

EXCERPTA
VETERINARIA
LUBLIN

Vol. 50 (2011) UNIVERSITY OF LIFE SCIENCES IN LUBLIN 2012

PUBLISHED ANNUALLY
BY
THE FACULTY OF VETERINARY MEDICINE

Editor
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ISSN 2080-914X

WYDAWNICTWO UNIwersytetu PRZYRODniczego w LUBLINIE

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Preface

The present periodical „Excerpta Veterinaria Lublin” is published in order to acquaint the reader with the life of the Veterinary Medicine Faculty in Lublin, and with the scientific works done there. The periodical is yearly publication which includes summaries of doctoral and habilitation dissertations and experimental and casuistic papers, as well as titles of other publications issued during the proceeding year.

It is addressed to foreign colleges and institutes and is issued in virtue of interchange law.

Proposals of an exchange programme should be sent to the address :

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FACULTY OF VETERINARY MEDICINE LUBLIN 2011

Structure

Veterinary Medicine Faculty belongs to one of seven Faculties of the University of Life Sciences in Lublin. At present, this Faculty consists of 1 Institute, 9 Departments. The Faculty is entitled to confer scientific degrees: i.e. the degree of Doctor of Veterinary Science and the second, a higher one Doctor habilitated.

Staff of Faculty

Dean is the head of the Faculty directing all the scientific and didactic activities. Of two vice-Deans one is especially responsible for the course of teaching and student affairs and the second one for clinical affairs.

Dean: Prof. ordin. Dr. habil. Stanisław Winiarczyk

Vice-Dean: Prof. ordin. Dr. habil. Cezary Kowalski

Prof. extraordin. Dr. habil. Piotr Silmanowicz

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Prof. extraordin. Dr. habil. Zygmunt Wrona
Prof. extraordin. Dr. habil. Grażyna Ziółkowska
Dr. habil. Urszula Kosior-Korzecka
Dr. habil. Izabela Krakowska
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Dr. habil. Jacek Madany
Dr. habil. Barbara Majer-Dziedzic
Dr. habil. Zygmunt Nowakowski
Dr. habil. Iwona Puzio
Dr. habil. Marek Szczubiał
Dr. habil. Marcin Tatara
Dr. habil. Renata Urban-Chmiel
Dr. habil. Jose Luis Valverde Piedra

Assistants, adjuncts and lecturers: 92

Technicians: 53

Received the degree of Doctor of Veterinary Science: 3

Received the degree of Doctor habil.: 0

Students: 1119

Received the diploma of veterinary surgeon: 139

Attention

Dr. – Doctor of Veterinary Science – corresponds to Ph.D.

Dr. habil. – the highest scientific degree

Prof. Dr. habil. – employed on the post of professor of the University of Life Sciences

Prof. extraordin. – corresponds to the title of associate professor

Prof. ordin. – corresponds to the title of full professor

Veterinary study continues for five and half years now and has an unitary character. A graduate after completing studies and passing exams receives the diploma of veterinary surgeon.

The schedule of studies

Subject	Number of hours		Semestr	Course completion
	Lecture	Classes		
1	2	3	4	5
Latin	-	45	I, II	C**
Biophysics	15	30	I	E*
Chemistry	15	30	I	E
Biology	30	30	I	E
Histology and embriology	60	60	I, II	E
Animal anatomy	90	135	I, II, III	E
Foreign language	-	150	I, II, III, IV, V	E
Genetical basis of animal breeding	15	30	II	E
Philosophy	15	30	II	C
Informatics and statistical elements	30	30	II	C
Physical education	-	60	I, II	C
Biochemistry	60	90	II, III	E
Sociology	30	-	III	C
Bioethics	30	-	III	C
Molecular biology***	15	15	III	C
Environmental physiology***	15	15	III	C
Agronomy	15	-	III	C
Animal husbandry	15	30	III	E
Animal physiology	60	60	III, IV	E
Topographic anatomy	15	30	IV	E
Environmental protection	15	15	IV	E
Animal nutrition	30	30	IV	E
Economacs of agriculture	15	-	IV	C
History of vet. medicine and deontology	15	-	IV	C
Laboratory animals diseases	15	15	IV	C
Veterinary microbiology	60	90	IV, V	E
Pathophysiology	45	60	V, VI	E
Veterinary toxicology	30	30	V	E
Feed hygiene***	15	15	V	C
Exotic animals diseases	15	15	V	C
Clinical diagnostics	30	60	V, VI	E
Pharmacology	45	60	V, VI	E
Beneficial insect diseases	15	15	VI	E
Clinical immunology	15	15	VI	E
Pathological anatomy	75	90	VI, VII, VIII	E
Parasitology and invasiology	30	60	VI, VII	E
Game animal diseases	15	15	VI	C
Clinical physiology***	15	-	VI	C
Fish husbandry and diseases	15	30	VII	E
Anaesthesiology	15	15	VII	E
Veterinary radiology	30	30	VII	E

1	2	3	4	5
Internal diseases of companion animals	30	60	VII, VIII	E
Epidemiology and zoonoses***	30	15	VIII	C
Veterinary pharmacy	15	15	VII	C
Clinical analyses	-	30	VIII	C
Veterinary ophthalmology***	15	15	VIII	C
Veterinary stomatology	15	15	VIII	C
Hygiene of milk	15	30	VIII	E
Veterinary dermatology	15	30	VIII	E
Fur animal diseases	15	15	VIII	C
Veterinary dietetics	15	15	VIII	E
Hygiene of slaughter animals and meat	45	60	VIII, IX	E
Veterinary prevention	30	45	VIII, IX	E
Veterinary surgery	60	90	VIII, IX, X	E
Animal welfare	15	15	IX	E
Poultry diseases	30	60	IX, X	E
Internal diseases of farm animals	60	60	IX, X	E
Obstetrics and gynaecology	90	90	IX, X, XI	E
Infectious diseases of animals	60	90	IX, X, XI	E
Hygiene of food of animals origin	60	75	X, XI	E
Veterinary oncology***	15	15	IX	C
Pediatrics***	15	15	IX	C
Geriatrics of accompanying animals***	15	-	X	C
Veterinary neurology***	15	-	X	C
Veterinary administration	30	-	XI	C
Forensic medicine	15	15	XI	E
Orthopedics	15	30	XI	E
Andrology and insemination	15	30	XI	E
Reproduction in horses***	15	15	XI	C
Marketing and management***	15	-	XI	C
Metabolic diseases of farm animals***	15	-	XI	C
Total	1680	2355	41E	
Optional subjects 150/330	210	120	17C	

* Examination.

** Credit for a course.

*** Optional subjects.

Clinical practices

Epizootiology	60 hours
Veterinary surgery	45 hours
Internal diseases of farm animals	30 hours
Internal diseases of man-accompanying animals	30 hours
Poultry diseases	30 hours
Obstetrics and animals reproduction	60 hours
Parasitology and veterinary invasiology	15 hours
Veterinary radiology	15 hours
Dermatology	30 hours
<hr/>	
Total	315 hours

Altogether didactic hours

General specific and professional subject	4075 hours
Optional subject	180 hours
Clinical practices	315 hours
Professional trainings	560 hours
<hr/>	
Total	5130 hours

Professional trainings

After the 4th year	– clinical practice	– 4 weeks
	– practice slaughter-house	– 2 weeks
After the 5th year	– clinical practice	– 4 weeks
	– sanitary practice	– 2 weeks

**RESEARCH ACTIVITY
OF VETERINARY MEDICINE FACULTY**

(Published in 2011)

INSTITUTE OF BIOLOGICAL RUDIMENTS OF ANIMAL DISEASES

30 Głęboka, Lublin

Head: Prof. ordin. Dr. habil. Andrzej Wernicki

SUB-DEPARTMENT OF FISH DISEASES AND BIOLOGY

Akademicka 12, Lublin

Head: Prof. extraordin. Dr. habil. Antonina Sopińska

RESEARCH STUDIES (SUMMARIES)

Leszek Guz, Antonina Sopińska, Tomasz Oniszczuk

EFFECT OF *Echinacea purpurea* ON GROWTH AND SURVIVAL OF GUPPY (*Poecilia reticulata*) CHALLENGED WITH *Aeromonas bestiarum*.

The effects of *Echinacea purpurea* supplementation on growth performance, nutrient utilization, body composition and disease resistance were studied in the ornamental fish *Poecilia reticulata*. Five diets were used, each differing in Echinacea content (0 g kg⁻¹ diet — control, 5 g kg⁻¹ diet – group 1, 10 g kg⁻¹ diet – group 2, 20 g kg⁻¹ diet – group 3, 30 g kg⁻¹ diet – group 4 and 60 g kg⁻¹ diet – group 5), and the fish were fed twice daily at a rate of 30 g kg⁻¹ body weight per day for 67 days. The gain in the body weight and the condition factor were significantly increased in groups 2–5, whereas specific growth rate and feed conversion ratio were significantly increased in all supplemented groups ($P < 0.05$). Cumulative mortalities after challenge infection with the fish pathogen *Aeromonas bestiarum* were the lowest in the groups supplemented with Echinacea. Log-rank tests showed significant differences between the supplemented groups 1, 2,

3, 4 and 5 and the control group ($P = 0.0074$, $P = 0.0075$, $P = 0.00507$, $P = 0.00001$ and $P = 0.00001$, respectively). The results of this study indicate that Echinacea improves body weight gain and resistance against challenge infection in fish.

Publication: Aquac. Nutr. 17, 695–700, 2011, tab. 6. In English, summary in English.

Anna Turska-Szewczuk, Leszek Guz, Buko Lindner, Hubert Pietras,
Ryszard Russa, Otto Holst

**STRUCTURAL CHARACTERIZATION OF THE O-SPECIFIC POLYSACCHARIDE
FROM THE LIPOPOLYSACCHARIDE OF THE FISH PATHOGEN *Aeromonas bestiarum*
STRAIN P1S**

The O-specific polysaccharide obtained by mild-acid degradation of lipopolysaccharide of *Aeromonas bestiarum* P1S was studied by sugar and methylation analyses along with ^1H and ^{13}C NMR spectroscopy. The sequence of the sugar residues was determined using ^1H , ^1H NOESY and ^1H , ^{13}C HMBC experiments. The O-specific polysaccharide was found to be a high-molecular-mass polysaccharide composed of tetrasaccharide repeating units of the structure $\rightarrow 2$ - β -D-Quip3NAcyl-(1 \rightarrow 2)- β -D-Ribf-(1 \rightarrow 4)- β -D-Galp-(1 \rightarrow 3)- α -D-ucpNAc-(1 \rightarrow). Since small amounts of a terminal Quip3N residue were identified in methylation analysis, it was assumed that the elucidated structure also represented the biological repeating unit of the O-specific polysaccharide.

Publication: Carbohydr. Res. 346, 815–821, 2011, fig. 5, tab. 1. In English, summary in English.

SUB-DEPARTMENT OF PARASITOLOGY AND INVASIVE DISEASES

Akademicka 12, Lublin

Head: Dr. Krzysztof Tomczuk

RESEARCH STUDIES (SUMMARIES)

Klaudiusz Szczepaniak, Krzysztof Tomczuk, Maria Studzińska

CUTANEUS MYXOSPORIDIASIS IN THE AUSTRALIAN GREEN TREE FROG (*Litoria caerulea*)

This case is reported with the intention of highlighting the presentation of cutaneous myxosporidiasis in Australian tree frog (*Litoria caerulea*) caused by genus *Myxobolus*. The morphology and morphometric characteristic of the spores were determined using light microscopy and differential interference contrast microscopy. Spores were pyriform in shape in frontal view and oval in lateral view, and the average size was respectively $11.4 \times 6.0 \times 4.5 \mu\text{m}$ ($12.1\text{--}9.5 \times 6.3\text{--}5.4 \times 5.0\text{--}4.1 \mu\text{m}$). To the best of our knowledge, this is the second case of skin invasion caused by myxosporeans in amphibians.

Publication: Parasitol. Res. 108, 489–492, 2011, fig. 3, tab. 1. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

STUDZIŃSKA M.: Fipronil in the tick prevention of dogs and cats. (Фипронил в профилактике заражения клещами собак и кошек.)

Ref.: XIX Moscow International Veterinary Congress. 16–18 IV 2011. Russian Small Animal Veterinary Association (RSAVA)

Publication: Proceedings of Moscow International Veterinary Congress 2011. In Russian

OTHER PUBLICATIONS

MICHALSKI M.M., TOMCZUK K.: Fasciolosis is still dangerous. (Motylca wciąż niebezpieczna).

