, roofing sheets, cleaner production, waste generation

THE DATA STRUCTURE AND ITS ELEMENTS AS GRAPHIC OUTPUT FOR GEOGRAPHIC INFORMATION SYSTEM IN THE ENVIRONMENT AND WASTE MANAGEMENT

Štachová Z., Rybář R.

Department of Agriculture, Food and Environmental Engineering, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: zuzana.stachova@mendelu.cz

ABSTRACT

This project deals with the data structure and its elements in term of the design and graphic expression in the project of the Geographic Information System Design in the Environment and Waste Management for the company Czech Railways. The system's aim is to create complex evidence for Czech Railways Waste Management. The aim of this work is to create data content and the chosen elements visualize in a map as graphic output useful in this system. The procedure design come out from the standard methodology of prototype method of system development. The developed prototype can be used as the new part of the next project. The digital map perform here as a graphic underlayer, where the chosen data elements are visualized in the program MapInfo. The data elements were chosen in the view of the practical demonstration as a point, line and area visual display. The railway stations as the waste producers were chosen as the point elements, the interference of the protected landscape areas and the railway route represent the line elements and the flood lands in the railway route area are displayed as area elements. The proposed system is of course a big contribution; it ensures better overview, transparency and control of the evidence and meeting of the law limits. Information systems ensure better communication between subjects and contribute to the better and more efficient searching. The work is getting effective thanks to the information technologies and the information systems simplify everyday work not only in the waste and environment questions.

Key words: Geographic Information System, Data Structure, Environment

Acknowledgments: I would like to thank the Project team of the Geographic Information System Design for a company České dráhy, a. s. and doc. Ing. Rudolf Rybář, CSc. for their help.

THE EFFECT OF THE LOAD OF A COMBUSTION ENGINE ON ENERGETIC AND PERFORMANCE PARAMETERS OF TRACTOR AGGREGATE

Tatíček M., Bauer F., Sedlák P., Čupera J.

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xtaticek@node.mendelu.cz

ABSTRACT

Through increasing price of propellant, the fuel consumption becomes the main factor which influences economy of the tractor aggregates running. The paper shows influence of load combustion engine and his operational mode to effective feature of tractor aggregates. The measurement was realized with a tractor New Holland T7050, aggregate with 5-furrow reversible plough. Data such as engine load, engine revolution, diesel fuel consumption, diesel fuel temperature, were got from CAN Bus network during the measurement. Then were measured following parameters total time of ploughing, depth of ploughing, time of turning and swath of tractor aggregate. The specific consumption of diesel fuel and the efficiency of the aggregate were calculated using the aforementioned parameters. The measurements were made in different engine operational mode. The speed gears were shifted automatically and manually. The results were then confront

Key words: tractor aggregate, efficiency, specific fuel consumption, loading of engine

Acknowledgements: These measurements were performed on the base of results obtained within the framework of an research and development project EU COST 356 „Agricultural transportation and its environmental effects“. The presented study was supported by the Research plan No. MSM6215648905 "Biological and technological aspects of the sustainability of controlled ecosystems and their adaptability to climate change" financed by the Ministry of Education, Youth and Sports of the Czech Republic.

RESEARCH OF ANAEROBIC FERMENTATION OF ORGANIC MATERIALS IN SMALL VOLUME BIOREACTORS

Trávníček P., Vítěz T., Dundálková P., Karafiát Z.

Department of Agriculture, Food and Environmental Engineering, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: petr.travnicek@mendelu.cz

ABSTRACT

The biotechnology of biogas production is a complicated process because of the service and technology. It demands quality process monitoring with a high-speed response. Because of that there was established a specialized working compartment – The Wholerepublic Reference Laboratory of the Biogas Transformation. The main aim of our laboratory is to provide an expert assistance for the biogas station operators during the optimization of the used substrates and entry materials. The expert analysis can help operators to reach the maximum feasible production. Currently we are focused on the monitoring of the bioenzymatic preparation influence on the biogas station operations.

Key words: biogas, laboratory, bacterial concentrate

Acknowledgements: The project is financed by Skupina ČEZ „Green Energy“: The project number 2007.S044.02 and number 2008.S047.02

DIAGNOSTICS OF A HYDRAULIC PUMP STATUS USING ACOUSTIC EMISSION

Varner D., Černý M., Mareček J.

Department of Engineering and Automobile Transport, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: info@davar.cz

ABSTRACT

Presented article describes status evaluation of a hydraulic pump used in a aircraft construction. Acoustic emission (AE) signals have been monitored both for new and used hydraulic pump. Two significant parameters have been taken into account: RMS and values of PSD fiction for individual AE events. The AE monitoring method has proven significant changes of RMS and minor changes of PSD function between the new and the used hydraulic pump.

Key words: acoustic emission, hydraulic pump, aircraft construction

Section – Food Technology

TEXTURAL PROPERTIES OF SOY MEAT ANALOGS

Hanzelková Š., Simeonová J.

Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: sarka.hanzelkova@mendelu.cz

ABSTRACT

A texture of meat analogues made of soy flour is essential for consumer's perception of its palatability. Inappropriate hardness, springiness or chewiness can cause low interest in this valuable source of proteins. It is important to understand fundamentals of the physical properties of the textured soy protein in order to assure proper preparation of this food. A range of food products made from textured soy protein (TSP) known also as "soy meat" were studied for their textural properties. Samples produced by various producers were obtained in the market. It was a variety of stripes, cubes and slices made from TSP. Textural properties were measured by three objective methods: Warner – Bratzler (WB) shear device, Kramer shear cell and the compression test on a device Tira test 27025. Specimens were prepared from the TPS which was boiled under controlled conditions. The effect of cooking time and the influence of addition of salt during cooking were evaluated. The results were compared to the experiment with beef. A statistical method (ANOVA) was used to determine the significance of the variable and the relationship between the results. In order to give a resume of the results the most significant was the effect of brand name and addition of salt. The differences between different cooking times were noticeable.

Key words: Textured soy protein, meat analogue, hardness, Warner–Bratzler test, compression test, Kramer shear cell test

Acknowledgments: The study was supported by the internal grant No. 234/2102/IG290171 of Mendel University of Agriculture and Forestry in Brno.

EFFECT OF MALTING BARLEY STEEPING TECHNOLOGY ON WATER CONTENT

Homola L., Hřivna L.

Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xhomola@mendelu.cz

ABSTRACT

The aim of the study was to observe differences in steeping between individual mutation of malting barely, year of produce and also used technology.

The experiment was done in the brewer's and malty research institute in Brno and for testing were used samples of malting barley from gathering of the years 2007 and 2008. The assessment was done in local micromalt-house. The barley was steeped for three days by using two different technologies. There were used technologies of eight hours and twelve hours steeping.

Results of this study had shown that samples from the year 2007 had taken more water then the samples from the year 2008. The highest water content in the year 2007 had the varieties Sebastian and Malz, the lowest had Bojos and Tolar. Nearly the same was the year 2008, the highest water content had varieties Sebastian and Prestige and lowest Bojos again.

Key words: barley, malt, steeping, steeping stage

DRESSING PERCENTAGE AND MEAT COMPOSITION OF BROILERS FED DISTILLERS DRIED GRAINS WITH SOLUBLES

Hošková Š.¹, Lichovníková M.², Urbanová P.¹, Skládanka J. ¹, Hošek M.², Zeman L.¹

¹Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: sarka.hoskova@mendelu.cz

ABSTRACT

The aim of our experimental supervision was detected the effect of feeding DDGS (distillers dried grains with solubles) on broiler's dressing percentage and meat composition – dry matter, content of crude protein in dry matter and content of fat in dry matter in breast and thigh meat. There were used 500 one day old male broilers of Ross 308 hybrid combination which were divided into 5 stalls by 100 pieces. Broilers were fed by a starter until 12 day of experiment; it was a standard commercial diet BR1. Experimental feed mixtures BR2 were fed from 13 day to 35 day. Experimental diets were formulated to contain: 1) 0% DDGS (control group), 2) 10% DDGS, 3) 15% DDGS, 4) 20% DDGS, 5) 25% DDGS. Five broilers of each group were weighed, slaughtered and then was calculated their slaughter efficiency. The analysis of dry matter, crude protein and fat have been done in breast and thigh meat. The best dressing percentage had control group without DDGS, it was significantly better ($P < 0.05$) than group with 15% DDGS. The highest content of dry matter in breast and also in thigh meat was in group with 15% DDGS. The content of crude protein in dry matter of breast meat was significantly higher ($P < 0.05$) in groups 10 and 20% DDGS than in group 15% DDGS. The highest content of fat in dry matter of breast meat was in group 25% DDGS. There were no significantly differences between groups in content of crude protein and fat in dry matter of thigh meat.

Key words: distillers dried grains with solubles, broiler, meat composition, dressing percentage

Acknowledgments: This project was supported by IGA of MZLU as project no. IG290101.

DYNAMIC CHANGE OF TECHNOLOGICAL QUALITY OF SUGAR BEET DURING GROWTH

Chodurová M., Hřivna L.

Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xchodur0@node.mendelu.cz

ABSTRACT

The goal of thesis is to outline the production and process of sugar cane, rate the quality of raw material in company Cukrovar Vrbátky a.s. in four production years 2005, 2006, 2007, 2008. The attention is devoted not only to quality of harvested sugar cane, but also to dynamic growth within the vegetation and to changes in technological quality. Our process of sampling begins in the middle of July and proceeds every 14 days until the campaign starts. It is determined the weight of root and shaw, sugar content, soluble ash, α aminonitrogen. In campaign it's determined gain of root, sugar content, soluble ash, α aminonitrogen and pureness common ratio of diffusion juice.

In 2005 the average digestion was 15.59%, in 2006 it was 15.57%, in 2007 it was 15.58% and in 2008 it was 16.71%. In 2005 the average soluble ash was 0.35%, in 2006 it was 0.41%, in 2007 it was 0.42% and in 2008 it was 0.37%. In 2005 the content of α aminonitrogen was 21mg/100g of sugar cane, in 2006 it was 24mg/100g, in 2007 it was 29mg/100g and in 2008 it was 28mg/100g. According to values of MB factors the years 2005 and 2008 were the best years in aspect of fruitiness.

Key words: sugar beet, technological quality, digestion, soluble ashes, α aminonitrogen

THE DETERMINATION OF EXTRACT IN BARLEY BY THE ENZYMATIC WAY

Karásková I., Gregor T.

Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkarask7@node.mendelu.cz

ABSTRACT

The aim of this work was determine extract in barley by the enzymes on base proteases, cellulases, xylanases, β -glukanases and amylases. These enzymes were disintegrated components of grain of barley analogous to natural enzymes in malt; fall off so need grain of barley malted. The grain of barley hasn't needed enzymes for disintegration compounds in the barley. The determination of extract in barley by conventional method by prepared sweet, are not practice. For information of extract in barley is used formula by the Bishop. The formula was won experimentally and was for needs modern malting several times forced. Direct method by the help of prepared congress sweet we are making in the final malt. Preparation of the malt lasts usually 10 days; this suit in laboratory conditions does in micro-malt house. Like optimal, shows application enzymes in this succession: cellulase, xylanase, β -glukanase, α -amylase, β -amylase along with protease. In comparison with assessment by enzymatic way in the barley and way by the prepare congress sweet, are record same, with error perhaps 1%.