Publication: Top Agrar Polska 9, 34–37, 2011. In Polish.

.SZCZEPANIAK K., TOMCZUK K.: Reptilian filarial infections. (Filariozy gadów).

Publication: Życie Wet. 86, 608–611, 2011, fig. 3, tab. 1. In Polish, summary in English.

TOMCZUK K.: *Balantidium coli* – common parasites of pigs and humans. (Szparkosz okrężnicy – *Balantidium coli* – wspólny pasożyt świni i człowieka).

Publication: Gazeta Jastkowska 1, 39–40, 2011. In Polish.

TOMCZUK K.: Fight skin parasites. Beef cattle breeding, maintenance, nutrition, health. Top Agrar Poland, expert guide. (Zwalczaj pasożyty skóry. Bydło mięsne: hodowla, utrzymanie, żywienie, zdrowie. Top Agrar Polska, poradnik eksperta).

Publication: Polskie Wydawnictwo Rolnicze Sp. z o. o., Poznań, 94–98, 2011 In Polish.

TOMCZUK K., MICHALSKI M.: Hypodermosis – still a current problem in the cattle. (Hypodermoza – wciąż aktualny problem w hodowli bydła.)

Publication: Weterynaria w terenie 5, 58–64, 2011. In Polish.

TOMCZUK K.: Unusual pet and the associated risks. Pets accompanying raccoon. (Nietypowe zwierzę domowe i związane z tym zagrożenia. Zwierzęta towarzyszące: szop praczy).

Publication: Gazeta Jastkowska 2, 31–32, 2011. In Polish.

TOMCZUK K.: Zoonoses. Cryptosporidiosis dangerous. (Choroby odzwierzęce. Groźna kryptosporidioza).

Publication: Gazeta Jastkowska 3, 30–31, 2011. In Polish.

TOMCZUK K.: Zoonoses. Fasciolosis – the forgotten issue. (Choroby odzwierzęce. Choroba motylicza – zapomniany problem).

Publication: Gazeta Jastkowska 4, 31–32, 2011. In Polish.

SUB-DEPARTMENT OF POULTRY DISEASES

Akademicka 12, Lublin

Head: vacant

REPORTS TO RESEARCH MEETINGS

DUDZIC A., MAREK A., PYZIK E., STĘPIEŃ- PYŚNIAK D.: Ectoparasites as vectors of avian diseases. (Ektopasożyty jako wektory chorób zakaźnych ptaków).

Ref: Conference of the LX anniversary of the Wrocław University of Environmental and Life Sciences. 1–2 VII 2011

Publication: Proceedings of the Conference “Current problems of poultry pathology with special consideration parasitological problems”. Wrocław, 2011, 30–41. In Polish.

PYZIK E., MAREK A., STĘPIEŃ-PYŚNIAK D., DUDZIC A.: Birds parasitosis with special consideration to diseases presenting with respiratory symptoms. (Parazytozy ptaków ze szczególnym uwzględnieniem schorzeń przebiegających z objawami ze strony układu oddechowego).

Ref: Conference of the LX anniversary of the Wrocław University of Environmental and Life Sciences. 1–2 VII 2011.

Publication: Proceedings of the Conference “Current problems of poultry pathology with special consideration parasitological problems”. Wrocław, 2011, 16–29. In Polish.

OTHER PUBLICATIONS

DUDZIC A.: Fowl pox. (Ospa ptaków).

Publication: Polskie Drobiarstwo 1, 34–36, 2011. In Polish.

DUDZIC A.: Avian rimerellosis. (Rimereloza ptaków).

Publication: Życie Wet. 86, 443–445, 2011. In Polish, summary in English.

MAREK A. The poxvirus infections in commercial poultry, pigeons and pet birds. (Zakażenia wirusem ospy u drobiu, gołębi i ptaków ozdobnych).

Publication: Magazyn Wet.. supl., 406–410, 2011. In Polish, summary in English.

SUB-DEPARTMENT OF VETERINARY MICROBIOLOGY

Akademicka 12, Lublin

Head: Prof. extraordin. Dr. habil. Grażyna Ziółkowska
Dr. habil. Barbara Majer-Dziedzic

RESEARCH STUDIES (SUMMARIES)

Irena Choma, Edyta Grzelak, Wioletta Bąk, Karol Pilorz,
Barbara Majer-Dziedzic

DETERMINATION OF ENROFLOXACIN AND CIPROFLOXACIN IN MILK BY DIRECT BIOAUTOGRAPHY DETECTION

Fluoroquinolones are widely used in the treatment of both human and veterinary diseases. Ciprofloxacin, one of the most popular human antibiotics, is a main metabolite of enrofloxacin. In veterinary medicine it is mainly used to cure mastitis and cows. Hence, both of these drugs are potential residues in the milk of treated cows. Analytical methods should be sensitive and selective enough to distinguish between these antibiotics at their maximum residue level (MRL), which is 100 µg/kg for the sum of these drugs. HPLC, most frequently used in antibiotic analysis, can often be replaced advantageously by HPTLC/TLC-DB enables the separation of antibiotics, and at the same time, detection of their antibacterial properties. The developer plate is dipped directly in bacterial suspension. After incubation and visualization, an inhibition of bacterial growth around the antibiotic zones can be observed. The method is simple, very sensitive, accurate and precise. Its great advantage over HPLC is not only the analysis of many samples at the same time but also the additional information about their antibacterial properties. The detection of any further antibacterial compounds, which are not known (e.g. breakdown products) or not in the focus of the regular target analysis, is treasured as well.

Publication: Planar Chromatography in Practice. 106, 2–4, 2011, fig. 2. In English, summary in English.

Edyta Grzelak, Barbara Majer-Dziedzic, Irena Choma

**DEVELOPMENT OF A NOVEL DIRECT BIOAUTOGRAPHY-THIN-LAYER
CHROMATOGRAPHY TEST: OPTIMIZATION OF GROWTH CONDITIONS
FOR GRAM-NEGATIVE BACTERIA *Escherichia coli***

With the aim of developing a TLC-direct bioautography assay using *Escherichia coli* as test bacteria, various parameters influencing the viability of microorganisms on TLC plates were examined and checked for flumequine standards. The optimal times for preincubation and incubation of bacterial broth were 20 h at 37 degrees C and 2 h at 37 degrees C, respectively. The optimal viscosity of the broth was obtained for 0.05% agarose solution in Mueller-Hinton broth. Various incubation times of the seeded TLC plates were also tested (5 h proved to be optimal). After incubation, the plates were sprayed with 0.2% aqueous [3-(4,5-dimethyldiazol-2-yl)-2,5 diphenyltetrazolium bromide] (MTT) solution and incubated for 0.5 h at 37 degrees C. The precision of the method was evaluated by the repeatability (intraday assay) and intermediate precision (interday assay). The regression coefficients were 0.9977 and 0.9968, respectively, for intraday and interday curves. The calibration curves show good linearity in the range of 0.005–0.50 microg (0.5–50.0 microg/mL). The established LOD of flumequine equaled 0.5 microg/mL, i.e., 5 ng flumequine in the spot. The developed direct bioautography test significantly enhances the sensitivity of the TLC method.

Publication: J. AOAC Int. 94(5),1567–1572. In English, summary in English.

Wioletta Bąk, Irena Choma, Barbara Majer-Dziedzic

**MATRIX SOLID-PHASE DISPERSION COMBINED WITH THIN-LAYER
CHROMATOGRAPHY-DIRECT BIOAUTOGRAPHY FOR DETERMINATION
OF FLUMEQUINE RESIDUES IN MILK: IMPROVEMENT OF THE METHOD**

Flumequine is a fluoroquinolone antibiotic, mainly used in veterinary and, to some extent, in human treatment. It can be found as a residue in milk and in other food products. A new version of matrix solid-phase dispersion of milk samples spiked with this antibiotic was developed. This preseparation method was combined with thin-layer chromatography-direct bioautography to obtain semi-quantitative results. *Escherichia coli* were used as test bacteria. The various modes of the procedure were tested, and the one giving the best recovery of the antibiotics from milk was chosen.

Publication: J. Liquid Chromatograph. Related Technol. 34, 1–8, 2011, fig. 4, tab. 2. In English, summary in English.

Barbara Majer-Dziedzic, Andrzej Jakubczak, Jerzy Ziętek

**PHYLOGENETIC ANALYSIS OF POLISH STRAINS
OF CANINE *Parvovirus* CPV-2 AND ITS VARIANTS**

Canine parvovirus disease appeared in the world and in Europe during the second half of the 1970s. Over the course of 40 years the original CP-2 strains mutated and variants 2a, 2b and 2c appeared. Their appearance is connected with specific amino acid changes, mainly in the capsid protein VP2. Strains isolated by the authors were adapted for in vitro cell culture. Phylogenetic analysis revealed differences between strains isolated in Poland in 1982–1985 and in 1995–2009. Strains from the 1980s were shown to belong to variant CPV-2a (11 strains) and variant 2b (2 strains), while no fundamental differences were found among the genetic profiles of the strains from 1995–2009, which were classified as belonging to variant 2c.

Publication: Pol. J. Vet. Sci. 14.3, 379–384, 2011, fig. 2. In English, summary in English

SUB-DEPARTMENT OF VETERINARY PROPHYLAXIS

Akademicka 12, Lublin

Head: Prof. ordin. Dr. habil. Andrzej Wernicki
Dr habil Renata Urban-Chmiel

RESEARCH STUDIES (SUMMARIES)

Marta Dec, Andrzej Wernicki, Andrzej Puchalski, Renata Urban-Chmiel

CONGLUTININ IS NOT SPECIFIC TO CATTLE

Conglutinin is a high-molecular-weight mammalian lectin which binds in a calcium-dependent manner to cell-surface-bound complement fragment iC3b, yeast cell-wall extract and terminal non-reducing N-acetyl-d-glucosamine, mannose and fucose residues. This protein, originally detected in bovine serum, belongs to the family of collectins, which are effector molecules in innate immunity. Conglutinin appears to play an important role in defence mechanisms, showing antiviral and antibacterial activity. We have characterized the electrophoresis profile of bovine serum conglutinin and used Western blotting to compare profiles of this lectin derived from the sera of different breeds of cattle. The profile of non-reduced conglutinin is characterized by many bands with molecular masses ranging from 34 to 630 kDa. Reduced lectin takes the form of three main bands with molecular masses of 41, 47 and 96 kDa. We show that conglutinin is present not only in adult bovine serum, but also in foetal bovine serum, colostrum and milk. The sera of sheep, goats, gnu antelopes and deer, as well as some non-ruminant species such as llamas, horses, boars, pigs and humans, contain proteins which have similar antigenicity to that of bovine conglutinin. These reacted with monoclonal and polyclonal antibodies specific for bovine conglutinin under reducing and non-reducing conditions in Western blotting. The protein profiles of bison and swine lectin were observed to be particularly similar to bovine conglutinin.

Publication: Vet. Medicina, (Praque) 56, 510–519, 2011, fig. 6. In English, summary in English.

Renata Urban-Chmiel, Piotr Hola, Urszula Lisiecka, Andrzej Wernicki,
Andrzej Puchalski, Marta Dec, Marta Wysocka

**AN EVALUATION OF THE EFFECTS OF A-TOCOPHEROL AND ASCORBIC ACID
IN BOVINE RESPIRATORY DISEASE COMPLEX OCCURRING IN FEEDLOT CALVES
AFTER TRANSPORT**

Taking into account the beneficial effects of antioxidants in reducing morbidity and mortality in calves, the aim of this study was to evaluate the effects of vitamins E and C on the development of the inflammation process and on selected defence mechanisms against infections induced by *M. haemolytica*. The study was carried out on 30 Simmentaler calves weighing about 100 kg, which received s.c. vitamin E (750 UI) or vitamin C (2.5 g/calf). In leukocytes obtained from the calves, sensitivity to the cytotoxic effect of *M. haemolytica* Lkt was evaluated using the MTT assay, expression of β 2-integrin receptors on leukocyte surfaces was assessed, and metabolic activity was measured by the nitrotriazolium blue test (NBT). Concentration of haptoglobin (Hp) and serum amyloid A (SAA) was estimated in the sera obtained. Analysis of the intracellular metabolism of the leukocytes showed no statistically significant differences compared to the control. A difference ($p \leq 0.05$) was observed in the sensitivity of the leukocytes to the cytotoxic effect of Lkt in comparison with the control group. No differences were found in the percentage of cells sensitive to Lkt between the group given vitamin E and the calves which received vitamin C. The percentage of expression of β 2-integrin receptors reached its lowest values on leukocytes isolated from the calves given vitamin E. The correlation between expression of β 2-integrins and sensitivity of leukocytes to Lkt showed the greatest correlation on day 14 in calves given vitamin E, and on day 21 in calves given vitamin C.