Key words: extract, barley, malt, enzymatic way

Acknowledgments: Research Centre for Study of Extract Compounds of Barley and Hop, 1M0570.

THE INFLUENCE OF GRAPE PROCESSING AND WINEMAKING TECHNIQUES ON PHENOLIC COMPOUNDS IN WINE PRODUCED FROM MALVERINA WINEGRAPE VARIETY, SOUTH MORAVIA, CZECH REPUBLIC

Khafizova A., Michlovský M.

Department of Viticulture and Viniculture, Faculty of Horticulture, Mendel University of Agriculture and Forestry in Brno, Valticka 337, 691 44 Lednice, Czech Republic

E-mail: asiaseerosen@gmail.com

ABSTRACT

The study of phenolic compounds in grape and wine shows their positive influence on human health. The polyphenolic content in white wines is usually lower than in red ones. However there are grape processing and winemaking techniques that favor their extraction. Wines from Malverina winegrape variety made by different grape processing and winemaking techniques (kakhethian technology, sur lies technology and reducing – standard technology) were examined for total phenol, total flavanol content as well as antiradical activity and reducing power using spectrophotometry. HPLC analyses were carried out to study the content of individual polyphenolics responsible for antioxidant properties of wine. It was found that kakhethian wine is the best from the standpoint of health. As it has the highest total phenol and total flavanol content as well as antiradical activity and reducing power. The highest content of such strong antioxidants as trans-veratrol and tyrosol is in the standard wine (4.09 mg/l) and sur lies wine (29.16 mg/l) respectively. According to obtained data it is possible to say that grape processing and winemaking techniques really influence polyphenolic content. Especially long-term maceration with skins, seeds and stalk favors better extraction of polyphenols, thus increasing beneficial effect of white wines.

Key words: polyphenols, white wine, antioxidant activity, Malverina winegrape variety, kakhethian winemaking technology, sur lies.

Acknowledgments: The wines were made by Vinselekt Michlovsky a.s. The analyses were carried out in the laboratory of MUAUF, Department of Viticulture and Viniculture, Faculty of Horticulture, Lednice, MUAUF in Brno

MICROBIAL CONTAMINATION OF FRUIT TEAS

Konečná H.¹, Kalhotka L.²

¹Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkonec13@mendelu.cz

ABSTRACT

This work is concerned with fruit teas' issues. Experimental part is orientated on specifying significant groups of microbes in samples of fruit teas, and observation of dependance on microbial count during the storing. Another part of the experiment includes comparing the tea microflora before and after the tea preparation. The samples were bought in the chain of department stores, they are fruit tea from ecological agriculture, fruit tea bags and strewn fruit tea. The results were evaluated tabular, graphically and with the statistical methods. Total microbial counts (TMC) reached 102-103 CFU/g, numbers of molds reached 101-102 CFU/g and numbers of sporulating bacteria were about 101 CFU/g. The strewn fruit tea embodied the minimal number of TMC, fungi and sporulating bacteria. All the samples complied with the legislative requirements during their whole storage life.

Key words: fruit teas, microbes, dried fruit

MICROFLORA OF KETCHUP

Kozelková M.¹, Kalhotka L.²

¹Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkozelk2@node.mendelu.cz

ABSTRACT

The aim of this work was assignment of microflora in ketchup and its growth in a process of storage under different conditions (room temperature, in refrigerator).

In selected ketchups purchased in the commercial network, were determined, during storage (i. e. 0. day, 14. day, 28. day, 42. day, 56. day, 70. day after opening) using plate method these groups of micro-organisms: total number of micro-organisms, lactic fermentation bacteria (LFB), coliform bacteria, sporulating bacteria, yeasts and fungies.

In any of the examined samples there were not detected any coliform bacterium, LFB, anaerobic sporulating bacteria and yeasts. The results of present categories of the micro-organisms were compared with appropriate legislation and marked as unexceptionable for all the time of storage.

Using statistical methods it was proved that for the ketchup samples filled in glass containers (ASk, BSk) occurred during storage to increase the number of all groups of micro-organisms. For ketchup samples filled into plastic containers (AP, BP) occurred to increasing the number of micro-organisms as a function of time only at the sporulated aerobic micro-organisms, while the total number of micro-organisms and mold during storage decreased. With the help of Tukey test it was proved that in most samples stored in the refrigerator there was a lower number of micro-organisms than in the same samples stored at room temperature.

Key words: micro-organisms, tomato purée, ketchup

MICROBIOLOGY ASPECTS SALES OF DEEP – FROZEN MILK PRODUCE

Krupková D.¹, Kalhotka L.²

¹Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xkrupkov@node.mendelu.cz

ABSTRACT

Ice-cream and frozen desserts are special food products distributed and sold in frozen condition. Both Czech ice-cream market and ice-cream flavours begin diversify. Vanilla, chocolate and strawberry flavours ice-cream are still best selling in Czech Republic.

In the experimental evidence part, the quantity differences of microorganisms in ice-cream pie with damaged and undamaged packing is presented. In consequence it monitors the microbiological colonization inside of the ice-cream, exposed to: over storage life after wrappage opening, storage under unsuitable conditions and expiration date.

Total counts of microorganisms, lactic acid bacteria, coliform bacteria, mould and sporing bacteria have been checked in samples of ice-cream. Total counts of microorganisms didn't go over the limit permitted by ČSN 56 96 09 and reached maximal value 10^2 CFU/ml. Coliform bacteria were much included in ice-cream with overdue minimum durability, where they went over the limit permitted by ČSN 56 96 09. Mould and lactic acid bacteria were included only sporadically, sporing bacteria occurred in values lower than 10^2 CFU/ml.

Key words: ice-cream, frozen desserts, microorganisms,

ALPHA-AMYLASE ENZYME ACTIVITY IN MALT MADE FROM SELECTED SPRING BARLEY VARIETIES INTENDED FOR BEER PRODUCTION

Michnová M., Ehrenbergerová J., Cerkal R.

Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: michaelamichnova@seznam.cz

ABSTRACT

Activity of alpha-amylase enzyme (EC 3.2.1.1) is considered to be primarily essential for barley's (*Hordeum vulgare* L.) seed germination and crucial for malting and beer processing because this enzyme converts starch to soluble sugar in the endosperm of seeds enabling the fermentation by brewery yeasts. The aim of this study was to evaluate: (i) the activity of alpha-amylase enzyme in spring barley varieties recommended for Czech Beer production (Bojos, Malz and Tolar) compared with varieties intended for malt export (Kompakt, Jersey and Sebastian) harvested in 2007-2008; (ii) the effect of pre-harvest zinc foliar application (dose of 0.5 kg/ha Zn in growth stage DC 31 and DC 55) on the activity of alpha-amylase; (iii) relations between alpha-amylase activity and selected qualitative parameters (extract yield, apparent final attenuation, friability, relative extract at 45°C, beta-glucan content, etc.). The enzyme activity was assessed by the colorimetric method (EBC 4.13). The grain was micro-malted and processed for malt analyses in the Research Institute of Brewing and Malting, Plc. Malting Institute in Brno. The lowest activity of alpha-amylase enzyme (expressed by dextrinizing units – DU/g) was found in the Tolar variety, the export varieties Kompakt and Jersey belonged to the group with a high enzyme activity. No significant differences in the enzyme activity were found after zinc foliar application. Positive correlation between alpha-amylase activity and relative extract at 45°C was found. Negative correlations between the alpha-amylase activity and other selected parameters were found.

Key words: Czech beer, alpha-amylase, EC 3.2.1.1, barley, malt

Acknowledgements: This study was funded by the project No 1M0570 called Research Centre for Study of Extract Compounds of Barley and Hop.

VACUUM VERSUS MODIFIED ATMOSPHERE IN STORAGE OF SAUSAGES

Musilová M.¹, Jůzl M.¹, Kalhotka L.²

¹Department of Food Technology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xmusil11@node.mendelu.cz

ABSTRACT

The objective of this work was to deal with effects of storage conditions on conservation and quality of sausages, respectively to compare two different ways of storage – vacuum packaging and packaging in the modified atmosphere (MAP).

The company Jantar spol. s r. o. provided 5 samples of vacuum packaged sausages and 5 samples of sausages packaged into the modified atmosphere. There were used two different analyses.

The first one was microbiological analysis of total amount of microorganisms, anaerobic bacteria, yeasts, fungi and coliform bacteria. Each sample was analyzed three times, first day, 3 weeks and 4 weeks after production. The second analysis were done by spectrophotometer Konica Minolta monitoring changes in colour on the surface and on the cut of the vacuum packaged sausages as well as of the MAP sausages. The possible colour differences were observed in time, too.

The microbiological analysis proved that the vacuum packaging is more effective in prevention of microbiological contaminations of sausages than the MAP. The results of the second analysis have pointed out that there are differences in colour, however they are so little, that a human eye can not recognize them.

Key words: sausage, packaging, microbiological analysis, colour analysis

Acknowledgments: This experiment was realized in cooperation with private company Jantar spol. s r. o.

POSBILITES OF LEADS TRANSFER IN INDIVIDUAL ANATOMIC PARTS OF POTATO (*SOLANUM TUBEROSUM*, L.) CULTIVATED IN THE SOIL CONTAMINATED BY RISK ELEMENTS

Peltznerová L., Tomáš J., Szabóová G.

Department of Chemistry, Faculty of Biotechnology and Food Sciences, Slovak University of Agriculture, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic

E-mail: linda.peltznerova@gmail.com

ABSTRACT

The heavy metals cumulation in soils and their entering into plants has negative influence on quality of agricultural production and thus it presents the risk of food chain endangering. The aim of the presented study was to survey the possibilites of transfer and cumulation of lead in individual anatomic parts of potato (*Solanum tuberosum*, L.) – potato tops, potato skins and potato tubers. The experiment was realized by the form of pot vegetation survey, in which the soil from locality Výčapy – Opatovce was used, with addition of basic fertilizer with superphosphate, KCl (60%), ammonium sulphate. The experiment was conducted in 2 variants; one variant was with applied 70 mg Pb. kg⁻¹ soil and in 2nd was added 140 mg Pb. kg⁻¹ soil, in form of Pb(NO₃)₂. In this experiment 4 varieties of potatoes were evaluated: very-early Impala, early Livera, middle-early Agria and late Desiree. Heavy metals in these samples were analyzed by AAS method. In soil samples the analyses on the heavy metals content in the leach of aqua regia (total content) and mobile forms in the leach NH₄NO₃ were realized. The exceeded limit value was determined for total content of lead by 53%, for mobile form content of lead by 95%. In potato tops, skin and tubers the highest lead content was observed in variety Impala. In samples of potato tubers the content of Pb from 0.1362 mg.kg⁻¹ Pb in variety Desiree to 0.5021 mg.kg⁻¹ Pb in variety Impala was determined. Obtained results of lead content were compared with their maximum admissible amounts by Slovak standards (0.1 mg.kg⁻¹). On the basis obtained results were claimed that the concentration of lead had overlimit the highest admissible amounts.

Key words: potato, top, skin, tuber, lead, contamination

Acknowledgments: This work has been supported by VEGA project 1/4428/07

EFFECT OF POST-HARVEST MATURATION ON GERMINATION QUALITY OF MALTING BARLEY VARIETIES

Polák O., Psota V., Sachambula L.

Department of Animal Breeding, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xpolak@mendelu.cz

ABSTRACT

The aim of the study was to follow the course of post-harvest maturation in nine malting barley varieties that have been currently most widespread in the Czech Republic. Four parameters characterizing germination (energy, rate, index, and homogeneity of germination) were monitored 3, 6, 9 and 12 weeks after achieving full ripeness. Considerable intervarietal differences in the length and intensity of post harvest maturation were determined. The variety Calgary was the variety with the longest post harvest maturation. All the studied parameters of germination, with the exception of germination energy, were affected by year from 14%, location even from 50% and variety maximally from 16%. Germination energy was significantly affected by the location even from 85%. The effect of year on the level of post harvest maturation declined with time and, conversely, the effect of variety and location increased.

Key words: barley, variety, post-harvest maturation, dormancy, germination

Acknowledgments: Results published in this paper were part of Research Program RIBM „Research of malting and brewing inputs“ supported by MŠMT ČR (MSM6019389369701).

ESTIMATION OF THE ANTIOXIDATIVE PROPERTIES OF THE NATURAL POLYPHENOLS IN THE OXIDATION PROCESS OF MODEL LIPOSOME MEMBRANES

Sierżant K.¹, Gabrielska J.²

¹Department of Animal Nutrition and Feed Quality, Wrocław University of Environmental and Life Sciences, Chelmońskiego str. 38D, 51-630 Wrocław, Poland

²Department of Physics and Biophysics, Wrocław University of Environmental and Life Sciences, Norwida str. 25/27, 50-375 Wrocław, Poland

E-mail: kamil.sierzant@gmail.com

ABSTRACT

The experiment was conducted to proof the new natural plant extracts (*Fagopyrum* Mill. (buckwheat), *Crataegus* ex L., (hawthorn), *Hypericum* L. (St -John's -wort's) and *Helichrysum arenarium*) and selected flavonoids as reference substances for the *in vitro*. The probing was performed as considering four different parameters: the antioxidant activity, the antiradical activity – DPPH test, the DPH test and the CF test. The results of antioxidative test of studied extracts show high antioxidant activity against UVC induced peroxidation of phosphatidylcholine (PC) liposomes membranes (except *Helichrysum*). The main consistent parameter for antioxidant activity was IC_{50}^{PC} (Inhibition Concentration 50 PC – the concentration of antioxidant which reduces peroxidation intensity of phosphatidylcholine liposomes about 50%). Values of IC_{50}^{PC} were following: buckwheat – hulls (20.8 mg/L) \geq hawthorn – cortex (21.6 mg/L) $>$ *Hypericum* L. (25.4 mg/L) $>$ hawthorn – leaves (26.8 mg/L) $>$ buckwheat – stems (29.1 mg/L) \gg *Helichrysum* (121.6 mg/L). The DPPH free radical test results (IC_{50}^{DPPH} – the concentration of antioxidant which reduces the free radical DPPH about 50%) show the high antiradical activity of majority extracts ($IC_{50}^{DPPH} = 2.7 - 7.4$ mg/L), except *Helichrysum* ($IC_{50}^{DPPH} = 34.0$ mg/L). The similar relationship between antiradical activity (IC_{50}^{DPPH}) and antioxidant activity (IC_{50}^{PC}) for the *Hypericum* L., buckwheat – stems and hawthorn – leaves, suggest possible mechanisms of the extracts activity, as the free radical scavengers (scavenger = substance that can deactivates Reactive Oxygen Species or Reactive Nitrous Species). The examination the possibility association of studied extracts to liposomes membrane was one of other aims. His realization was used with the DPH method to assignment the coefficient of constant association ($1/K_D$). The values of $1/K_D$ of the test extracts (ranged 709 – 1000 L/mg) with PC liposomes membrane, may suggest their role as substances to protect the membrane from reactive oxygen species. The influence of studied extracts on structure of PC liposome membranes was also verified using CF test. The intensity of leakage from liposomes under presence of investigated flavonoids was examined using the carboxyfluorescein (CF) marker. It shown that compounds in general (except buckwheat stems) do not trigger malicious actions on the PC membrane liposomes. Percentage of carboxyfluorescein leakage at various concentration of extract for witch got the IC_{50}^{PC} , didn't cross the 2 % (except buckwheat stems = 10.90 %). The obtained results demonstrate possibility of using them (except *Helichrysum*) as antioxidants in food and pharmaceutical or cosmetics industry.

Key words: - natural extracts, antioxidants, peroxidation, liposomes, free radicals, flavonoids

EFFECT OF PLANT EXTRACTS ON MICROBIOLOGICAL PURITY OF FENNEL (*FOENICULUM VULGARE* VAR. *VULGARE* MILL.) DURING STORAGE

Staňková B.¹, Růžičková G.¹, Kalhotka L.²

¹Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Agrochemistry, Soil Science, Microbiology and Plant Nutrition, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: Stankova.b@seznam.cz

ABSTRACT

The aim of this study was to assess the effects of plant extracts, which exhibit antimicrobial activity, on microbiological purity of fennel fruit (*Foeniculum vulgare* var. *vulgare* Mill.) during storage in order to use this method in food industry. The samples of whole fennel fruits (250 g) were treated with aqueous extracts of caraway (*Carum carvi* L.) and of perilla (*Perilla frutescens* L.) and spirituous extracts: marigold (*Tagetes patula* L.), oregano (*Origanum vulgare* L.), caraway (*Carum carvi* L.), hemp (*Cannabis sativa* L.) and celandine (*Chelidonium majus* L.).

After the treating with the extracts, the fruits were stored for 1, 2, 3, 4, and 8 weeks. Using the rinsing method and then the plate method, the quantity of molds and yeasts and the total number of microorganisms in CFU (Colony Forming Units.g⁻¹) were evaluated. It was found that the extracts from the plants have inhibited the growth and proliferation of molds and yeasts in particular. The most active extracts were: spirituous extract of marigold, spirituous extract of caraway, spirituous extract of hemp and spirituous extract of celandine.

Total number of microorganisms was significantly limited by spirituous extract of marigold, spirituous extract of caraway and spirituous extract of hemp.

Key words: *Foeniculum vulgare* var. *vulgare* Mill., plant extract, antimicrobial activity, pathogenic microorganisms, food industry.

THE RISK ELEMENTS CONTENT IN SOIL, SWEET CORN (*ZEA MAYS L. CONVAR. SACCHARATA*) AND SPINACH BEET (*SPINACIA OLERACEA*) CROPPED IN INTENSIVELY AGRICULTURAL USED AREA OF MIDDLE SLOVAKIA**Szabóová G., Tomáš J., Peltznerová L., Árvay J**

Department of Chemistry, Faculty of Biotechnology and Food sciences, Slovak University of Agriculture, Tr. A. Hlinku 2, 949 76 Nitra, Slovak Republic

E-mail: gabriela.szaboova@post.sk

ABSTRACT

The aim of this work was the observing of the content of selected heavy metals in the area of middle Slovakia and also the quality of grown products. The monitoring of heavy metals content in vegetables is very important because vegetable consumption is high.

In our work the site Sikeres situated near Veľký Krtíš was observed. Soil samples were collected by means of surface tranship with 5 second screen using GPS from 13 sampling sites. Sweet corn and Spinach samples were collected by the same points in year 2009.

Soil samples were analysed to determine changeable soil reaction, heavy metals total content in aqua regia extrakt, as well as their mobile forms in NH_4NO_3 lixivium whit $c = 1 \text{ mol.dm}^{-3}$. Atomic absorption spectrometry on apparatus *VARIAN AA 240 FS* was final analysed. Sweet corn and Spinach samples were mineralised by means of microwave decomposition (*MAARS X-press*) and consequently measured in *VARIAN AA 240 Z* graphite oven.

The results were processed into content maps with computer program ArcView 3.2. The results reffer that on this parcel was enhanced mobile form of lead content in samples from all sampling sites in range from $0.18 - 0.25 \text{ mg.kg}^{-1}$. Also the Sweet corn and Spinach yield was analyzed and we can state that the highest acceptable amount for lead in corn was exceeded and the values ranged from 1.506 to 2.231 mg.kg^{-1} .

Key words: siol contamination, heavy metals, sweet corn, spinach**Acknowledgments:** This work has been supported by *VEGA 08-023-00*

PCR IN DETECTION OF FUNGAL CONTAMINATIONS IN POWDERED PEPPER

Trojan V., Hanáček P., Havel L.

Department of Plant Biology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xtrojan@node.mendelu.cz

ABSTRACT

The PCR method for fungal contaminations in powdered pepper was optimized in our previous work. At present work we use this method for detection fungal contaminations in fifteen particular samples of commercially distributed red dried powdered pepper. In all samples under the investigation a fungal contamination was found but none of that belonged to toxinogenic fungi. The results corresponded with classical cultivation fungal detection.

Key words: contaminant detection in spice, pepper, PCR

Acknowledgments: This experiment was realized in cooperation with private company Trumf International s. r. o.

Section – Plant Biology

THE INFLUENCE OF STRIGOLACTONE ON AUXIN TRANSPORT**Buchtová D.¹, Chmelová D.¹, Kalousek P.¹, Balla J.¹, Pernisová M.², Reinöhl V.¹, Procházka S.¹**¹Department of Plant Biology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic²Department of Experimental Biology, Faculty of Science, Masaryk University, Kamenice 2, 625 00 Brno, Czech RepublicE-mail: d.buchtov@seznam.cz

ABSTRACT

Our objective was to assess the influence of the newly described plant hormone strigolactone on the polar auxin transport, that could play a role in a feedback regulation of the homeostasis of auxin and strigolactone. As a model system the roots of *Arabidopsis* WT (Columbia), max1 – max4 mutants and PIN1:PIN1:GFP plants were used. The plants were grown on vertical agar plates on control (MS medium) and GR24 (synthetic strigolactone analog) supplemented medium. The root architecture (length of primary root and number of lateral roots), PIN1-3 gene expression and PIN1 protein localization were determined.

The addition of GR24 caused an increase in the length of the WT primary root and decreased the number of lateral roots (LR). This could be explained by a lower auxin level in the root elongation zone and by a delay in formation of auxin maxima needed for lateral root initiation, both effects signaling that GR24 impairs polar auxin transport. The roots of max1 – max4 are known to have higher auxin transport capacity form more lateral roots than WT plants and GR24 decreased the number of LR to WT level. The observed longer primary root of these mutants and further elongation by GR24 addition could not be satisfactorily explained yet.