Analysis of Hp concentration in the sera showed no differences between the two groups of calves tested, but revealed differences ($p \leq 0.05$) in absorbance values compared to the control on particular days of experiment. SAA concentration in the sera of calves from the group that received vitamin E was similar to that of the control on days 14 and 21 of the experiment. On days 3 and 7 of the experiment a significant ($p \leq 0.05$) decrease was observed in SAA in the sera obtained from calves from the group given vitamin E compared to the control and the group given vitamin C.

Publication: Livestock Sci. 141, 53–58, 2011, tab. 4. In English, summary in English.

Renata Urban-Chmiel, Urszula Lisiecka, Agnieszka Chłopa, Łukasz Kurek,
Andrzej Wernicki

**THE INFLUENCE OF SELECTED TECHNIQUES OF BOVINE LEUKOCYTE
ISOLATION ON THEIR VIABILITY AND METABOLISM**

The aim of the study was to assess the effect of selected isolation methods on the viability and metabolism of bovine leukocytes. The cells were isolated using a Ficoll 1077, Histopaque 1083 gradient and osmotic shock method, and Ficoll or Histopaque with osmotic shock. Evaluation were made of the total number of cells, viability after isolation and in 24h culture on RPMI 1640 medium and metabolism with NBT reduction assay. Microscopic and cytometric evaluation of the leukocytes revealed that the isolation methods applied had an influence on their number and viability. Based on the results it can be concluded that isolation methods of cells in a Histopaque or Ficoll yield highly pure cell fractions with high viability.

Publication: Pol. J. Vet. Sci. 14, 663–665, 2011, tab.2. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

DEC M., WERNICKI A., PUCHALSKI A., URBAN-CHMIEL R.: Is conglutinin specific only for cattle?

Ref.: XIV Conference Polish Experimental and Clinical Immunology Society, Gdańsk, 16–18 VI 2011.

Publication: Proceedings of the XIV Conference Polish Experimental and Clinical Immunology Society, 44, 2011, In English.

DEC M., WERNICKI A., PUCHALSKI A., URBAN-CHMIEL R., RADEJ S.: The effect of conglutinin on phagocytic activity of bovine leukocytes.

Ref.: XIV Conference Polish Experimental and Clinical Immunology Society, Gdańsk, 16–18 VI 2011.

Publication: Proceedings of the XIV Conference Polish Experimental and Clinical Immunology Society, 31, 2011, In English.

STACHURA R., URBAN-CHMIEL R., HOLA P., WERNICKI A., DEC.M., FRAJNT M.: The influence of vitamin C and E, flunixin and florfenicol on chosen immunological mechanisms of bovine leukocytes against *M. haemolytica* leukotoxin.

Ref.: XIV Conference Polish Experimental and Clinical Immunology Society, Gdańsk, 16–18 VI 2011.

Publication: Proceedings of the XIV Conference Polish Experimental and Clinical Immunology Society, 46, 2011, In English.

URBAN-CHMIEL R, WERNICKI A., KANKOFER M., PUCHALSKI A., DEC M., CHRZANIUK K., WYSOCKA M.: Characterization of oxidative stress parameters and immunoglobulin level in calves during feedlot.

Ref.: XVIII Scientific Conference Animal Protection and Welfare, Brno, Czechy, 20–21 IX 2011.

Publication: Proceedings of the XVIII Scientific Conference Animal Protection and Welfare, 170, 2011. In English.

DEPARTMENT OF ANATOMY AND ANIMAL HISTOLOGY

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SUB-DEPARTMENT OF ANIMAL ANATOMY

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Prof. Dr. habil. Marcin Arciszewski
Dr. habil. Izabela Krakowska

RESEARCH STUDIES (SUMMARIES)

Małgorzata Matysek, Radosław Szalak, Jadwiga Jaworska-Adamu

STRUCTURE AND TOPOGRAPHY OF THE CHINCHILLA LANIGERA'S CLAUSTRUM

Structure and topography of claustrum have been earlier described in Primates and in other mammals. Similar examinations have not been carried out on brains of *Chinchilla lanigera* so far. The aim of this paper was to study structure and topography of claustrum, analyse its shape, compare it with a shape of other animals especially rodents. Neurons forming this structure were analysed, morphometric analyses of a number of nervous cells in pars dorsalis and pars ventralis were made. Histological slides were stained with cresyl violet according to Klüver and Barrera's method. Chinchilla's claustrum resembles a shape of a sand glass, made up of pars dorsalis and pars ventralis. In pars dorsalis numerous oval and round, large and medium size neurons arranged in clusters were observed. Pars ventralis was characterized by less numerous round, small and medium cells scattered irregularly. The carried out morphometric analyses correlate

with quantity analyses. Structure and topography of Chinchilla Langer's claustrum is similar to this nucleus. form especially in rabbit.

Publication : Medycyna Wet. (Lublin) 67, 835–837, 2011, fig. 6. In English, summary in English.

Radosław Szalak, Jadwiga Jaworska-Adamu

INTRACELLULAR EXPRESSION OF SELECTED CALCIUM-BINDING PROTEINS IN THE NEURONS OF A CHINCHILLA'S HIPPOCAMPUS

Wewnątrzkomórkowa ekspresja białek wiążących wapń w hipokampie u szynszyli

The main aim of the study was to investigate the intracellular localization of the following calcium-binding protein: parvalbumin, calbindin and calretinin. 15 sexually mature chinchilla males (about 1.5 years old) were used in the examination. The hippocampus was collected from each immediately after the slaughter, fixed and properly prepared for immunohistochemical examinations. Peroxidase-anti-peroxidase (PAP) reaction carried out using specific antibodies against parvalbumin and calbindin D28k, as well as calretinin. Our own examination results have shown cytoplasmic as well as nuclear reactions in the examined regions of the hippocampal areas (CA1–CA4) and dentate gyrus. Only in the CA2 area was no nuclear reaction observed for the examined proteins, as well as in the CA1 area for calretinin. Intracellular localization of calcium-binding proteins proves that regulatory functions of parvalbumin, calbindin and calretinin lead to neuronal plasticity, i.e. to a change of their activity. Therefore, calcium-binding proteins may be indirectly involved in the regulation of metabolic processes affecting basic vital functions of neurons.

Publication: Medycyna Wet.(Lublin) 67, 695–669, 2011, fig. 8, tab. 1. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

SZALAK R., KRAWCZYK A., JAWORSKA-ADAMU J., WAWRZYŃIAK-GACEK A., KRAWCZYK I.: Parvalbumin immunoreactivity in the frontal cortex of the chinchilla Langer. (Immunoreaktywność parwalbuminy w korze czołowej szynszyli małej). Ref. XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, Lublin, 12–14 IX 2011.

Publication: Proceedings of the XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, 83, 2011. In Polish.

SZALAK R., KRAWCZYK A., JAWORSKA-ADAMU J., WAWRZYNIAK-GACEK A.: Intracellular expression of selected calcium-binding proteins in the neurons of a chinchilla's hippocampus. (Wewnątrzkomórkowa ekspresja białek wiążących wapń w hipokampie u szynszyli).

Ref. XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, Lublin, 12–14 IX 2011.

Publication: Proceedings of the XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, 84, 2011. In Polish.

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RESEARCH STUDIES (SUMMARIES)

Anna Boguszevska-Czubara, Anna Hordyjewska, Irena Musik,
Kazimierz Pasternak, Jadwiga Jaworska-Adamu, Radosław Szalak

THE INFLUENCE OF ORAL ADMINISTRATION OF SILICON ON CHROMIUM CONCENTRATIONS IN BLOOD AND CHOSEN TISSUES OF RATS

Silicon is an essential nutrient. It has been found to take part in many life processes of animals related to tissue regeneration and maintaining healthy connective tissue and bones. It causes anticancerous, antiatherosclerotic and antidiabetic actions and beneficial effects on several human disorders, as for example osteoporosis, ageing of skin, hair and nails, arteriosclerosis, wound healing and immune functions. Trivalent chromium compounds are recognized as essential for proper tissue functions in human. It actively participates in carbohydrate and lipid metabolism and this is the reason why it is popular as a supplement in diet for patients with diabetes and with parallel disturbance of lipid metabolism. It has ability to increase muscle mass and reduce body fat in obese individuals. Chromium may also inhibit key enzymes in the synthesis of cholesterol, thus improving the lipid profile of individuals with dyslipidaemia. Results of our studies confirmed influence of orally administered silicon on concentrations of chromium in liver and blood of experimental animals, while no interactions between administered silicon and chromium concentrations in brain and kidneys were found. Metabolism of silicon in human beings remains unknown and that is the reason for further studies concerning its utilization and its interactions with other elements and nutrients are needed.

Publication: Annales UMCS, (Lublin) sectio DDD, Pharmacia, 24, 33–39, 2011, tab. 1. In English, summary in English and Polish.

Anna Boguszewska-Czubara, Anna Hordyjewska, Kazimierz Parsternak,
Małgorzata Kielczykowska, Jadwiga Jaworska-Adamu, Radosław Szalak

**THE LEVEL OF CALCIUM AND MAGNESIUM IN BLOOD OF RATS
RECEIVING VARIOUS DOSES OF SILICON**

Silicon, the third most abundant trace element of the human body, is listed as an essential one. It is especially associated with connective tissues as it has been found to take part in bone development, collagen formation and mineralization of bone matrix. Silicon is also implicated in mammalian hormonal control and in protecting against heart disease in humans. The influence of different doses of orally-administered silicon on calcium and magnesium concentrations in the blood of experimental animals was evaluated.

The experiment was carried out on male Wistar rats. A control group was given distilled water to drink. The rats in group 0 were given a solution of sodium hydroxide (0.001 mol/L), whereas animals in groups 1, 2 and 3 received solutions of orthosilicic acid of three different concentrations (0.05%, 0.5% and 1%) as the only drinking fluids. Blood was collected after 4 and then 8 weeks of the experiment. Determination of calcium and magnesium concentrations in the blood was performed by the ICP-AES method.

Silicon administration caused an increase in blood calcium concentration after 4 as well as after 8 weeks of the experiment. Four-week-long silicon intoxication caused a decrease in blood magnesium concentrations, whereas an increase in blood magnesium level in groups 0, 1 and 3 and a decrease in group 2 after 8 weeks of the experiment were noted.

Silicon was found to significantly influence metabolism of calcium and magnesium. Its interaction with calcium during the process of bones mineralization suggests that Si supplementation may be helpful in preventing osteoporosis in postmenopausal women whose calcium intake is insufficient. Homeostasis in mineral metabolism and balance between elements are very important matters, therefore silicon metabolism and its interactions with other elements and nutrients should be further investigated.

Publication: Adv. Clin. Exp. Med. 20, 677–682, 2011, fig. 2. In English, summary in English and Polish.

Jadwiga Jaworska-Adamu , Mirosława Dmowska, Regina Cybulska,
Aleksandra Krawczyk, Bożena Pawlikowska-Pawłęga

**INVESTIGATIONS OF HIPPOCAMPAL ASTROCYTES IN LIPOPOLYSACCHARIDE
PRECONDITIONED RATS IN THE PILOCARPINE MODEL OF EPILEPSY**

The present paper is the first work to determine the effect of lipopolysaccharide (LPS) in the pilocarpine model of epilepsy on the morphology of rat hippocampal astrocytes *in vivo*. The study involved adult male Wistar rats, which 72 hours prior to administration of pilocarpine hydrochloride (PILO) were intraperitoneally (ip) preconditioned with LPS at a dose of 0.5 mg/kg b.w. The control animals were administered (ip) saline or LPS alone. The astrocytes in the control animals displayed characteristic stellate morphology. Examinations of the astrocytes were performed on days one, three and 21 of the pilocarpine model of epilepsy (i.e. in the acute, silent and chronic periods).

The astrocytes of the CA1 and CA3 pyramidal layers of the hippocampus were observed and analyzed at the structural and ultrastructural levels. It was demonstrated that on days one and three, glial cells from both the nonpreconditioned and the LPS-preconditioned animals displayed similar reactive changes, manifesting themselves as swelling of cell bodies, glial processes, and astrogliosis. Moreover, reduction in cell organelles aggregated at one pole and the presence of vacuoles were observed. The most pronounced astrogliosis and cell swelling occurred on day 21. We conclude that LPS has no effect on the morphology of astrocytes in the pilocarpine model of epilepsy, unlike the results obtained by other authors *in vitro*.

Publication: Folia Histochem. Cytobiol. 49, 1–6, 2011, fig. 3. In English, summary in English.

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Ref. XIV Magnesiological Scientific Conference in Lublin, 28 V 2011.

Publication: Proceedings of the XIV Magnesiological Scientific Conference in Lublin, 23, 2011. In Polish.

JAWORSKA-ADAMU J., KRAWCZYK A., SZALAK R., WAWRZY尼亚K- GACEK A.: Calretinin expression in the frontal cortex neurons of the chinchilla lanigera. (Ekspresja kalretyny w neuronach kory czołowej szynszyli małej).

Ref. XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, Lublin, 12–14 IX 2011.

Publication: Proceedings of the XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, 26, 2011. In Polish.

WAWRZY尼亚K-GACEK A., JAWORSKA-ADAMU J., KRAWCZYK A., SZALAK R.: Astrocytes in midbrain periaqueductal gray matter in old rats. (Astrocyty istoty szarej śródkowej śródmózgowia u starych szczurów).

Ref. XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, Lublin, 12–14 IX 2011.

Publication: Proceedings of the XLIV Symposium of the Polish Society for Histochemistry and Cytochemistry, 95, 2011. In Polish.

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Publication: Medycyna Wet. (Lublin) 67, 390–393, 2011. In Polish, summary in English.

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Dr. habil. Jose Luis Valverde Piedra
Dr. habil. Marcin Tatara

RESEARCH STUDIES (SUMMARIES)

Adrian Harrison, Marta Pawłowska, Else Marie Bartels,
Jose Luis Valverde Piedra, Henryk Skrzypek, Stefan Pierzynowski

THE EFFECTS OF ORAL ADMINISTRATION OF ALPHA KETOGLUTARATE ON STOMACH-BYPASS INDUCED ARTERIAL STIFFNESS IN RATS

Obesity is an increasing problem, for which stomach-bypass is a popular option, although this procedure is not without physiological consequences. Non-obese Roux-en-Y operated rats *cf* sham-operated rats either fed a normal diet or one supplemented with alpha ketoglutarate were investigated. Male Sprague Dawley rats (n = 48) were randomly assigned to one of four treatment groups; bypass-operated without AKG supplement (B-AKG), bypass-operated with AKG (B+AKG), sham-operated without AKG (S-AKG), and sham-operated with AKG (S+AKG). Rats were killed 8 weeks after surgery, and the aorta, prior to the right and left common iliac arteries, was removed, cut into 6–9 mm pieces and exposed to a series of step-wise increases in tension. The subsequent degree

to which aorta sections resisted an increase in tension was measured, being defined as “elastic recoil”, and expressed in $\text{N ms}^{-1} \text{mg}^{-1}$ wet wt. Samples were also taken for both light and scanning electron microscopy analysis.

Bypass surgery induced a reduction in body weight (6.5%) comparable in size to that typically recorded two months after surgery in human subjects. Moreover, the operation induced a 40% decrease in arterial elasticity *cf.* sham-operated controls ($P = 0.007$), with alphaketoglutarate having a partial restorative effect, returning elasticity to 60% of that of controls ($P < 0.05$). Likewise, the operation induced approximately a 20% loss of arterial wall thickness ($P < 0.05$), and a commensurate reduction in elastin and collagen fibre thickness (both $P < 0.05$), changes that were reversed with alpha ketoglutarate.

Clearly, stomach-bypass surgery, whilst successful in terms of weight loss, is not without serious adverse effects on artery elasticity. This issue must be addressed when considering the suitability of individuals for this type of surgery, and perhaps both preintervention and continued dietary alpha ketoglutarate supplementation should be recommended.

Publication: BJCCSB 1, 24–34, 2011, fig. 2, tab. 3. In English, summary in English.

Sylwester Kowalik, Witold Kędzierski

THE EFFECT OF INTERVAL VERSUS CONTINUOUS EXERCISE ON PLASMA LEPTIN AND GHRELIN CONCENTRATION IN YOUNG TROTTERS

The effect of interval vs. continuous exercise on plasma leptin and ghrelin concentration in young Standardbred horses was studied. The experiment was conducted on 27 trotters, in the age between 2 and 3 years. They were divided into two groups according to the type of exercise. Blood samples were collected through jugular venipuncture in the following experimental conditions: at rest, immediately after exercise and 30 minutes after the end of the effort. Plasma leptin and ghrelin concentrations were determined using RIA tests.

The continuous exercise induced an increase in plasma leptin concentration whereas the interval type of exercise did not influence the level of this hormone (3.47 ± 0.78 vs. 4.07 ± 0.94 and 2.31 ± 0.15 vs. 2.36 ± 0.21 ng/mL, respectively). The plasma ghrelin concentration measured after the continuous exercise, significantly increased (720 ± 27.4 vs. 814 ± 13.8 ; $p \leq 0.05$) whereas concentration of this hormone assessed after the interval exercise, significantly dropped (982 ± 56.5 vs. 842 ± 35.6 pg/mL; $p \leq 0.05$). The changes in plasma ghrelin concentration measured after the end of the effort correlated inversely with blood lactic acid concentration. In conclusion, the obtained results showed that medium-

intensive type of exercise, such as trot, interval or continuous, slightly affected plasma leptin level but significantly affected plasma ghrelin concentration in young Standardbred trotters.

Publication: Pol. J. Vet. Sci. 14, 373–378, 2011, tab. 2. In English, summary in English.

Sylwester Kowalik, Agata Wawrzyniak-Gacek, Tomasz Piersiak,
Stefan Grzegorz Pierzynowski

**RELATION BETWEEN GROWTH AND BONE COLLAGEN CONTENT IN YOUNG PIGS;
EFFECTS OF DIETARY ALFA-KETOGLUTARATE SUPPLEMENTATION**

The aim of this study was to determine the effect of dietary supplementation with α -ketoglutarate (AKG) sodium salt on growth rate in relation to bone collagen formation during the first 70 d of postnatal life in piglets. The results show that dietary AKG supplementation increased body weight of the experimental piglets in comparison to the controls, especially between 21st and 56th d of life ($P \leq 0.01$). Moreover, the area of collagen trabeculae slightly increased in experimental age sub-groups and reached the highest differences between 14th ($P \leq 0.01$) and 70th d of piglets life ($P \leq 0.001$).

In contrast, the highest values for the number of collagen trabeculae were observed in piglets at 3rd d of age, regardless of treatment group. The positive effect of AKG supplementation on the number of collagen trabeculae was found between 3rd and 35th d of life, with statistical confirmation at days 14, 35, and 56 ($P \leq 0.01$). The data-lines of the bone strain showed similar course during the whole experimental period, except 56th d of life, when the experimental piglets reached statistically significant, higher values in comparison to the controls ($P \leq 0.05$). Similarly, the blood plasma osteocalcin reached the highest concentration in experimental sub-groups from 21st d of life in comparison to the controls, with statistical significance at the age of 56 ($P \leq 0.05$). These data indicate that dietary AKG supplementation effectively stimulated collagen synthesis in young growing piglets, both before and after weaning.

Publication: Bull. Vet. Inst. Pulawy 55, 287–292, 2011, fig. 2. In English, summary in English.

Witold Krupski, Marcin R. Tatara

**DEGENERATIVE CHANGES OF VERTEBRAE, INTERVERTEBRAL DISCS,
AND NARROWING OF THE INTERVERTEBRAL FORAMENS
OF THE CERVICAL SPINE IN PHYSICAL WORKERS WITH NECK PAIN**

Disorders of the skeletal system in humans are a serious problem. The aim of the study was to determine occurrence of degenerative changes of vertebrae, degeneration of intervertebral discs, osteophytes of vertebral body margins, and narrowing of intervertebral foramens on several motion segments of cervical spine in physical workers suffering from neck pain (NP). All patients were subjected to computed tomography examination and following three-dimensional shaded surface display reconstructions of the C3–C7 segments. The relationships between intervertebral discs degenerative changes, osteophytes of vertebral body margins, and intervertebral foramens narrowing of cervical spine were determined. The occurrence of degeneration of intervertebral discs and osteophytes of vertebral body margins was stated in 97 and 56 motion segments of the cervical spine, respectively. The occurrence of narrowing of intervertebral foramens on the right and left side of the cervical spine was stated in 84 and 78 motion segments, respectively. Statistically significant relationships were found between the investigated degenerative changes within single motion segment. In conclusion, positive relationships were found between the occurrence of degeneration of intervertebral discs, osteophytes of anterior vertebral body margins, and narrowing of intervertebral foramens of the cervical spine in physical workers suffering from NP.

Publication: JPCCR (Lublin), 5, 60–62, 2011, fig. 3. In English, summary in English.

Iwona Puzio, Jose Luis Valverde Piedra, Małgorzata Kapica, Marek Bienko

**INFLUENCE OF INTRAGASTRIC ADMINISTRATION OF GHRELIN RECEPTOR
ANTAGONIST [D-LYS3]-GHRP-6 ON BONE TISSUE IN RATS**

The aim of the study was to investigate the influence of [D-Lys3]-growth hormone releasing peptide-6 (GHRP-6), an antagonist of GHS-R1a, on the growth performance and properties of bone tissue in rats. The studies were performed on 12 male Wistar rats, divided into two equal groups. Control rats received 0.5 ml of physiological saline, while experimental rats received intragastrically 100 nmol/kg b.w. of [D-Lys3]-GHRP-6 once a day, throughout 4 weeks. After that time, the animals were subjected to euthanasia. tBMC, tBMD, lean mass (LM), and fat mass (FM) contents were measured using DEXA methods.

Plasma level of total ghrelin was also measured. The quality of the femur and tibia was estimated based on their weight, length, BMC, and BMD. [D-Lys3]-GHRP-6 decreased final body weight, LM content, and tBMD, and significantly reduced bone weight and BMC as compared to the control group. No significant differences were noted in bone length and BMD. Plasma level of total ghrelin was significantly higher after the treatment. We concluded that the intragastric treatment with [D-Lys3]-GHRP-6 negatively influenced the growth performance and properties of bone in rats. Therefore, ghrelin probably achieves effect in bone by acting on its specific receptor GHS-R1a.

Publication: Bull. Vet. Inst. Pulawy 55, 501–505, 2011, tab. 2. In English, summary in English.

Marcin R. Tatar, Witold Krupski, Barbara Tymczyna, Piotr Majcher,
Paweł Rosenbeiger, Dorota Niedziela

**INTERRELATIONSHIPS BETWEEN DENSITOMETRIC, MORPHOMETRIC,
AND MECHANICAL PROPERTIES OF THE FEMUR IN MALE POLISH MERINO SHEEP**

The aim of the study was to determine the interrelationships between densitometric, morphometric, and mechanical properties of the femur in 5 month old Polish Merino sheep. The study was performed on 24 healthy male lambs at the age of 5 months. All right femora were weighed and their length was measured.

Using QCT technique, the determination of volumetric bone mineral density (vBMD) of the trabecular and cortical bone compartments was performed. Total bone volume and mean volumetric bone mineral density of whole femur were also determined. Geometrical properties such as cross-sectional area, second moment of inertia, mean relative wall thickness, and cortical index were calculated on the basis of computed tomography measurements. Mechanical properties of the femur in terms of maximum elastic strength (W_y) and ultimate strength (W_f) were determined using a three-point bending test.

Furthermore, Pearson's correlation coefficient was determined for all the investigated variables of the femur. Obtained results have shown significant correlations between morphometric, densitometric, and mechanical parameters of the femur. Statistically significant correlations between vBMD of cortical bone and W_y ($r = 0.61$) and W_f ($r = 0.57$) indicate the highest value of this densitometric parameter for mechanical strength prediction of bones in vivo.

Thus, computed tomography technique may serve in sheep as non-invasive and precise tool for in vivo monitoring of metabolic responses of skeleton, in terms of morphological and densitometric properties, to physiological, meta-

bolic, nutritional, pharmacological, and toxicological factors influencing bone tissue metabolism.