Real time PCR quantification of PIN1 – 3 gene expression revealed the most pronounced decrease after 2 days of GR24 treatment. There was also observed by confocal microscopy of PIN1:PIN1:GFP roots a dramatic decrease of expression on the protein level. Altogether the results show a modulation of polar auxin transport capacity by strigolactone on transcriptional or translational level and possibly also by influencing protein stability.

Key words: strigolactone, auxin transport, root architecture, *Arabidopsis***Acknowledgments:** This work was supported by a grant of IGA MUAUF Nr. 5/2009.

STUDY OF GENOME SIZE EVOLUTION

Čegan R.^{1,2}, Obšívačová V.^{1,2}, Kubeková H.², Kejnovský E.², Šafář J.³, Vyskot B.², Hobza R.^{1,2}

¹Department of Plant Biology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

²Department of Plant Developmental Genetics, Institute of Biophysics, Academy of Sciences of the Czech Republic, Kralovopolska 135, 612 65 Brno, Czech Republic

³Department of Molecular Cytology and Cytometry, Institute of Biophysics, Academy of Sciences of the Czech Republic, Kralovopolska 135, 612 65 Brno, Czech Republic

E-mail: cegan@ibp.cz, hobza@ibp.cz

ABSTRACT

The aim of this study is detection of abundance of repetitive elements and their proportion in size of the *Silene vulgaris* genome. Furthermore we intend to compare representation and localization of individual repetitive elements in *S. vulgaris* and *S. latifolia*. Observed data should help to answer why is variability between *S. latifolia* and *S. vulgaris* genome so vigorous. Both species are diploid and have the same chromosome number ($2n=24$), nevertheless *S. latifolia* has 2.5x larger genome than *S. vulgaris*. Preliminary data showed that some repetitive sequences (retrotransposons and tandem repeats) are unique for first or second species, respectively. On the basis of acquired data we decipher how quick is evolution of particular sequences regarding their structure and relative and absolute proportion in the genome. Our data can help shed a light on the question, which concrete DNA sequences causes quick genome expansion of many species from genus *Silene*. Particular representation of repetitive sequences in individual sexes of dioecious species can further help us to understand their role in reproductive strategies evolution and in sex chromosomes formation.

Key words: *S. vulgaris*, transposable elements, genome size evolution, speciation, sex chromosomes

Acknowledgments: This research is supported by IGA MUAF (DP 7/2009)

PROTEOMIC ANALYSIS: UNCOVERING THE SIGNALING PATHWAYS IN PLANTS

Černý M., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: martincerny83@gmail.com

ABSTRACT

Genomic assays have been widely used to elucidate responses to stimulus, but many biological processes are still unclear. In these cases, a new approach should be used, which would reflect responses preceding the transcriptomic ones or independent of mRNA expression, for example response transduced through posttranslational modification of proteins. Phosphorylation is one of the most important posttranslational modifications of proteins. At least 5% of *Arabidopsis thaliana* genome is responsible for regulation of protein phosphorylation, which indicates that nearly all aspects of cell function involve reversible phosphorylation. It is also a major issue in modern proteomics. We present the use of proteomics in study of plant signaling and possible way to uncover external stimulus perception in plants.

Key words: fosfoproteome, proteomic analysis

Acknowledgments: This work is supported by LC06034 and IM06030.

PHOSPHOPROTEOME DYNAMICS IN RESPONSE TO CYTOKININ TREATMENT IN *ARABIDOPSIS*

Divíšková E., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: eva.diviskova@mendelu.cz

ABSTRACT

Cytokinins have been implicated in many developmental processes and environmental responses of plants, including the regulation of cell division, chloroplast development, apical dominance, anthocyanin production, leaf senescence and others. To ensure appropriate responses to stimuli, organisms have evolved signaling networks, and signal transduction often relies on posttranslational modifications of their protein components. One of the most abundant posttranslational modifications is phosphorylation of proteins and peptides. Phosphorylation is a crucial importance in regulatory mechanisms and signaling pathways.

Key words: cytokinin, phosphorylation, posttranslational modification

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

MAIZE BETA-GLUCOSIDASE ZM-P60.1 AND ITS MUTANT FORMS: NOVEL SUBSTRATE SPECIFICITIES

Filipi T., Mazura P., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: filipi@biomed.cas.cz

ABSTRACT

β -Glucosidase Zm-p60.1 was isolated from chloroplasts of maize coleoptyles. This β -hydrolase is able to cleavage artificial (p-NP-O- β -D-Glup, 4-MUG-O- β -D-Glup and XGLU) and natural substrates (trans-zeatin-O- β -D-glucopyranoside and kinetin-N3- β -D-glucopyranoside). Hydrolytic activities also influence levels of free cytokinins (active) and cytokinin conjugates (non-active) in plants. O-Glucosylation of cytokinins represents reversible way of its inactivation, whereas N-glucosylation (N7- and N9-derivates) irreversible pathway. Moreover, plant β -glucosidases activities which might hydrolyse N7- and N9-glucosides were not isolated till now. Our research brings novel information at the field of substrate specificities of maize β -glucosidase Zm-p60.1. It was found, that Zm-p60.1 is able to hydrolyse cis-zeatin-O- β -D-glucopyranoside, and partly (trans-zeatin-N9- β -D-glucopyranoside, while mutant forms W373K, W373K2 and W373K4 hydrolyse only cis-zeatin-O- β -D-glucopyranoside and trans-zeatin-O- β -D-glucopyranoside. Hydrolysis of trans-zeatin-N7- β -D-glucopyranoside was not observed at all. Amino acid residue W373 also influences substrate specificity of Zm-p60.1. Enzyme hydrolytic activities were confirmed by TLC analysis. Subsequently, it was found, that trans-zeatin-N7- β -D-glucopyranoside and trans-zeatin-N9- β -D-glucopyranoside have no inhibition impact on enzyme activity.

Key words: β -glucosidase, maize, substrate specificity, cytokinin, mutant form, glucosylation, TLC

Acknowledgments: Research is supported by REMOROST LC06034 (Ministry of Education of the Czech Republic)

MODULATION OF CYTOKININ ACTION BY DECREASED INTENSITY OF WHITE LIGHT IN *ARABIDOPSIS* – A PROTEOMIC ANALYSIS

Jajtnerová M., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: martimareckova@seznam.cz

ABSTRACT

Light and cytokinin (CK) signaling are intertwined at several levels, and the underlying molecular mechanisms are being actively researched. To get an insight into the modulation of CK action by decreased light intensity at the proteomic level, we used 2-DE followed by image analysis and MALDI-TOF-TOF MS to analyze changes in steady-state protein levels in *Arabidopsis thaliana* seedlings with increased content of endogenous CKs cultivated at standard ($90 \mu\text{mol m}^{-2} \text{s}^{-1}$) and decreased ($20 \mu\text{mol m}^{-2} \text{s}^{-1}$) white light intensities. After the activation of the CK-biosynthetic gene *ipt*, we observed about 61 differentially expressed protein spots (representing about 12% of detected spots). Out of the 61 protein spots, 36 were regulated in a comparable fashion at both light intensities, and 2 and 23 were differentially regulated at only standard or decreased light intensity, respectively. Till now more than 58 proteins have been identified, and can be classified as proteins involved in seed germination, photosynthesis, carbon and nitrogen metabolism and metabolism of xenobiotics.

Key words: Cytokinins, 2D electrophoresis, *Arabidopsis*

Acknowledgments: Supported by grants IAA600040701, LC06034 and 1M06030.

EVALUATION OF THE ACTIVITY OF BARLEY COR/LEA GENES AFTER THE APPLICATION OF THE EXOGENOUS ABSCISIC ACID

Melišová L., Ehrenbergerová J., Holková L.

Department of Crop Science, Breeding and Plant Medicine, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: melisova@email.cz

ABSTRACT

The topic of this study was to evaluate the level of *Hsd4*, *Dhn4* and *Hva1* genes expression together with the leaf temperature measurement after the application of exogenous abscisic acid (ABA). It is well-known that the level of endogenous ABA increases rapidly in response to drought stress and consequently the stomatal closure is induced. ABA has two functions in plants. The first is the regulation of the transpiration and the second is a function of a signal molecule that induces expression of protective genes from the Cor/Lea group. The measurement of temperature is considered as a suitable method for the indirect assessment of the transpiration. The level of stress genes expression has been recently used for determination of abiotic stress sensitivity. In our experiment, we compare ABA induced reaction of five spring barley varieties with different level of drought tolerance. Plants were grown in hydroponic solution (MS Salt, 7h light, 20°C, night 18°C). The ABA solution ($2 \cdot 10^{-5} \text{ mol.l}^{-1}$) was added after 14 days of growth. The samples were collected 1, 3, 6, 12 and 24 hours and 3 and 7 days after ABA application. The measurement of leaf temperature was done with IR ThermoCam (FLIR P 660) (Jones, 1999) 3 hours and 7 days after ABA application. To determine the genes expression we used RT PCR (Pfaffl, 2001). All varieties reduced stomatal conductivity (stomatal closure) after ABA application. The leaf temperature increased after 3 hours and was higher even 7 days after ABA application, however the difference of temperature among varieties was small. Activity of *Hva1* was unspecific and was detected also in control plants, probably due to some unspecific stress (light condition) during cultivation. At this level no differences were found among tested genotypes. The highest activity of *Dhn4* and *Hsd4* was detected in variety *Malz*. It seems, that plant hormone ABA has an important role in induction of stress-reaction in this variety. In case of the Syrian drought tolerant variety *Tadmor* the activity of both genes was only on the border of detection. Although the expression of protective genes from the Cor/Lea group is known to be more rapid in stress tolerance genotypes, the variety *Tadmor* behaved differently. Our theory is, that this variety may have an alternative ABA-independent pathway more active than other tested varieties.

Key words: abscisic acid (ABA), gene expression, barley, drought, abiotic stress

Acknowledgments: IG290071, NAZV QH91192

IDENTIFICATION OF CANDIDATE HEAVY-METAL RESISTANCE GENES IN GENUS *SILENE*

Nevrtalová E., Hobza R.