Publication: Bull. Vet. Inst. Pulawy 55, 795–799, 2011, tab. 1. In English, summary in English.

Marcin R. Tatara, Witold Krupski, Michał Jankowski, Zenon Zduńczyk,
Jan Jankowski, Tadeusz Studziński

EFFECTS OF DIETARY CALCIUM CONTENT AND VITAMIN D SOURCE ON SKELETAL PROPERTIES IN GROWING TURKEYS

The aim of the study was to investigate the effects of feeding fast growing turkeys with differentiated dietary calcium (Ca) content, and the partial replacement of vitamin D₃ in the feed with 25-hydroxycholecalciferol (25(OH)D₃), on skeletal properties. One-day-old Big-6 male turkeys (n = 1008) were randomly divided into 4 groups, and two subgroups were created within each group. The groups were differentiated with 4 levels of Ca provision in the feed, namely 85% of the National Research Council (NRC) recommendation (Group Ca₁); 95% as above (Group Ca₂); 105% as above (Group Ca₃); and 115% as above (Group Ca₄). The first subgroup received the recommended dosage of cholecalciferol (vitamin D₃ subgroup) in the feed, while in the second subgroup (Hy-D subgroup), half of the dosage of cholecalciferol was replaced with 25(OH)D₃. At the ages of 4, 8, 12 and 20 weeks, 7 turkeys from each subgroup were randomly selected and killed to obtain the right tibia for densitometric, geometric and mechanical analyses. This study showed advantageous effects of increased calcium supply in the diet on skeletal system properties, that were increased and produced the most desirable traits in turkeys receiving 95, 105 and 115% of the NRC calcium recommendation.

Benefits resulting from administration of 25(OH)D₃ in the diet were also obtained in the skeletal formation of turkeys, and the most advantageous effects were present in the group receiving 105% of recommended dietary Ca. Effects on the metabolic response of the skeleton of turkeys to manipulation of dietary calcium content and vitamin D₃ source were the most evident in the groups between 4 and 12 weeks of life, and demonstrated a limited ability to induce a positive influence on bone properties at advanced stages of the production cycle by alteration of these dietary factors.

Publication: Br. Poult. Sci. (Edinburgh), 52, 718–729, 2011, tab. 7. In English, summary in English.

Ewa Tomaszewska, Piotr Dobrowolski

PRENATAL GLUCOCORTICOIDS CAN PROGRAM POSTNATAL DEVELOPMENT

Endogenous steroid hormones play a fundamental role in the prenatal development of important vital systems, but when their concentration is long-time enhanced they have a negative impact on the postnatal physiological processes. Prenatal programming is widely used in the context of the permanent alteration of foetal physiological processes. These are caused by factors acting during a critical period of development called the window of the development. Different factors may programme foetal maturity and enhance survival ability after the birth, and may result in disadvantageous consequences in postnatal life. Many studies have shown a relationship between alterations induced by the impact of the mother during pregnancy on the embryo or foetal development, and many consequences which are observed in their offspring. Synthetic GCs given to pregnant females (experimentally or therapeutically), and the increase of endogenous GCs caused by different stressors, lead to identical changes in the process of foetus development.

This review focuses on the impact of the prenatal overload with synthetic glucocorticoids on the postnatal development of both humans and experimental animals. It is not known whether these alterations are transient or permanent after the birth, or if they persist, and the extent to which they may be reversed therapeutically.

Publication: JPCCR (Lublin) 5, 21–26, 2011. In English, summary in English.

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Publication: J. Physiol. Pharmacol., 62, suppl. (1), 102, 2011. In English.

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Publication: J. Physiol. Pharmacol., 62, suppl. (1), 188, 2011. In English.

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Publication: Book of abstracts of the XVIII International Conference KRMIVA, 70, 2011. In English.

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Publication: J. Physiol. Pharmacol., 62, suppl. (1), 109, 2011. In English.
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Publication: Bone (San Diego), 48, 171–172, 2011. In English.
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SUB-DEPARTMENT OF BIOCHEMISTRY

Akademicka 12, Lublin

Head: Prof. extraordin. Dr. habil. Marta Kankofer

RESEARCH STUDIES (SUMMARIES)

Edyta Albera, Marta Kankofer

THE COMPARISON OF ANTIOXIDATIVE/OXIDATIVE PROFILE IN BLOOD, COLOSTRUM AND MILK OF EARLY POST-PARTUM COWS AND THEIR NEWBORNS

Act of delivery is supposed to be connected with antioxidative/oxidative imbalance not only in female but also in her newborn. The aim of the study was to compare antioxidative/oxidative profile of cows and their newborns in blood, colostrum and milk during early post-partum period. Twenty five healthy pregnant cows and their newborns were included into study. Blood and colostrum/milk samples were obtained immediately after parturition, 24, 48 h as well as 6 and 12 days post-partum. Parameters of antioxidative defence including total antioxidant capacity (TAC) and glutathione peroxidase (GSH-Px) as well as parameters of lipid (LPI) and protein (SH) peroxidation intensity were determined spectrophotometrically. Obtained results indicated dynamic changes in values of examined parameters during time of experiment, which were significantly marked between 24 and 48 h postpartum, and the relationship between mother and her newborn. All parameters except for GSH-Px were markedly higher in blood of newborns as in their mothers. Moreover, TAC and GSH-Px in colostrum were lower as in blood of mothers and their newborns during first 24 h and showed opposite relationship later on. LPI was higher in colostrum as in plasma of mothers and their newborns during first 48 h, while SH was lower in colostrum as in plasma of examined animals. Values of antioxidative parameters increased significantly within examined period of time, while the content of SH groups tended to decrease and lipid peroxidation intensity fluctuated.

Dynamics in changes of examined parameters may suggest temporary imbalance in antioxidative/oxidative status and adequate answer of organism to current challenge resulting from overproduction of reactive oxygen species. Present

study may bring new knowledge into studies of post-parturient and post-natal period in cows and calves and may help preventing from diseases of this period.

Publication: Reprod. Dom. Anim. 46, 763–769, 2011, fig. 4. In English, summary in English.

Iwona Janczarek, Witold Kędzierski

IS IT A GOOD IDEA TO TRAIN FILLIES AND COLTS SEPARATELY?

The aim of this study is to compare the physiological response to novel situations in sex-separated and sex-mixed groups of horses as measured by their heart rate (HR). The reason for this is to evaluate the possibility of training horses in a mixed-sex system. In this study 41 two and a half year old Purebred Arabian horses were studied during their first walk on an automated horse walker. The horses were divided into four groups according to their manner of care and training. Ten colts and 10 fillies were kept in separate stables and trained in separate male or female groups. There were also 12 colts and 9 fillies, which were kept in the same stable and trained together. Their HR was measured: at rest, during handling, when they were being taken from the stable to the automated horse walker, while they were walking on the horse walker, and finally while they were being walked back to their stalls. The mean HR scores recorded from training on the horse walker were higher in horses from the sex-mixed groups than from those in the sex-separated groups and amounted to 95.0 ± 3.19 vs 71.1 ± 3.57 , $p \leq 0.001$ in colts and 90.4 ± 5.32 vs 75.0 ± 4.00 , $p \leq 0.01$ in fillies, respectively. In conclusion, training young horses in sex-mixed groups is not recommended.

Publication: J. Appl. Anim. Welf. Sci. 14, 211–219, 2011, fig.2. In English, summary in English.

Iwona Janczarek, Witold Kędzierski

EMOTIONAL RESPONSE OF YOUNG RACE HORSES TO A TRANSFER FROM A FAMILIAR TO AN UNFAMILIAR ENVIRONMENT

The aim of this study was to measure emotional arousal in young race horses as expressed by heart rate (HR) during routine situations of grooming, hoof cleaning, and while at rest, having been transported from the environment of home stud farm to that of an unfamiliar training centre. A hypothesis was developed that the change of environment is a source of heavy stress for young race horses.

The investigation involved 22 Purebred Arabian stallions and 19 Purebred Arabian mares, 2.5 years old, and 11 Thoroughbred stallions and 10 Thoroughbred mares, at the age of 1.5 years. The horses were examined twice: first on their home stud farms, and then three days after being moved to an unfamiliar training centre. The HR was measured at rest and while the horses were being groomed in their boxes.

The HR registered during the grooming session at the new stable increased significantly in all studied groups of horses compared to the data obtained at their home stud farm. This increase was significantly higher in the groups of 1.5-year-old Thoroughbred stallions and mares than in the groups of 2.5-year-old Purebred Arabian horses.

Publication: Anim. Sci. Pap. Rep. 29, 205–212, 2011, fig. 2, tab. 1. In English, summary in English.

Iwona Janczarek, Witold Kędzierski

EMOTIONAL RESPONSE TO NOVELTY AND TO EXPECTATION OF NOVELTY IN YOUNG RACE HORSES

The aim of this study was to estimate the emotional response to novelty and to expectation of novelty in young race horses. The novelty in this study was the first training on an automated horse walker at a new training centre. To estimate the level of emotionality in horses, the telemetric measurement of heart rate (HR) was used. A hypothesis was developed that expectation of novelty can be as exciting for horses as a novelty test.

In this study 40 horses were studied just before and then during their first walk on an automated horse walker. They were divided into four groups. There were 10 horses in each group. These groups were: 1) 1.5 year old Thoroughbred colts, 2) 1.5 year old Thoroughbred fillies, 3) 2.5 year old Purebred Arabian colts, and 4) 2.5 year old Purebred Arabian fillies. The HR was measured: at rest, during handling and moving the horse from the stable, while walking on the automated horse walker for about 20 minutes, while moving the horse from the walker to the stable, and at rest after exercise.

HR response to the anticipation of novelty was higher in colts than in fillies, but especially so in the group of Thoroughbreds.

Publication: J. Equine Vet. Sci. 31, 549–554, 2011, fig. 2, tab. 1. In English, summary in English.

Witold Kędzierski

**CORRELATION OF PLASMA CREATINE KINASE ACTIVITY AND GLUCOSE LEVEL
IN EXERCISED PUREBRED ARABIAN HORSES**

This study tests the hypothesis found in professional literature, that increased plasma creatine kinase (CK) activity in horses is a direct result of a rise in the plasma glucose level.

Participants were 24 three-year-old Purebred Arabian mares and 67 three to six-year-old Purebred Arabian stallions. From the total of 91 horses, 29 of the horses were studied only once and 62 were studied two, three or four times. As a result, the total number of studied exercise tests amounted to 176. All horses were being tested whilst undergoing race training. On the days of the study, the horses took part in a conventional training session. Three blood samples from the jugular vein were collected from each horse. These samples were taken while: 1) at rest, 2) after the end of training session and 3) thirty min. after the end of effort. In the obtained plasma samples, glucose level and CK activity were determined using spectrophotometric diagnostic kits.

The exercise regime, which the studied horses had undertaken, evoked a statistically significant increase in both means of the analyzed parameters. An analysis of results using coefficient correlation indicated that there was no correlation between the changes in plasma glucose level and CK activity. Present study does not seem to support the hypothesis of increased plasma CK activity in horses being the result of a rise in the plasma glucose level.

Publication: Medycyna Wet. (Lublin) 67, 541–544, 2011, tab. 2. In English, summary in English.

Witold Kędzierski, Roland Kusy, Sylwester Kowalik

**PLASMA LEPTIN LEVEL IN HYPERLIPIDEMIC MARES
AND THEIR NEWBORN FOALS**

The aim of this study was to evaluate the relationship between plasma leptin and lipid levels in breeding mares and their newborn foals. The study was conducted on 17 Polish cold-blood mares and their newborn foals. The mares were divided into two groups, according to the course of delivery. These groups were: 7 mares which had a normal delivery and 10 mares which had required veterinary intervention during their delivery. Blood samples were taken from the jugular vein of both the mares and their foals. The blood samples were taken within 30 min after delivery, as well as on 4 successive mornings directly afterwards. In obtained plasma samples, the leptin, triacylglycerols (TG), and free fatty acids

(FFA) concentrations were measured. The leptin and TG levels in the plasma sampled on the day of delivery and the two following days were significantly higher in mares which received veterinary intervention during the delivery, when compared to the results obtained from the plasma of mares which had normal delivery. The results obtained from foals did not show any statistical differences. In conclusion, the conducted tests have shown that postparturient hyperlipidemia and hyperleptinemia in mares did not influence the lipid status and plasma leptin level in newborn foals.

Publication: Reprod. Dom. Anim. 46, 275–280, 2011, fig. 6. In English, summary in English.

Maciej Lopucki, Marta Kankofer, Agnieszka Grafka, Wanda Rogowska

**ANTIOXIDATIVE/OXIDATIVE PROFILE OF PERFUSED HUMAN PLACENTA
IN VITRO DURING EXPOSURE TO DIFFERENT DOSES OF MAGNETIC FIELD**

The aim of the study was to determine antioxidative/oxidative profile of human placenta upon exposure to different doses of magnetic field (MF) during perfusion in vitro as well as to prove if perfusion itself may influence this profile in the medium and the homogenates of placenta. The forty placentas obtained during physiological delivery were divided into 4 equal groups: control and B1, B2, B3 exposed to 0.5 mT, 2 mT and 5 mT of magnetic induction at 50 Hz MF during perfusion in vitro, which lasted for 180 min. Total antioxidant capacity (TAC) and intensity of lipid peroxidation (LPI) were determined spectrophotometrically in maternal and fetal perfusates as well as placental tissues. Obtained results showed significantly higher ($p < 0.05$) values of determined parameters in maternal compared to fetal perfusates. Moreover, values increased within the time of perfusion as well as increased with an increase of MF magnitude. TAC and LPI in homogenates exposed to MF showed significantly higher ($p < 0.05$) values after perfusion regardless of MF magnitude as compared to controls. In conclusion, human placental perfusion did not induce antioxidative/oxidative imbalance during the 150 min of experiment. The exposure to MF caused an increase of the oxidative parameters which were balanced by the increase in the antioxidative system showing a dynamic and temporary answer by the cells to an environmental stimulus.

Publication: Archiv. Perinatal Med. 17, 140–146, 2011, fig. 2, tab. 1. In English, summary in English.

Katarzyna Strzelec, Marta Kankofer, Sławomir Pietrzak

**CORTISOL CONCENTRATION IN THE SALIVA OF HORSES
SUBJECTED TO DIFFERENT KINDS OF EXERCISE**

The aim of this study was to characterize the stress level in sport horses subjected to exercise by measuring the cortisol concentration in their saliva. The experiment was conducted on 5 groups of horses (49 animals): one control and four groups undergoing different types of exercises. The saliva samples were collected 3 × a day: late at night (between 20:00 and 23:00 h), early in the morning (between 5:00 and 8:00 h) and directly after the exercise.

The concentration of cortisol was measured by the enzyme-immunoassay programme. The highest cortisol concentration was observed for the horses participating in 3-day events (8.93 nmol/dm³), whereas in the control group it was only 0.28 nmol/dm³. When compared to the cortisol concentration of other horse groups, this suggests that the stress level as measured by the cortisol concentration in saliva increases with increasing exercise intensity and its duration. The obtained results do not confirm the existence of a day rhythm of the cortisol concentration in horses. Moreover, the results may help in choosing the appropriate system of training and in improving horse welfare during competitions.

Publication: Acta Vet. Brno 80, 77–81, 2011, tab 1. In English, summary in English.

Jacek Wawrzykowski, Marta Kankofer

**CHANGES IN ACTIVITY DURING STORAGE AND CHARACTERISTICS
OF SUPEROXIDE DISMUTASE FROM HEN EGGS (*Gallus gallus domesticus*)**

Hen eggs are one of the most popular food stuffs. Moreover, they can be the source of not only nutrients but also factors of biological origin, which may be used for food preservation and food additives. The aim of the study was to determine and describe the activity of superoxide dismutase isoforms (SOD; EC 1.15.1.1) in hen eggs (*Gallus gallus domesticus*). Our electrophoretic studies confirmed the presence of SOD isoenzyme bands with molecular weight of 14–15 and 50–70 kDa in egg yolk. By contrast, in egg white, we confirmed the presence of a protein with molecular weight of 13–14 and 50–55 kDa. Zymographic pattern confirmed the activity of SOD isoforms of the enzyme present in the egg yolk; however, it did not confirm enzyme activity in egg white (at the level of error of the used method). Study has also shown SOD activity during storage at 4 EC for 9 days in egg yolk and egg white. In start time, SOD activity in egg yolk is clearly different from a small activity in the protein (respectively, 90.5 ±22.2

and $7.9 \pm 3.9 \text{ U g}^{-1}$). It did not change during 6 days storage but between 6th and 9th day, it decreased significantly in egg yolk while remained low but unchanged in egg white. Present study confirmed the presence of SOD and its activity in hen egg yolk.

Publication: Eur. Food Res. Technol. 232, 479–484, 2011, fig. 4, tab. 1. In English, summary in English.

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Publication: Proceedings of the LXXVI Congress of Polish Society of Animal Production, 176, 2011. In Polish.

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Publication: Reproduction in Domestic Animals 2011, 46, suppl 1, 21 (poster 52). In English.

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Publication: Proceedings of Annual Conference of The International Association for Medical Education in Europe, 72, 2011. In English.

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Publication: Proceedings of the VII International Equitation Science Conference, 23, 2011. In English.

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Ref.: LXIV Annual Conference of Physiology and Pathology of Reproduction and XXXVI Mutual Conference on Veterinary and Human Reproductive Medicine. Hannover, Germany, 16–18 II 2011.

Publication: Reproduction in Domestic Animals 2011, 46, suppl 1, 27 (poster 72). In English.

DEPARTMENT AND CLINIC OF ANIMAL INTERNAL DISEASES

Głęboka 30, Lublin

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Dr. habil. Krzysztof Lutnicki
Dr. habil. Jacek Madany

RESEARCH STUDIES (SUMMARIES)

Marcel Kovalik, Iwona Tazskun, Zbigniew Pomorski, Marian Kozak,
Dorota Pomorska, Marcin Szczepanik, Piotr Wilkołek, Lucas Palenik,
James Shaw, Adri van den Broek, Keith Thoday

EVALUATION OF HUMAN GENERIC FORMULATION OF CICLOSPORIN IN THE TREATMENT OF CANINE ATOPIC DERMATITIS WITH IN VITRO ASSESSMENT OF THE FUNCTIONAL CAPACITY OF PHAGOCYtic CELLS

To compare the efficacy, tolerability and safety of a generic formulation of ciclosporin for human beings with prednisone in the treatment of canine atopic dermatitis), human generic ciclosporin A (hgCsA) (5 mg/kg daily) and prednisone (1 mg/kg daily for seven days, followed by 1 mg/kg every second day) were administered to 13 and seven dogs with atopic dermatitis, respectively, for 42 days. Skin changes were assessed using a modified canine atopic dermatitis extent and severity index (mCADESI-01) and a pruritus intensity scale system. The in vitro functional capacity of phagocytic cells was assessed using the tetrazolium reductase activity and zymosan-stimulated tetrazolium reductase activity tests, as well as measurements of the percentage phagocytic activity and the ingestion capacity of phagocytic cells.

Haematological and biochemical parameters were also monitored. There was a greater than or equal to 50 per cent reduction from the baseline in mCADESI-01 scores in 84.6 and 100 per cent of dogs, and a greater than or equal to 50 per cent reduction from the baseline in pruritus scores in 76.9 and 85.7 per cent of dogs, treated with hgCsA and prednisone, respectively. No important adverse physical, haematological or biochemical effects occurred with either drug and no

statistically significant changes were detected in any of the four tests assessing the functional activity of phagocytes. The generic formulation of ciclosporin was effective in reducing the severity of physical signs of canine atopic dermatitis and was well tolerated.

Publication: Vet. Rec. 168, 20, 537–543, 2011, fig. 1. tab. 2. In English, summary in English.

Marcin Szczepanik, Piotr Wilkołek, Łukasz Adamek, Zbigniew Pomorski

**THE EXAMINATION OF BIOPHYSICAL PARAMETERS OF SKIN
(TRANSEPIDERMAL WATER LOSS, SKIN HYDRATION AND PH VALUE)
IN DIFFERENT BODY REGIONS ON NORMAL CATS AND OF BOTH SEXES**

The purpose of this study was to evaluate transepidermal water loss (TEWL), skin hydration and skin pH in normal cats. Twenty shorthaired European cats of both sexes were examined in the study. Measurements were taken from five different sites: the lumbar region, the axillary fossa, the inguinal region, the ventral abdominal region and the left thoracic region. In each of the regions, TEWL, skin hydration and skin pH were measured. The highest TEWL value was observed in the axillary fossa (18.22 g/h/m²) and the lowest in the lumbar region (10.53 g/h/m²). The highest skin hydration was found in the inguinal region (18.29 CU) and the lowest in the lumbar region (4.62 CU).

The highest skin pH was observed in the inguinal region (6.64) and the lowest in the lumbar region (6.39). Statistically significant differences in TEWL were observed between the lumbar region and the left side of the thorax region (P ≤ 0.016), the axillary fossa (P ≤ 0.0004), the ventral region (P ≤ 0.005), and the inguinal region (P ≤ 0.009). There were significant differences in skin hydration between the lumbar region and the left thorax (P ≤ 0.000003), the axillary fossa (P ≤ 0.002), the ventral abdomen (P ≤ 0.03), and the inguinal region (P ≤ 0.0003) as well as between the thorax and the ventral abdomen (P ≤ 0.005). TEWL was higher in females (15 g/h/m²) than in males (4.57 g/h/m²). Skin hydration was higher in females (13.89 CU) than in males (12.28 CU). Significant differences were not found between males and females for TEWL and skin hydration. Skin pH was higher in males (6.94) than in females (6.54), which was significant (P ≤ 0.004).

Publication: J. Fel. Med. Surg. 13, 224–230, 2011. In English, summary in English.

Iwona Taszkun

**THE RESULTS OF INTRADERMAL SKIN TESTS (IDST) IN DOGS
WITH ATOPIC DERMATITIS FROM THE LUBLIN VOIVODESHIP**

The purpose of this study was to assess the positive immediate reactions received from intradermal skin tests (IDST) which confirmed the presence of IgE-dependent hypersensitivity in dogs with atopic dermatitis, which were patients of the Dermatology Consulting Section at the University of Life Sciences in Lublin between 2007 and 2009. Intradermal skin tests were performed on 142 dogs (72 females and 70 males) from the Lublin voivodeship of different breeds ranging in age from 1 to 6 years (average 2.8 years). The allergen set used in this study was the Artuvetrin Test (ARTU Biologicals Europe B.V., Holland). The owners of 84 dogs observed the presence of skin lesions all year round regardless of season, while 58 dog owners noted them only in spring and summer. Most immediate positive reactions were ascertained from mite allergens (70.61%), fewer from pollen allergens (19.55%), and the fewest from animal (4.15%) and mould allergens (1.66%). Immediate positive reactions for a flea allergen (4.03% of all positive reactions) were also ascertained. In 98.6% of dogs polysensitization was found.

Publication: Polish J. Vet. Sci. 14, 95–101, 2011, fig. 2, tab. 2. In English, summary in English.

Piotr Wilkołek, Marcin Szczepanik, Marcin Golyński, Łukasz Adamek,
Agnieszka Pomorska, Mirosława Maj-Martyniuk, Wiesław Sitkowski

**THE EVALUATION OF SELECTED PARAMETERS OF CELLULAR
NONSPECIFIC IMMUNITY IN NORMAL AND ALLERGIC HORSES**

The main aim of this study was to compare selected nonspecific immunity parameters in 14 allergic and 12 healthy horses. Each animal was assessed according to the following parameters: in vitro functional capacity of phagocytic cells using the nitro blue tetrazolium chloride reduction test, both spontaneous (NBT) and zymozan stimulated (NBTs), and ingestion capacity of phagocytic cells using a phagocytic index test (IF) and percentage of phagocytosing neutrophils activity (% KF). Differences were demonstrated between the group of allergic horses, especially with severe allergy symptoms, and healthy horses in NBTs values, with higher values in healthy horses. The values of the phagocytic index were significantly higher in horses with allergy.

Publication: Polish J. Vet. Sci. 14, 287–288, 2011. In English, summary in English.

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Publication: Życie Wet. 86, 439–442, 2011. In Polish, summary in English.