Department of Plant Developmental Genetics, Institute of Biophysics, Academy of Sciences of the Czech Republic, Kralovopolska 135, 612 65 Brno, Czech Republic

E-mail: nevrtalova@ibp.cz

ABSTRACT

Plants can survive on heavy metal contaminated areas. The phenomenon of heavy metal accumulation and resistance is described in many species of plants. First time was this peculiar trait observed in *S. dioica*, already in 1934. *S. dioica* is a typical plant growing on soils with copper enrichment. There are several known mechanisms that enable plant populations to survive in soils with high concentration of heavy metals. Metallothioneins (MTs) are small proteins with high cysteine residues content and play a key role in defensive reactions of many plant species. Recently, the role of metallothioneins has been investigated especially in the heavy metals detoxicant pathway. It was also shown that MTs are closely connected with the copper metabolism. *S. dioica* and *S. vulgaris* are growing in high copper concentrated sites. We suggested to isolate genes encoding metallothioneins and to determine their role in metabolism of copper. We used cDNA databases of several *Silene* species for the identification of these genes. By screening of the BAC library of *S. vulgaris* with the probe derived from MT3 gene we found positive clones that were subsequently sequenced. This way we characterized the first MT3 gene in genus *Silene*. Expression analysis indicates the importance of the MT3 gene in resistant species, since the expression of this gene is increasing in higher copper concentration in hydroponic cultures.

Key words: metallothioneins, heavy metal resistance and accumulation, copper, *Silene vulgaris*

Acknowledgements: The work was supported by IGA AF MUAF Brno no. DP3/2009 and AS CR grant M200040905.

OXIDATIVE STRESS IN *NICOTIANA TABACUM* EXPRESSING BACTERIAL IPT

Novák J., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: jan.novak@mendelu.cz

ABSTRACT

Cytokinins (CKs) can, among the others, positively regulate shoot development and delay onset of the senescence. However, recently opposite effects of CK action, namely promotion of programmed cell death, and cytotoxic effects of overexpression of the CK-biosynthetic gene in tobacco, were recognized. Here we investigated the cytotoxic effects of *ipt* expression in tobacco in detail. We show that lesion formation in expanded tobacco leaves proceeds shortly after the induction – the first lesions being observed in app. 60 hours after induction of expression, and lesions can spread over the entire leaf area within 5 days after the induction. The formation of visible lesions was preceded by increasing in reactive oxygen species (ROS) as indicated by DAB and 2',7'-dichlorofluorescein diacetate staining despite increasing in a key ROS scavenging enzyme – APX. Further, we demonstrate that lesion formation is a light-dependent process as it is prevented by shading. The expression of *ipt* was also followed by stomata closure as revealed by microscope.

Key words: cytokinins, *Nicotiana tabacum*, oxidative stress, ROS, stomata

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

CHANGES IN GENE EXPRESSION IN TOBACCO WITH INCREASED CYTOKININ LEVEL

Pavlů J., Novák J., Brzobohatý B.

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: czahi@seznam.cz

ABSTRACT

Cytokinins are plant hormones that regulate a number of growth, developmental and physiological processes in plants. Further, we suppose that cytokinins are implicated in oxidative stress. We employed *ipt* activable system to increase endogenous cytokinin level in tobacco. The activation and subsequent elevation of cytokinin level lead to occurrence of necrotic lesions and the other marks of oxidative stress. Two independent lines with different degree of severity in the phenotype were compared. Using real-time RT-PCR we investigated *ipt* transcript level, transcript level of some genes implicated in photosynthesis (*CAB*, *FNR*), photosynthetic apparatus protection (*VDE*) and pathogene response (*PR-1b*, *CHITINASE*). Further, we examined some prospective transcriptional markers for the cytokinins. Real-time RT-PCR analysis showed strong down-regulation of *CAB*, *FNR* and *VDE* and up-regulation of the genes included in pathogen response in activated plants. Comparing the both lines, the degree of up/down-regulation of monitored genes was in accordance with the degree of the phenotype severity. No potential transcriptional marker of cytokinins showed useful properties. Taken together, the damage emerging after the activation of cytokinin biosynthesis gene *ipt* in tobacco is accompanied by dramatic changes in gene expression. The impact of these changes will be discussed in context of previously published data.

Key words: cytokinins, tobacco, gene expression, photosynthesis, pathogen-related genes

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

RESPONSE OF SUSPENSION CULTURE BY-2 ON PRESENCE OF ORGANIC POLLUTANT

Solnická P., Klemš M., Havel L.

Department of Plant Biology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xsolnic0@mendelu.cz

ABSTRACT

We studied effect of organic pollutant (fluoranthene (FLT) 0, 0.5, 5 and 15 μM) on the physiological processes, viability and growth of BY-2 tobacco cells suspension culture. With increasing concentration of FLT in medium, viability and the number of cells decreased (up to three times on the medium with 15 μM of FLT). Production of ethane and CO_2 increased especially in exponential growth phase on the highest concentration of FLT. In contrary, production of ethylene at 15 μM FLT decreased. Peak of 1-aminocyclopropane-1-carboxylic acid (ACC) concentration in control cells forewent the ethylene peak. FLT affected significantly the content of abscisic acid.

Key words: BY-2, fluoranthene

Acknowledgments: GAČR (522/09/0239), IGA 19/2009

**MATHEMATICAL AND STATISTICAL ANALYSIS OF THE
MAGNITUDE OF NITROGEN AS ONE OF THE NUTRIENTS
OF INDUCTIONAL MEDIUM BY TUBERIZATION OF POTATO
IN VITRO**

Štěpán Z., Klemš M.

Department of Plant Biology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: klems@mendelu.cz

ABSTRACT

This work deals with the mathematical analysis of induction of tuber formation under different levels of nitrogen sustenance of potato plants by method *in vitro*, the aim is to clear that if nitrogen in this conditions inhibits or induces the tuber formation. Stem nodal segments of potato plants were cultivated *in vitro* 9 weeks on Murashige-Skoog medium containing modified level of inorganic nitrogen ($10 \div 12 \mu\text{M}$, $40 \mu\text{M}$ and $65 \div 70 \mu\text{M}$), 80 g.l^{-1} sucrose and 10 mg.l^{-1} benzylaminopurine. It was also considered the influence of external factors and allocation of the nutrients and mineral substances to the process of tuber formation. Cultures with low nitrogen level in induction medium showed higher frequency of tuber formation. Results were processed by statistic method like two-factor analysis of variance, Tukey's test was used in conjunction with the ANOVA to find which means are significantly different from one another and non-parametric Friedman's test was used with multiple comparisons according to Nemenyi. For determination parameters of well taken regression function was used least squares method. These evaluations confirmed correct hypothesis about nitrogen sustenance on the induction of potato tuber formation. Results were processed by statistic and mathematical methods.

Key words: Tuber formation, potato plant, abscisic acid, mathematical and statistic methods, term of adjustment for tuber formation.

Acknowledgements: This research was supported by the Grant Agency of AF MUAF Brno (IGA 19/2009).

BREEDING OF TRITICALE FOR BETTER BREAD-MAKING QUALITY USING DNA MARKERS

Trebichalský A.¹, Martinek P.², Balážová Ž.¹

¹Department of Biochemistry and Biotechnology, Faculty of Biotechnology and Food Sciences, Slovak University of Agriculture in Nitra, Trieda Andreja Hlinku 2, 949 76 Nitra, Slovakia

²Agrotest fyto, s.r.o., Havlickova 2787, 767 01 Kromeriz, Czech Republic

E-mail: andrej.trebichalsky@afnet.uniag.sk

ABSTRACT

Triticale (*X Triticosecale* Witt.) is a man-made hybrid created by crossing wheat (*T. aestivum* L.) and rye (*Secale cereale*). Therefore, the genom of triticale includes wheat chromosomes (AABB) and rye chromosomes (RR). The most spread and grown triticales are hexaploids ($2n=6x=42$ AABBRR). In hexaploid triticale the rye genome replaces the D genome of bread wheat. This work is aimed at developing triticale lines usable in the production of leavened bakery products. Two breeding strategies are employed that are based on various methods of Marker Assisted Selection (MAS) for detection of HMW glutenin allele *Glu-D1d* subunits 5+10 in spikes progenies. The allele *Glu-D1d* originating from wheat chromosome 1D is transferred to triticale using some types of chromosome 1R: 1R.1D₅₊₁₀⁻¹, 1R.1D₅₊₁₀⁻², Valdy, Valdy LH, FC1 and FC2. Translocation donors of chromosome 1R for this purpose have been developed and provided by Prof. Adam Lukaszewski (University of California, Riverside USA). *Glu-D1d* allele greatly participates on bread-making quality in bread wheat because it achieves the highest Glu-score. The SPLAT-PCR have been used for analysis of HMW glutenin subunit *Glu-D1d*. Final product was detected using 50 bp length marker GeneRule. A total of 255 F₄-F₈ spike progenies derived from various crosses of a triticale cultivar x a translocation donor were tested. *Glu-D1d* allele was confirmed in 155 cases which represents 60.7%. Totally, in 78 progenies with translocation 1R.1D₅₊₁₀⁻² was detected allele *Glu-D1d*. Translocation with *Glu-D1d* allele was detected in 41 progenies. In F₈ generation we have analysed 22 samples with translocation Presto Valdy, *Glu-D1d* allele was confirmed in 20 cases (90.9%). As far as the translocation Valdy LH, *Glu-D1d* was detected in 12 samples (60% of all Valdy LH sample). This translocation has connection with spike length. FC1 translocation was found in 18 samples.

The development of triticale with bread-making grain quality will enable to extend the area planted with food cereals in worse soils where bread cultivars of triticale retain better amino acid composition.

Key words: triticale (*x Triticosecale* Witt.), bread-making quality, *Glu-D1d*, translocation

Acknowledgements: This project was supported by a VEGA project No. 1/0471/09.

Section – Animal Biology

USING OF DNA FROM DIFFERENT TISSUES OF RAPTORS (*FALCONIFORMES*) FOR STUDYING GENETIC DIVERSITY AND POPULATION STRUCTURE

Bryndova M., Kourkova L., Urban T.

Department of Morphology, Physiology and Animal Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00 Brno, Czech Republic

E-mail: xbryndov@node.mendelu.cz

ABSTRACT

The main aim of this study was to choose the most suitable tissues for isolation DNA, which could be used for the next analysis. The other aim was to test microsatellite markers and estimate genetic structure in the population of the peregrine falcon (*Falco peregrinus*) and the saker falcon (*Falco cherrug*). We used the dataset of 21 individuals, which was divided into two populations according to their species. The sample sizes were 14 individuals of the peregrine falcon and 7 individuals of the saker falcons living in the Czech Republic. DNA was extracted from different tissues (feathers, buccal swabs, skin, skin from the foot pads and claws) by JETQUICK® tissue DNA spin kit. Comparing all tissues in the electrophoresis gel feathers were the most useful for the next analysis. Detection of alleles of 5 microsatellites (NVH fp89, NVH fp13, NVH fp31, NVH fp92-1, NVH fp79-4) was based on the multiplex PCR reaction and the fragmentation analysis. We evaluated the standard statistical values (number of alleles, allele frequencies, polymorphism information content, theoretical heterozygosity, observed heterozygosity and F statistics). Our research will be continued with optimizing methods for 10 microsatellites panel and isolation DNA from museum specimens, which provides the study of genetic variability and diversity birds of prey throughout the time.

Key words: raptors, microsatellites, isolation DNA, population structure, genetic variability

Acknowledgments: This study was supported by IGA AF MZLU Brno, Czech Republic (project No. DP 4/2009).

INBRED HORSE - A SOCIAL LOSER? EFFECT OF INBREEDING ON SOCIAL BEHAVIOUR AND SOCIAL SUCCESS IN AN INBRED POPULATION OF DOMESTIC HORSES

Dubcová J.^{1,2}, Bartošová J.³, Kašpar M., Tykalová R.⁴, Komárková M.^{3,4}

¹Department of Zoology, Faculty of Science, University of South Bohemia, Branisovska 31, Ceske Budejovice, Czech Republic

²The National Stud in Kladruby nad Labem, 533 14, Kladruby nad Labem, Czech Republic

³Institute of Animal Science, Prague-Uhrineves, Czech Republic

⁴Faculty of Science, Charles University in Prague, Vinicna 7, Praha 2, Czech Republic

E-mail: JancaD@seznam.cz

ABSTRACT

We studied influence of inbreeding on social behaviour and social success of horses of limited population (about 1000 pedigrees) of a breed of Oldkladruby horse characterized by high level of inbred mating. Inbreeding generally has a negative impact on many various characteristics; therefore an influence also on behaviour could be expected. We hypothesized, that horses with higher level of inbreeding (1) should achieve lower dominance rank; (2) should initiate and participate in less both, agonistic and non-agonistic interactions; and (3) should stay at a greater distance from the herd compared to lower inbred horses. Seventy-one mares and their 113 foals (62 fillies, 51 colts) born within three seasons in National stud Kladruby nad Labem were observed in two periods; before and after abrupt weaning (at age of approx. 6 months). Following characteristics of social behaviour were examined: dominance status of the mare, distance of the mare/foal from the herd and foal's distance from its mother (before weaning) and distance of the foal from the herd, its dominance status and interactions with other weanlings (after weaning). Inbreeding levels in horses were calculated according to Wright (1922, Am. Nat. 56: 330-338) (10 generations of ancestors, range 1.22-18.71). Dominance rank of horses was assessed in two ways, according to Clutton-Brock et al. (1982, Nature 350: 178-180) and using dyadic relationships between group members. Horse's distance from the herd was scanned each 15 minutes (2x12 hours in each period). Social interactions among weanlings were recorded continuously (2x2 hours of focal observation for each foal). Level of inbreeding affected none of the tested variables except of a tendency of more inbred foals to stay at greater distance from the herd after weaning ($\chi^2(1)=3,29$, $p<0,07$, logistic regression, PROC GENMOD, SAS). Conclusion: High level of inbreeding in a foal caused neither its fundamental problems in social integration nor altered social behaviour towards other horses.

Key words: horse; *Equus caballus*; inbreeding; social behaviour, dominance status

GENOTYPING OF *CLOSTRIDIUM DIFFICILE* FROM PATIENTS WITH SUSPECT INFECTION CDAD (*CLOSTRIDIUM DIFFICILE* ASSOCIATED DISEASE)

Ďud'áková E.¹, Gálová Z.¹, Melter O.²

¹Department of Biochemistry and Biotechnology, Faculty of Biotechnology and Food Sciences, Slovak University of Agriculture, A. Hlinku 2, 949 76 Nitra, Slovakia

²Department of Medical Microbiology, 2nd Faculty of Medicine, Charles University in Prague, V Úvalu 84, 150 06 Praha 5, Czech Republic

E-mail: lubica.dudakova@centrum.sk

ABSTRACT

Clostridium difficile is a gram-positive anaerobic, spore-forming rod. During its vegetative growth it produces toxins, which can cause infection commonly manifested as mild-to-moderate diarrhoea. These diseases often start as nosocomial infections connected with antibiotic therapy, which is the key factor that alters the colonic flora and supports colonisation by *Clostridium difficile*. The phenomenon of nosocomial infections by *Clostridium difficile* has been described in horses, as well in humans. Firstly, the toxin production in faecal samples was tested by EIA method. Further, the DNA was isolated using CHELEX by Rupnik (<http://www.mf.uni-mb.si/mikro/tox/>) and then the presence of *ctdB* gene was monitored to confirm the production of binary toxin. Subsequently, the typization of toxins based on RFLP method (*restriction fragment length polymorphisms*) was used. The Rupnik's protocol (<http://www.mf.uni-mb.si/mikro/tox/>) was used for evaluation of polymorphism of the restriction fragments as well. Then, the ribotypes of analysed strains were set by comparison of the obtained profiles and collection strains, and by the Bidet's ribotyping method (Bidet, 1999)

Thirty-five samples of DNA were tested for the presence of binary toxin. Binary toxin was detected in 9 strains (25.7%), remaining 26 (74.3%) of the samples showed negative result in this testing. From the 35 tested samples 3 strains (8.6%) belonged to the toxinotype I, 4 strains (11.4%) to the toxinotype II, 11 strains (31.4%) to the toxinotype VIII, 5 strains (14.3%) to the toxinotype X, and 4 strains (11.4%) to the toxinotype XI. Only in 1 strain (2.9%) the toxinotype XIV was detected and 1 strain (2.9%) showed the presence of the toxinotype XII. The presence of the toxinotype III was not confirmed. This method was not successful in typisation of 6 strains (17.1%). By ribotyping the occurrence of ribotypes was confirmed as follows: 033 – 1 strain (2.9%), 036 – 5 strains (14.3%), 047 – 11 strains (31.4%), 070 – 1 strain (2.9%), 102 – 3 strains (8.6%), 103 – 4 strains (11.4%) and 111 – 1 strain (2.9%). Hypervirulent ribotypes 027 and 078 were not detected.

Key words: *Clostridium difficile*, nosocomial infection, toxins, ribotyping, toxinotyping

THE IGF2 AND NAMPT GENE POLYMORPHISMS AND ASSOCIATIONS WITH PERFORMANCE TRAITS IN CZECH LARGE WHITE PIG BREED

Chalupová P., Weisz F., Knoll A., Urban, T.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: xchalup1@mendelu.cz

ABSTRACT

Performance traits are crucial for pork production efficiency. Paternally expressed insulin-like growth factor 2 (IGF2) has influence to development and growth. Nicotinamide phosphoribosyltransferase (NAMPT/PBEL/visfatin) gene plays an important role in lipid metabolism. The aim of this work was to test chosen polymorphisms in these genes in current Czech Large White pig population and analyze their influence to various performance traits. In total 98 sows were tested by PCR-RFLP for NciI polymorphism in IGF2 gene and for HpaII polymorphism in NAMPT gene. Allele frequencies were 0.82/0.18 (C/G) and 0.51/0.49 (C/T) in IGF2 and NAMPT respectively. CG genotype (IGF2), was associated with higher reproduction parameters breeding value ($P \leq 0.05$), when compared to CC. No significant differences were found between NAMPT genotypes. In analysis of gene association a interaction was CC/CC (NAMPT/IGF2) associated with higher backfat thickness ($P \leq 0.01$) when compared to CT/CC. Genotype CC/CC was associated with lower lean meat content ($P \leq 0.05$) when compared to CT/CC. Genotype TT/CC was associated with higher average daily gain breeding value when compared to CT/CC ($P \leq 0.01$), CT/CG and TT/CG ($P \leq 0.05$). Genotype CC/CG was associated with higher reproduction parameters breeding value when compared to TT/CC ($P \leq 0.01$) and CT/CC ($P \leq 0.05$). Moreover, genotype CT/CG was associated with higher reproduction parameters breeding value when compared to TT/CC ($P \leq 0.05$). Results should be verified in other populations.

Key words: pig, performance traits, *IGF2*, *NAMPT*, polymorphism, association

Acknowledgments: This study was supported by the IGA No. 16/2009

ASSOCIATION OF SINGLE NUCLEOTIDE POLYMORPHISMS IN TG, LEP AND TFAM GENES WITH CARCASS TRAITS IN CROSS-BREED CATTLE

Kaplanová K., Dvořák J., Urban T.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: KKaplanova@seznam.cz

ABSTRACT

The objective of this preliminary study is to determine the genotypes of genes using for Marker Assisted Selection for meat quality and to assess the association of single nucleotide polymorphisms in these genes in cross-breed *Bos taurus* cattle. For this study the previously reported polymorphisms in genes thyroglobulin (*TG*), leptin (*LEP*) and mitochondrial transcription factor A (*TFAM*) were chosen due to their possible association with marbling and carcass traits in cattle.

Analysed carcass traits were following: kidney and pelvic fat, netto gain, weight of tenderloin and weight of rib eye. A crossbred population of 109 animals (Czech Spotted Cattle, Holstein, Red Holstein, Ayshire) was developed in Research Institute for Cattle Breeding, Ltd. in Rapotín. The analysed polymorphisms were determined by PCR-RFLP.

Present study shows no significant associations of the SNPs in *TG* and *TFAM* genes for any traits, on the other hand significant association between genotype *CT* in exon 2 of *LEP* gene and deposition of kidney and pelvic fat ($P < 0,05$) was observed. This result suggests that allele *T* is responsible for higher fat deposition. Other association of SNP in *LEP* gene shows significant difference between genotype *CC* a *CT* and netto gain ($P < 0,05$) and high significant difference between genotype *CC* and *CT* ($P < 0,01$) – it would mean that heterozygous genotype is undesirable. Our results can be influenced by low number of tested animals or by unequal genotype distribution in selected population (*LEP* gene) and by analysed traits; there were only the information from slaughter about carcass.

The obtained results suggest possible using these genes in next part of project because of their significant association (*LEP* gene) or their previously presented associations (*TG* and *TFAM* gene). It is possible that it will be found a significant association between genotypes of these genes and marbling (intramuscular fat content) and other meat quality characteristics which will be analysed in the next part of our project with higher number of animals.

Key words: *TG*, *LEP*, *TFAM*, meat quality, cattle

Acknowledgments: This project is supported by Ministry of Education, Youth and Sport project No. 2B08037.

MATERNAL INVESTMENT AND REPRODUCTION STRATEGY IN THE DOMESTIC HORSES (*EQUUS CABALLUS*)

Komárková M., Bartošová J., Dubcová J.