DEPARTMENT AND CLINIC OF ANIMAL REPRODUCTION

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Prof. extraordin. Dr. habil. Leszek Krakowski,
Dr. habil. Marek Szczubiał

RESEARCH STUDIES (SUMMARIES)

Mariola Bochniarz, Władysław Wawron

ANTIBIOTIC SUSCEPTIBILITY OF METHICILLIN-RESISTANT AND METHICILLIN-SUSCEPTIBLE COAGULASE-NEGATIVE STAPHYLOCOCCI ISOLATED FROM BOVINE MASTITIS

The aim of the present study was to evaluate the antibiotic susceptibility of methicillin-susceptible (MS) and methicillin-resistant (MR) coagulase-negative staphylococcus (CNS) strains isolated from milk of cows with mastitis. The study was conducted on 100 CNS strains (20 MRCNS and 80 MSCNS) isolated from milk samples of 86 cows from the Lublin region farms. Antibiotic susceptibility of microorganisms was evaluated using the disc-diffusion method on the Mueller-Hinton agar according to the guidelines of the National Committee for Clinical Laboratory Standards (NCCLS). The highest efficacy against MSCNS was demonstrated for cephalosporin antibiotics, i.e. cefacetril (91.3%), ceftiofur (67.5%), cefoperazone (66.3%) and cephalexin (60.0% of susceptible MSCNS strains). Moreover, a high percentage of vancomycin-susceptible strains was demonstrated (83.8%). The activity of combination of amoxicillin with clavulanic acid and gentamicin was found weaker (63.8% and 61.3% of susceptible strains, respectively). About 50.0% of MSCNS were susceptible to erythromycin, enrofloxacin and amoxicillin. A large proportion of CNS was resistant to neomycin, penicillin, tetracycline, streptomycin, lincomycin and ampicillin (28.8%, 30.0%, 31.3%, 31.3%, 33.8% and 33.8% of susceptible strains, respectively). The highest percentage of MRCNS was susceptible to vancomycin

(75.0%), erythromycin (65.0%) and streptomycin (50.0%). Their susceptibility to enrofloxacin (35.0%) as well as gentamicin and tetracycline (30.0%) was markedly lower. The lowest activity was found for lincomycin and neomycin (20.0% of susceptible MRCNS strains, each).

Publication: Pol. J. Vet. Sci. 14, 405–410, 2011. In English, summary in English.

Piotr Brodzki, Zygmunt Wrona, Tomasz Piech, Adam Brodzki

EFFECTS OF CYTOSTATICS ON THE SELECTED PARAMETERS OF CELL-MEDIATED IMMUNITY IN DOGS

The aim of the study was to assess the effects of tamoxifen and cyclophosphamide on the selected cell-mediated immunity parameters in dogs. The study included 18 dogs aged 5–10 years. The experimental group consisted of 12 animals with neoplastic lesions classified as the first or second staging group (according to the WHO TMN classification). This group was divided into two subgroups: I – six dogs receiving oral tamoxifen, and II – six dogs administered oral cyclophosphamide. The control group included six healthy dogs. The blood was sampled from the saphenous access vein two times at 14 d intervals before the drug administration, 3 times every 7 d during administration, and 2 times every 14 d after completion of the therapy. The basic blood tests were carried out and the subpopulations of TCD4⁺ and TCD8⁺ lymphocytes were determined using flow cytometry. Moreover, the phagocytic activity of granulocytes and monocytes was determined using flow cytometry. It was found that tamoxifen induced a marked increase in WBC and neutrophil counts in peripheral blood; furthermore, it resulted in an increased phagocytic activity of monocytes and changed the CD4⁺:CD8⁺ ratio (in favour of cytotoxic lymphocyte subpopulation), which evidences the stimulation of cell-mediated immunity mechanisms. Cyclophosphamide caused a substantial decrease in the overall leukocyte pool and reduced the percentage of cells activated for phagocytosis, both neutrophils and monocytes even after completion of its administration, which proves its immunosuppressive effects.

Publication: Bull. Vet. Inst. Pulawy 55, 87–93, 2011. In English, summary in English.

Leszek Krakowski, Cezary Henryk Krawczyk, Krzysztof Kostro,
Tadeusz Stefaniak, Franciszek Nowotny, Justyna Obara

**SERUM LEVELS OF ACUTE PHASE PROTEINS: SAA, HP AND PROGESTERONE (P4)
IN MARES WITH EARLY EMBRYONIC DEATH**

The study involved 46 healthy purebred Arabian mares exhibiting regular oestrous cycles that underwent artificial insemination (AI). Pregnancy was detected ultrasonographically (US) in 40 mares. In 15 mares in foal, early embryonic death (EED) was observed during the pregnancy days 14–21. Blood for determinations of serum acute phase proteins (SAA and Hp) and progesterone (P4) was sampled 12–24 h before ovulation and the first insemination, at 12, 24, 72, 96 h and on day 7, 10, 14, 21, 35 and 55 after ovulation. The results revealed that in 25 mares without EED, the serum levels of P4, SAA and Hp were within physiological limits; in 15 mares with EED, the levels of SAA and Hp were significantly increased. In seven mares with EED, high levels of SAA and Hp were already found before ovulation and at 12, 24, 72, 96 h as well as on day 7 and 10 post-ovulation, whereas the level of P4 was normal for early pregnancy. In the remaining eight mares with EED, increased levels of SAA and Hp were found at 72 h after ovulation and maintained until day 55. In this group, the level of P4 decreased since 96 h after ovulation. Determinations of SAA, Hp and P4 in mares in early pregnancy (EP) are useful for monitoring normal development of pregnancy and for diagnosis of subclinical genital inflammations, which may lead to EED.

Publication: Reprod. Dom. Anim. 46, 624–629, 2011. In English, summary in English.

Marek Szczubiał, Marta Kankofer, Roman Dąbrowski

**ANTIOXIDATIVE-RELATED ACTIVITIES OF LAKTOFERRIN
AND LACTOPEROXIDASE IN MILK FROM COWS
WITH DIFFERENT FORMS OF MASTITIS**

The aim of the study was to compare antioxidative-related activity of milk from cows with various forms of clinical mastitis and subclinical mastitis by use of the determination of activity of lactoferrin (LF) and lactoperoxidase (LP). Samples were taken from: 14 cows with acute mastitis, 18 cows with subacute mastitis, 16 cows with chronic mastitis, 26 cows with subclinical mastitis and 14 healthy cows. The mean activity of LF in milk from mastitic cows ranged from 8.9 ± 3.0 to 12.1 ± 6.9 mU/g protein and was significantly lower than that in milk from healthy cows (29.5 ± 15.0 mU/g protein). In group of mastitic cows the

highest LF activity was found in cows with chronic mastitis, the lowest one in those with subclinical mastitis. The LP activity in cows with clinical and subclinical mastitis was significantly higher than in healthy cows (1.3 ± 1.1 mU/g protein) ranging from 5.5 ± 2.6 mU/g protein in subclinical mastitic cows to 8.4 ± 5.0 mU/g protein in chronic mastitic cows. Lower LF activities in cows with mastitis than in healthy animals may lead to a decreased antioxidant defence system in mastitic cows.

Publication: Bull. Vet. Inst. Pulawy 55, 77–81, 2011. In English, summary in English.

Marek Szczubiał, Wojciech Łopuszyński

PROGNOSTIC VALUE OF REGIONAL LYMPH NODE STATUS IN CANINE MAMMARY CARCINOMAS

In this study we have determined the prognostic value of the regional lymph node micrometastases and metastases larger than 2 mm for bitches with mammary tumours. The study involved 54 dogs diagnosed with a single malignant epithelial tumour in the 4th or 5th mammary gland. All dogs underwent regional mastectomy; the 4th and 5th mammary glands were removed together with the inguinal lymph node. The lymph nodes were examined immunohistochemically using the anti-cytokeratin antibody, clone AE1/AE3. After surgery, dogs were examined at 6-month intervals over the period of 24 months to determine the disease-free survival (DFS) and overall survival (OS). The Kaplan-Meier analysis showed a statistically significant difference in DFS and OS only between the group of bitches without metastases and the group with lymph node metastases bigger than 2 mm. No significant differences between these two groups versus bitches with lymph node metastases < 2 mm were found.

Publication: Vet. Comp. Oncolog. 9, 296–303, 2011. In English, summary in English.

Władysław Wawron, Mariola Bochniarz, Marek Szczubiał

ENZYMATIC ACTIVITY OF YEASTS ISOLATED FROM THE INFLAMED MAMMARY SECRETION IN DAIRY COWS

The aim of the study was to evaluate enzymatic activities of yeasts isolated from inflammatory mammary secretion. The yeasts isolated from cows with clinical and sub-clinical *mastitis* (134 strains) included: *Candida krusei* (62 strains), *Candida kefyr* (48 strains), *Candida lusitanae* (17 strains) and *Candida famata* (7 strains). The API ZYM system was used containing substrates to as-

sess 19 hydrolytic enzymes. Substantial differences in the number and activity of hydrolyses were demonstrated in individual species. In *Candida krusei*, acid phosphatase showed the highest activity (4.36 points), in *Candida kefyr* and *Candida lusitanae* – leucine arylamidase (4.93 and 4.25 points, respectively), in *Candida famata* – α -glucosidase (4.75 points). No activity of trypsin, chymotrypsin, α -galactosidase, β -glucuronidase, α -mannosidase or α -fucosidase was observed in any of the yeasts examined.

Publication: Pol. J. Vet. Sci. 14, 65–68, 2011. In English, summary in English.

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Publication: Magazyn Wet. 20, 1237–1239, 2011. In Polish.

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Publication: Magazyn Wet. 20, 347–348, 2011. In Polish.

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Publication: Med. Wet. 67, 343–346, 2011. In Polish, summary in English.

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Publication: Weterynaria w terenie 8, 56–58, 2011. In Polish.

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Publication: Weterynaria w terenie 5, 42–46, 2011. In Polish.

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Publication: Bydło 6, 58–60, 2011. In Polish.

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Publication: Weterynaria w terenie 5, 44–48, 2011. In Polish.

DEPARTMENT AND CLINIC OF ANIMAL SURGERY

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RESEARCH STUDIES (SUMMARIES)

Ireneusz Balicki, Krzysztof Radziejewski, Wojciech Bielecki

EVALUATION OF CORNEAL AND CONJUNCTIVAL EPITHELIUM WITH USE OF IMPRESSION CYTOLOGY IN MIX-BREED DOGS DIAGNOSED WITH KERATOCONJUNCTIVITIS SICCA

The purpose of the study was evaluation of corneal and conjunctival cells with the use of impression cytology at various stages of keratoconjunctivitis sicca (KCS) advancement in mixed-breed dogs. The study was conducted on 18 mixed-breed dogs, aged 2.5 to 10 years. All patients were diagnosed with immune-mediated KCS during an ophthalmological exam. A total of 33 corneas and conjunctivae were affected by the disease. Based on the results of Schirmer's test (STT), the patients were divided into 3 groups of 6 animals each. In group I the STT score was within the range of 0-5 mm, in group II 6-10 mm, and in group III 11-14 mm. Impression cytology exams of bulbar conjunctiva and cornea were performed with the use of round milipore filters applied over the examined surfaces. One disk was used to sample material from the superior and inferior temporal quadrants of the cornea and the adjacent bulbar conjunctiva, a second disk was applied on palpebral conjunctiva surface of the palpebra superior. The disks were subsequently stained using the PAS method. The cytological analysis of corneal and conjunctival epithelium cells was performed according to the 4 grade Nelson-Adams index. In the impression cytology preparations obtained from patients diagnosed with advanced stages of KCS, significant progression of epithelial cell metaplasia in the cornea and conjunctiva was observed – classified as grade 3 according to the Nelson-Adams index. It was observed

also that the degree of corneal and conjunctival cell metaplasia advancement in KCS patients increased with the decrease of STT values. The presence of goblet cells was not observed in either bulbar or palpebral conjunctiva, regardless of KCS advancement. Impression cytology is a simple and non-invasive method of examining the conjunctival and corneal epithelium and allows close monitoring of the disease process in dogs diagnosed with KCS.

Publication: Bull. Vet. Inst. Pulawy 55, 93–499, 2011, fig. 5, tab. 3. In English, summary in English.

Adam Brodzki, Piotr Silmanowicz, Piotr Brodzki, Piotr Dębiak

**NOVEL SURGICAL TREATMENT OF CORPORA ALIENA
LOCATED IN ESOPHAGUS OF DOG PUP**

Chirurgische Behandlung eines Fremdkörpers im zervikalen Teil des Ösophagus lines

Corpora aliena located in esophagus is serious clinical problem for treatment in veterinary practice. Currently available literature presents various methods of surgical and conservative treatment. The authors of the paper report pioneering treatment of large esophagus wall damage via granulation process in dog pup. This kind of surgical treatment of esophageal injuries was applied and reported previously in large animals only. Considering that simple surgical union of large esophageal damages and extensive cicatrice formation would diminish esophageal diameter and disturb food passage in dog pup, performed treatment may be considered as very effective. Furthermore, it may be routinely used in small animal practice for treatment of such cases.