Institute of Animal Science, Prague-Uhrineves & Faculty of Science, Charles University in Prague, Czech Republic

E-mail: eto89@seznam.cz

ABSTRACT

Suckling, the main part of maternal investment in equids, is crucial for development and social success of the foal. As such it is of great importance in horse breeding. We examined effects of: age and sex of the foal, age, parity, pregnancy and rank of the mother and sex of the foetus if the mother was pregnant. Further the degree of inbreeding of each mare was added. Four variables describing suckling behaviour were modelled: suckling duration and frequency, proportion of suckling attempts rejected and terminated by the mother and suckling terminated by another mare. Behavioural observations were conducted at the National Stud Kladruby nad Labem. Eight groups of loose housed mares with foals were observed from deliveries to abrupt weaning. The value of the inbreeding index was taken from the stud records. In total, we recorded 10 607 suckling solicitations of 79 foals from 59 mothers. Probability that mother reject the suckling bout was influenced by interaction between foal's age and its sex ($P < 0.05$). A mother terminated suckling bouts to her foal with lower probability as a nursed foal matured ($P < 0.0001$), no matter of its sex, but mares with female foetuses tended to terminate suckling bouts more often than non-pregnant ones or those bearing males ($P = 0.05$). Suckling bouts terminated by a mother were shorter when she was not pregnant compared to those bearing either male or female foetuses. Mares who frequently terminated suckling bouts to their herdmates were higher ranked ($P < 0.05$) and pregnant ($P < 0.001$). Suckling bouts duration decreased as the foal matured ($P < 0.0001$), it increased with higher dominance rank of the mother ($P < 0.01$) and differed also among groups ($P < 0.01$). Any of analyzed variables except the suckling attempts rejected by the mother was affected by the degree of inbreeding. Mothers rejected suckling attempts the more, the less inbred they were ($P < 0.02$). The termination of suckling bouts could serve the mares for different allocating their resources with respect to their concurrent investment in two offspring when being pregnant during lactation, while rejection of suckling solicitation rather reflected different approach to maternal care provided either to male or female foals. In conclusion, in loose housed mares of domestic horse with foals we have found no detrimental effect of any of literally cited factors on suckling behaviour.

Key words: horse, suckling, inbreeding, dominance, pregnancy

Acknowledgments: We would like to thank to people from the National stud Kladruby nad Labem and Jitka Komárková and Marta Komárková for their field assistance. The project was supported by the Ministry of Agriculture of the Czech Republic (MZc0002701404) and NAZV QH92265.

EFFECTS OF GENOTYPE LEPR ON PRODUCTION TRAITS IN PIGS**Kováčik A.¹, Bulla J.¹, Trakovická A.²**

¹Department of Animal Physiology, Faculty of Biotechnology and Food Sciences, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia

²Department of Genetics and Breeding Biology, Faculty of Agrobiolgy and Food Resources, Slovak University of Agriculture in Nitra, Tr. A. Hlinku 2, 949 76 Nitra, Slovakia

E-mail: anton.kovacik@yahoo.com

ABSTRACT

The aim of this work was to analyze productive traits of pigs following polymorphism of *LEPR* gene. For experiment we used 102 young boars (50) and sows (52) of hybrid combination of Large White and Landrace breed. Genetic polymorphism both of genes was detected by PCR-RFLP. The PCR product was digested with *HpaII*. Three types of genotypes AA (14), AB (32) and BB (56) were confirmed in the set of pigs. The following polymorphism information content was found: PIC = 0.3249. AB genotype showed the highest average daily gain (ADG = 604.29 ± 24.23). The AA genotype showed statistically significant backfat thickness, which was the highest (BFT = 10.77 ± 0.43), but the proportion of lean meat was the lowest (LM = 57.64 ± 1.18). Genotype BB was characterized by the highest proportion of lean meat (LM = 59.98 ± 2.25) and the lowest backfat thickness (BFT = 8.98 ± 0.53) compared to the other genotypes. Regarding the tested parameters the most convenient is the genotype BB.

Key words: pig, polymorphism, *LEPR* gene, productive attributes

Acknowledgments: This work has been supported by VEGA project 1/0834/08 and 1/4440/07

DETERMINATION OF DECLARED QUALITATIVE CHARACTERISTIC AND IDENTIFICATION OF ANIMAL NUCLEIC ACID IN FEEDSTUFFS

Nesvadbová M.¹, Vašátková A.², Knoll A.¹, Zeman L.²

¹Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

²Department of Animal Nutrition and Forage Production, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: xnesvadb@node.mendelu.cz

ABSTRACT

This work is part of a project “Determination of declared qualitative characteristic AND identification of animal nucleic acid in feedstuffs – seminar for students” from grant agency of Ministry of Education, Youth and Sports of the Czech Republic. The aim of this project is to acquaint the students of bachelor, master and Ph.D. degree at Mendel University of Agriculture and Forestry in Brno with analysis methods of feedstuff for dog. This report summarizes workflow of arrangement of our project. We chose the various feedstuffs for dog that were currently on the market. We determined declared qualitative characteristic by the help of chemical analysis and we identified of animal DNA by polymerase chain reaction (PCR) in feedstuffs. The chemical and molecular analysis of granulated feedstuffs showed that composition is mostly corresponding with guaranteed analysis of manufacturer. But in tinned feedstuffs were found significant differences. Declared qualitative characteristic are not corresponding with guaranteed analysis of manufacturer and PCR reaction revealed that the some tins don't contain the kind of meat which are guarantee of manufacturer. The results of this project will be exploited for seminar for students and also research.

Key words: Feedstuff, Dog, Declared qualitative characteristic, Species identification, Polymerase chain reaction.

Acknowledgments: This work is supported by Ministry of Education, Youth and Sports of the Czech Republic FRVŠ no. 1305/2009.

OVERWINTERING OF SPIDERS IN EMPTY LAND-SNAIL SHELLS IN XERIC HABITATS OF SOUTHERN MORAVIA

Niedobová J., Hula V.

Department of Zoology, Fisheries, Hydrobiology and Apiculture, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: Naaudia@seznam.cz

ABSTRACT

Our first objective was to find, which species of spiders overwinter in the land-snail shells in the xeric habitats of Southern Moravia (Czech Republic). During the winter 2008/2009 we collected 2448 empty land-snail shells from 31 xeric localities. Land-snail shells were represented by three species from three genera (*Cepea*, *Helix* and *Helicella*). Altogether we have found 185 specimens of spiders – 148 adults and juvenile spiders which were determinable (belong to 19 species and 9 families) and 37 juvenile spiders (determined to family or genus level only). Some rare species were found, which are under Red list of threatened species in the Czech Republic (four vulnerable and two endangered species). The most important record is one juvenile gnaphosid spider *Phaeoedus braccatus*, which was known from three historical localities only. We confirmed positive affinity of several species to empty land-snail shells, particularly *Pellenes tripunctatus*, *Pellenes nigrociliatus*, *Sitticus pennicilatus* and *Myrmarachne formicaria* which we collected in big numbers of individuals from several localities.

Our second aim was to find which environmental factors could influence spiders fauna in investigated localities. For all localities we have collected environmental data about geographical orientation, geological base, conservation site management, cover and origin of locality. Whole dataset was computed by program CANOCO. CCA analyses didn't showed significant affinity of any spider species to management, species of land-snail or other environmental characteristics. All models were computed under 999 permutation by Monte-Carlo permutation test.

Key words: spiders, land-snail shells, overwintering, xeric habitats

Acknowledgments: This study was supported by IGA-AF-MZLU-IG289151 and VaV-MZP-CR-SP/2D4/59/07. We would like to thanks to following friends who help us: Ondřej Košulič, Zdeněk Foltýnek Fric and Lukáš Suszka.

THE STANDARDIZATION OF RADIOSPECTROMETRIC ASSESSMENT OF RADIOCESIUM (^{137}Cs) IN FISH *IN VIVO* IN A MODEL AQUATIC ENVIRONMENT**Růžičková E.**

Department of Molecular Biology and Radiobiology, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: xruzic13@mendelu.cz

ABSTRACT

Activities of radiocesium (^{137}Cs) in organisms occurring in all the affected aquatic ecosystems considerably fluctuated after the Chernobyl (1986) accident. After a certain period of time a relative balance of the radionuclide was seen in the aquatic environment, but all the same the content of radiocesium in the organisms differed considerably. The model environment in an aquarium with definable conditions can provide new information about the biological accumulation of ^{137}Cs in the vegetation and in living organisms, and about the transfer indicators between the individual compartments of the aquatic environment.

This work was focused on the standardization of a *in vivo* radiospectrometric assessment of ^{137}Cs in small aquarium fish using the gamma-spectrometric system with a pure germanium (HPGe) detector.

Key words: radiocaesium, aquatic environment, fish, *Poecilia reticulata*

Acknowledgments: This work was supported from the institutional financial resources of the Faculty of Agronomy of the Mendel University of Agriculture and Forestry in Brno

DEGRADATION OF NUCLEIC ACIDS IN VARIOUS LABORATORIAL CONDITIONS

Sedláčková T., Knoll A., Svobodová K.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: sedlact@seznam.cz

ABSTRACT

The aim of this study was to gather knowledge about the degradation of nucleic acids due to laboratory conditions. The work was focused on deoxyribonucleic acid and ribonucleic acid. The study factors were temperature (20, 5, -20 and -70°C), time (0-4 weeks) and the input concentration of nucleic acid. For the DNA analysis the PCR product included selected sequence of *EEF1a2* gene was used. The sample of RNA was isolated from pig muscle. For the analysis PCR resp. Real-time PCR were used and optimized. The results were evaluated by Ct values obtained from real-time PCR reaction. To monitor the degradation (quantity and quality) of RNA resp. rRNA the agarose gel electrophoresis was used. The DNA samples stored in 20 °C was completely degraded after the first week but in other temperatures only slightly. The rRNA samples stored in the room temperature were also completely degraded after one week. Based of our results, the nucleic acids are best preserved at temperatures 5, -20 and -70 °C. Inappropriate storage of nucleic acids could result in degradation and subsequently in wrong results therefore.

Key words: degradace, nukleové kyseliny, real-time PCR

INNERVATION OF UTERINE WALL IN ASPECT OF MUSCULAR LAYER CONTRACTION IN CAT'S REPRODUCTION CYCLE

Sobczyk I.¹, Kuroпка P.², Szyszkowska A.¹

¹Department of Animal Nutrition and Feed Science, Faculty of Biology and Animal Science, Wrocław University of Environmental and Life Sciences, 25/27 C. K. Norwida Street, 50-375 Wrocław Poland

²Department of Animal Anatomy and Histology, The Faculty of Veterinary Medicine, 1 Kozuchowska Street, 51-631 Wrocław, Poland

E-mail: iga.sobczyk@up.wroc.pl

ABSTRACT

Female cats are seasonally polyestrous, which means they may have many periods of heat. The season was beginning in January or February and ending in late October. The adult cat is seasonally polyestrous, cycling repeatedly throughout the breeding season, unless interrupted by pregnancy or illness. Several major phases compose the estrous cycle, and variations in the level of normal circulating hormones contribute to these different phases (proestrus, estrus, diestrus, anestrus, nonestrous). Proestrus is the period that precedes estrus when males are attracted to nonreceptive females. Nonestrous is the period of hormonal inactivity. The innervation of uterine wall depends on the phase of the reproductive cycle. Cat's reproductive cycle is stimulated by the longer period of daylight as winter turns to spring and is regulated by hormones produced both in the brain and in the ovary. These hormones not only produce the changes in the reproductive organs needed for pregnancy but also cause some dramatic departures in cat's normal behavior. Hormones influence fertility and reproductive behavior in both the dog and the cat, although their heat and reproductive cycles vary depending on environment on sexual behavior.

In cats, mating behavior is required to induce ovulating. Domestic cats usually reach sexual maturity (puberty) between five to 12 months, at which time they experience their first estrus. The ovulation is the liberation of one or more ova from the ovaries to the oviduct and the fecundating is the moment in which the spermatozoa join with the free ova. It is fundamental to indicate that the female cat, in contrast with female dog, does not have a spontaneous ovulation. This ovulation is induced by the mating.

Key words: innervation, cat reproduction cycle

THE INFLUENCE OF PITFALL TRAPS ON THE SOIL EPIGEAL FAUNA

Šafář J., Hula V., Šťastná P., Vítková Z.

Department of Zoology, Fisheries, Hydrobiology and Apiculture, Faculty of Agronomy, Mendel University of Agriculture and Forestry Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: jardasafar@centrum.cz

ABSTRACT

The thesis deals with the influence of ground traps on the soil epigeal fauna. The results are compared with those in the bachelor thesis researching into the quantitative and qualitative evaluation of the most frequently used types of ground traps through the use of the so-called Latin Quarter, which in the total number of 81 pieces of traps demonstrates the differences between the traps. The Latin Quarter, which was also used for the needs of this thesis, used three kinds of preserving agents (formaldehyde, ethylene glycol and salt concentrate) and three kinds of marquises over the used Barber trap (one made of plexiglass, one without a marquise or a wooden board laid on the vegetation over the trap). The experiment was carried out at the locality of Kameničky, near the Žďárské vrchy protected landscape area, with an only collection from the ground traps between 30th April and 5th June 2008. A redund analysis (RDA) from the Cannoco package was used for the statistical evaluation.

Through the use of the Latin Squares, differences in the reaction to the preserving agent were noted. An attractive influence of formaldehyde on several species of the studied target order Carabidae was proved. *Poecilus cupreus*, *Amara lunicollis*, *Pterostichus diligens* and *Bembidion guttula* were trapped in higher numbers. Ethylene glycol was attractive for *Carabus granulatus*.

Key words: Carabidae, pitfall trap, formaldehyde, ethylene glycol, salt

ASSOCIATION BETWEEN LACTOFERRIN GENE POLYMORPHISM AND BOVINE MAMMARY GLAND INFLAMMATION

Šrubařová P., Dvořák J.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: s.petra@volny.cz

ABSTRACT

Lactoferrin, glycoprotein, plays an important role in defense mechanism of mammary gland of milk producing animals. The amount of lactoferrin increases during inflammatory process and viral infections. *Lactoferrin* gene (*LTF*) is localized on the 22q24 bovine chromosome. In locus of *LTF* gene two different allelic variants were mapped. These variants code three different genotypes – *AA*, *AB* and *BB*. Genotype *AA* is associated with lower somatic cell count, genotype *AB* with higher somatic cell count. It was confirmed that *LTF* gene can be used as a genetic marker for somatic cell concentration in milk and as a marker for susceptibility/resistance to mastitis in dairy cows. Mastitis is one of the main reasons of decreasing cow's milk quality. Mastitis has an influence to composition and technological properties of milk. The aim of this study was to analyze *lactoferrin* gene polymorphism and evaluate interactions between genotypes of this gene and selected traits in chosen group of dairy cattle.

DNA was isolated from milk (n=49) using JETQUICK Blood & Cell Culture DNA Spin Kit (Genomed GmbH, Germany). PCR was performed according to SEYFERT and KUHN (1994). PCR product was restricted by *EcoRI*, fragments were visualized on 3% agarose gel. Genotypes were associated with somatic cell count, yield of milk and lactation. Data were processed by Proc GLM SAS 9.1.4. Two genotypes of *LTF* gene were found in this study: *AA* and *AB*, of frequencies equal to 57.14% and 42.86%, respectively. Genotype *BB* was not detected. It was established that no statistically significant association exist between the somatic cell count and *LTF* genotype, lactation and yield of milk. Some of the reasons of differences between studies could be different amount of animals, variation in frequencies of genotypes and alleles and fact that mastitis is multifactorial disease caused especially by pathogens. According to results of this study *lactoferrin* gene cannot be used as a marker for resistance/susceptibility to mastitis in dairy cattle.

Key words: *Lactoferrin* gene, Mastitis, Somatic Cell Count

Acknowledgments: Author would like to thank Anna Zielak-Steciwo from Institute of Animal Breeding, Faculty of Biology and Animal Science, University of Environmental and Life Sciences in Wrocław, Poland, for helpful advice and cooperation. This study was supported by Ministry of Agriculture of the Czech Republic (project No. 1G58073).

IDENTIFICATION OF A POSSIBLE NEW WAP ALLELE IN A ROMANIAN LOCAL PORCINE BREED

Șuteu M., Vlaic A., Balteanu V., Pop F., Pauliuc S.

Animal Genetics, Faculty of Animal Sciences and Biotechnologies University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 3 - 5 Manastur Street, 400372, Cluj-Napoca, Romania

E-mail: suteu_usamv@yahoo.com

ABSTRACT

In the milk of almost all livestock species there are six major milk proteins. Four of them belong to the casein fraction (α s1-, α s2-, β - and κ -casein) and two are whey proteins (β -lactoglobulin and α -lactalbumin). In porcine milk a third major whey protein was discovered named whey acidic protein (WAP).

WAP is the major whey protein in the case of mouse, rat, rabbit and camel milk. This protein has only recently been identified in sow's milk. The mature protein contains 113 amino acids (aa), has a molecular mass of 22985.86 Da and an isoelectric point $pI=5.04$ (signal peptide not included – 19 aa). The accession number of this protein in Swiss-Prot data base is O46655. The gene encoding porcine WAP has a length of 2087 bp (Genbank accession number AF3200306) and has been localized using FISH in the telomeric region of the two chromosomes 18.

The purpose of our study was to use the isoelectric focusing technique (IEF) in order to investigate milk protein polymorphisms in porcine breeds reared in Romania, in order to detect new genetic variants. Using this technique we have previously identified a polymorphism in the β -casein region of the gel, two variants (A and B) being reported.

In this paper, using IEF, as described in our previous studies, we report a polymorphic variant in the case of porcine WAP. The milk sample which contains this new variant belongs to a Mangalita breed individual (a local Romanian porcine breed). Studies at DNA level are in progress in order to characterize this new porcine WAP variant, which has been named: B^{MS}.

Key words: WAP, porcine milk, milk proteins, isoelectric focusing, polymorphism

GENETIC DIVERSITY IN CAUCASIAN SHEPHERD AND CZECH TERRIER DOG BREEDS USING MICROSATELLITE LOCI

Truksa M., Urban T., Putnová L.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: miloslav.truksa@seznam.cz, urban@mendelu.cz

ABSTRACT

Genetic variability of two dog breed, Caucasian Sheperd Dog and Czech Terrier was analyzed using a set of ten microsatellites. Caucasian Shepherd Dog is large and ancient population and Czech terrier is modern dog breed, its origin is clear. The Caucasian Sheperd Dog genetic variability was found very high, as it was expected. The Czech Terrier genetic variability was lower, but enough high for next breeding and unexpectedly variable when it was created with high degree of inbreeding.

Key words: Dog, *Canis familiaris*, diversity, inbreeding, microsatellites, genetic variability

Acknowledgments: This study was supported by IGA MZLU no. 21/2007.

ATYPICAL COMMUTING FLIGHTS OF FEMALES MOUSE-EARED BAT (*MYOTIS MYOTIS*) IN THE UNDERGROUNDS OF THE „NIETOPEREK“ BAT RESERVE (WESTERN POLAND)**Wawrocka K., Kokurewicz T.**

Institute of Biology, Wrocław University of Environmental and Life Sciences, Kożuchowska 5b, 51-631 Wrocław, Poland

E-mail: kamila.freeme@gmail.com

ABSTRACT

The observations were made in the underground fortifications of the Międzyrzecz Fortified Front (MFF) (Western Poland) during preparation of Management Plan of Natura 2000 site PLH080003 "Nietoperek". Heretofore daily migrations of mouse-eared bat between maternity colony and foraging areas were noticed as fast flights (max. 50km/h) occurring ca. 10 m aboveground. Our observations made by use of radio-tracking and bat counts performed both under and aboveground made possible to identify atypical commuting flights taking place in the corridors of underground fortification system. The main benefits of underground flights could be: (1) predation avoidance, (2) increase the time of foraging by starting the emergence before darkness and (3) saving energy by avoiding flights in unfavourable weather conditions. The results show high adaptations abilities of this species.

Key words: *Myotis myotis*, radio-tracking, commuting flights, Natura 2000 site "Nietoperek"

Acknowledgments: We are very grateful to Marcin Rusiński ("ANSEE " Consulting, Poland), Jan Boratyński (Poznań University of Life Sciences, Poland) John Haddow (Auritus Wildlife Consultancy Ltd, UK), Joanna Nalewalska (Wrocław University, Poland) for invaluable help during the field study.

ANALYSIS OF *SERPINE1* GENE VARIABILITY IN PIGS

Weisz F., Knoll A.

Department of Animal Morphology, Physiology and Genetics, Faculty of Agronomy, Mendel University of Agriculture and Forestry in Brno, Zemedelska 1, 613 00, Brno, Czech Republic

E-mail: filipw@seznam.cz

ABSTRACT

SERPINE1 gene encodes for plasminogen activator inhibitor-1 (*PAI-1*) which plays a key role in incidence of thrombosis and atherosclerosis in human. Porcine *SERPINE1* or *PAI-1* gene is localised on porcine chromosom 3 near to QTL for fatness. The aim of study was to describe genetic structure and polymorphisms of intron 3 and CDS of *SERPINE1* gene in pigs. In our study we sequenced intron 3 and deposited the sequence to EMBL (accession number FN396538.1).

Thank comparative sequencig of intron 3 in breed Meishan, Wild Boar and Piétrain we found 15 SNPs and 1 indel. For next study FN396538:g.566G>A was chosen. SNP was determined in 98 pigs Czech Large White breed by MbiI PCR-RFLP and frequencies of allele A and G were 0.66 and 0.34, respectively. The association study with FN396538:g.566G>A and production traits (average daily gain, backfat thickness, lean meat content) was proceeded but no significant difference between genotypes of SNP and analysed traits was found.

In next part we have sequenced cDNA of *SERPINE1* gene from 2 pigs breed Meishan and 2 pigs Wild Boar. We have observed 5 SNPs in CDS and 1 of them changes amino acid in protein structure. Consequently we have sequenced this SNP summary from 15 Czech Large White, 15 Wild Boar, 15 Duroc, 15 Landrace and 12 Piétrain pigs. The SNP which changes amino acid in protein structure will be examined in next part of our study.

This gene is very important in human medicine and it is associated with obesity and fat deposition. One reason why we can study this gene is its function and effect for human. On the other hand our results may be used for linkage mapping of porcine chromosome 3 and detected polymorphisms will be used for more extensive association study with fat deposition in pigs.

Key words: *SERPINE1*, *PAI-1*, SNP, pig

Acknowledgments: This work was supported by Czech Science Foundation (Project No. 523/07/0353).