Publication: Hundewelpen. Tierarztl. Umschau (Dieseldorf) 66, 258–261, 2011, fig. 4. In German, summary in German and English.

Piotr Brodzki, Adam Brodzki, Roman Dąbrowski

OVARIAN CAPSULE ABSCESS IN A BITCH FOLLOWING SPAYING

Ropień torebki jajnikowej u sukki po zabiegu sterylizacji

Reproductive system disorders in bitches are commonplace for small animal veterinary surgeons. Surgical intervention is very often considered as an effective treatment in such cases. Ovariohysterectomy in bitches is the most common surgical procedure on the reproductive system for inducing surgical contraception. Numerous advantages as well as disadvantages may result from ovariohys-

terectomy, especially when one considers the possibility of an inappropriate course of the surgical procedure and resultant complications. This case report describes the presence of an ovarian capsule abscess in a bitch as a post-surgery complication due to failed surgical removal of the ovary. Moderate weakness, apathy, reduced feed consumption, periodical vomiting and modest polydipsia were observed as clinical symptoms in the bitch. Surgical removal of the pathologically changed ovary and its capsule was performed as an effective treatment that was followed by relevant pharmacotherapy. It is worth mentioning here that spaying a bitch without total removal of the ovaries may have positive consequences such as hormonal prevention of urinary inconsistency or obesity. On the other hand, among the negative consequences, vaginal prolapse, neoplastic transformation, ovarian tumor growth and ovarian capsule abscess are listed. All these possible conditions need to be clearly explained to the owner before the planned surgery.

Publication: Medycyna Wet. (Lublin) 67, 705–708, 2011, fig. 3. In Polish, summary in English.

Elżbieta Pamuła, Elżbieta Menaszek, Maciej Orzelski, Piotr Silmanowicz,
Małgorzata Krok, Łucja Rumian, Piotr Dobrzyński

**POLYMERIC SCAFFOLDS WITH CONTROLLED MICROSTRUCTURE
AND SURFACE CHEMISTRY: MECHANICAL AND PHYSICO-CHEMICAL
CHARACTERISATION AND VIVO EVALUATION**

Scaffolds made of resorbable polymers, for example copolymers of lactide and glycolide (PLGA), are very promising biomaterials for bone and cartilage tissue engineering and regeneration. It was found that they provide temporary matrix enhancing cells adhesion, proliferation and their osteogenic/chondrogenic differentiation. Our previous experiments showed that the scaffolds produced from PLGA support growth and differentiation of osteogenic cells in vitro. Interestingly, the scaffolds with bigger pores (400–600 µm) were found to be the most appropriate for cell adhesion, proliferation and differentiation in vitro. We attributed it to higher pore interconnectivity and scaffold permeability, thus assuring better diffusion of nutrients, wastes and/or material degradation products in the whole volume of the scaffold. Moreover, we have shown that the PLGA scaffolds can be modified with hydroxyapatite (HAp), the most abundant mineral phase in natural bone, which assured better conditions to adhering cells and promoted their osteogenic differentiation. The aim of this study was to analyze tissue healing in critical-size osteochondral defects treated with different PLGA scaffolds in a rabbit model. Particularly we wanted to explore the influence of

pore size and presence of Hap in the PLGA scaffolds on bone and cartilage tissue healing in a short-term study.

Publication: Eng. Biomat. (Kraków) 105, 2–4, 2011, fig. 3, tab. 1. In English, summary in English.

Paweł Różański, Dorota Różańska, Henryk Krukowski

OCCURRENCE OF *Clostridium tetani* IN HORSE BREEDING ENVIRONMENT

Występowanie *Clostridium tetani* w środowisku hodowlanym koni

At the age of promoting the spending of an active free time, the risk of tetanus infection among people who have contact with horses by practicing horse riding as a sport, or even recreationally, is not in doubt. The isolation of toxigenic strains of *Clostridium tetani* in the horse breeding environment carried out in the presented study confirmed the actual risk of contracting tetanus by humans and animals. The objective of the study was an attempt to isolate *Clostridium tetani* from the horse breeding environment. The studies were conducted in 2 horse breeding centres and 1 private horse riding centre. The material for the study were 8 samples each of: hay and oats, horse stable dust, faeces, straw bedding and soil. At each centre, samples were collected according to the same scheme. Out of each 8 samples from individual objects, 1 collective sample was produced, which was considered as a representative sample. The bacterial colonies possessing characteristics typical of *Clostridium tetani* were isolated from the samples of: faeces, bedding, dust and fodder, whereas no such bacteria were cultivated from surface layers of soil temporarily or permanently remaining under the effect of sunshine. Based on the results obtained, it was noted that the biological material from the horse breeding environment contained *Cl. tetani* bacteria, therefore creating risk for life and health of humans and animals.

Publication: Medycyna Ogólna i Nauki o Zdrowiu 17, 7–11, 2011, fig. 4, tab. 1. In Polish, summary in English.

Anna Stachurska, Ryszard Kolstrung, Mirosław Pięta, Piotr Silmanowicz

HOOF SIZE AS RELATED TO BODY SIZE IN THE HORSE (*Equus caballus*)

The study was conducted to find one the most reliable parameter of the hoof size in relation to the horse body size, exemplified in mares. The mares of four breeds belonging to different origin types were examined: Purebred Arabian, halfbred Anglo-Arabian, Primitive Polish Konik and Polish Cold-Blood, 77

mares in total. Three body measurements were taken: height at withers, chest circumference and cannon circumference. The boniness index was also defined. After trimming three left fore hoof measurements were taken: toe length, solar length, and hoof width. Total length and width were calculated as a hoof solar size measure. On the basis of the parameters obtained, nine fore hoof to body dimension ratios were defined. The results show the hoof to body dimension ratios grow according to the increasing cannon circumference to height at withers ratio. The hoof width to chest circumference ratio was found to be useful parameter of the hoof size. The means (%) obtained in Purebred Arabian, Anglo-Arabian, Polish Konik and Polish Cold-Blood horses, are suggested as standards to which individual ratio in mares of similar breeds may be compared judging the horse's conformation. The age hardly affected the hoof solar size to height at withers ratio in mares four to nine years old.

Publication: Animal Sci. Papers and Reports 29, 213–222, 2011, tab. 5. In English, summary in English.

Brygida Ślaska, Paweł Róžański, Dorota Róžańska, Sylwia Nisztuk

DIFFERENTIATION OF *Candida* SPECIES AND *Candida rugosa* STRAINS WITH THE USE OF MOLECULAR MARKERS IN HEALTHY HORSES

The aim of the study was identification of molecular markers useful in differentiating the species of selected yeast-like fungi on the skin and mucous membranes of horses and in identification of *Candida rugosa* strains. The study material was smears from horse skin and mucous membranes. The isolates were assayed with the use of API 20C AUX (bioMérieux) biochemical tests. The examinations involved *C. lusitaniae*, *C. parapsilosis* and *C. rugosa*. RAPD-PCR analyses included amplification with the use of 20 arbitrary primers (OPG01-OPG20). Genetic distances between the *Candida rugosa* strains were estimated by the Popgen32 programme. The RAPD-PCR analysis yielded amplification products of all the markers used in the study. The number of species-specific DNA fragments ranged from 0 to 6, depending on the primer. At least two species-specific DNA fragments were found for each of the studied species in the case of primers OPG04, OPG05, OPG06, OPG09, OPG11 and OPG14, which may indicate the possibility of their use for species identification. The present work is the first attempt to describe genetic differences between *Candida rugosa* strains sampled from healthy Hucul horses. Four genotypes within the *Candida rugosa* species, whose frequency ranged from 0.06 to 0.62, were obtained upon combination of DNA profiles of three primers (OPG04, OPG05 and OPG11). The genetic distances identified indicated considerable diversity of the studied

strains. The genetic diversity may corroborate different environmental epidemiologic sources of the strains and may be related to their non-pathogenic nature.

Publication: Annales UMCS sectio EE Zootechnica, 29, 113–124, 2011, fig. 5, tab. 3. In English, summary in English.

Alexandra Trbolova, Ireneusz Balicki, Martina Mihalova

RENAL CAPSULE GRAFTS IN THE THERAPY OF CORNEAL DEFECTS

Verwendung von Nierenkapsulgewebe zur Therapie einer Keratitis profunda

The healing process of corneal ulceration after the application of a canine renal capsule graft was investigated experimentally in rabbits and clinically in canine patients. Unilateral keratectomy was performed experimentally in ten New Zealand White rabbits. The animals in Group 1 (n = 5) were treated using a third eyelid flap, while the animals of Group 2 (n = 5) were treated by the placement of a renal capsule graft. Blepharospasm, ocular discharge, corneal oedema and vascularisation, and fluorescein test results were monitored on days 1, 3, 5, 7, 15, 30 and 60 postoperatively. Histological examinations of the corneas were done in both groups on days 30, 45 and 60. The rabbits with renal capsule graft had blepharospasm, ocular discharge, corneal oedema and vascularisation, although the normal thickness and adhesiveness of the corneal epithelium could be proven histologically. Subsequently, renal capsule grafts were used in 14 dogs with corneal ulceration. The course of corneal repair was evaluated, as well as state of the eye after three months. There were no complications during corneal healing in 57.14% of corneal defect cases in the dogs. In the other patients, breakdown of graft suture, uveitis, corneal oedema and vascularisation occurred. Vision was saved in 13 cases (92.86%), in ten of them (76.92%) only partially. Visual impairment was caused by corneal scar, pigmentation or oedema, or uveal synechiae. There was one case of cataract as well. In conclusion, renal capsule grafts are useful in corneal ulcer treatment, including deep ones; however, when they are used in the treatment of corneal perforations, the result was synechiae in most cases. The renal capsule grafts as foreign matter evoked oedema, vascularisation or pigmentation of cornea affecting vision.

Publication: Kleinierpraxis (Hanover) 56, 57–66, 2011, fig. 7, tab. 2. In German, summary in English and German.

REPORTS TO RESEARCH MEETINGS

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Ref. European College of Veterinary Ophthalmologists Conference, Berlin 20–21 V 2011.
Publication: Proceedings of ECVO Conference, 40, 2011, in English.

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TRBOLOVA A., BALICKI I.: Exophthalmia in dogs, diagnosis and management. (Wyrzeszcz u psów – diagnostyka i terapia).
Publication: Magazyn Wet. 20, 464–468, 2011. In Polish, summary in English.

BALICKI I., BRYŁA P.: Collie eye anomaly. (Anomalia oczu owczarków collie).
Publication: Okulistyka Wet. 1, 2–3, 2011. In Polish, summary in English.

SILMANOWICZ P., ŻYLIŃSKA B., RÓŻAŃSKA D.: Empyema of the frontal sinus in the Irish Wolfhound. (Ropniak zatoki czołowej u wilczarza irlandzkiego).
Publication: Magazyn Wet. 20, 286–289, 2011. In Polish, summary in English.

ŻYLIŃSKA B., ORZELSKI M., SILMANOWICZ P.: Patellar fracture in a cat – case report. (Złamanie rzepki u kota – opis przypadku).
Publication: Magazyn Wet. 20, 302–306, 2011. In Polish, summary in English.

LABORATORY OF VETERINARY RADIOLOGY AND ULTRASONOGRAPHY

Głęboka 30, Lublin

Head: Dr. Renata Komsta

RESEARCH STUDIES (SUMMARIES)

Anna Łojarczyk-Szczepaniak, Renata Komsta, Piotr Dębiak

RETROSTERNAL (MORGAGNI) DIAPHRAGMATIC HERNIA

The paper reports a case of a dog with a Morgagni congenital diaphragmatic hernia which has a rare incidence in animals. The diagnosis was based on the radiographs of the abdominal cavity and thorax as well as contrast examination of the gastrointestinal tract. The initial examinations had not showed the presence of a hernia, while the subsequent ones performed after a 2-month period visualized multiple bowel loops located in the sternocostal trigone space and on the left side of the pleura cavity.

The objective of the research is to highlight the diagnostic challenge related with congenital diaphragmatic hernia recognition. The diaphragmatic defects may be too small to produce a hernia. Only under conducive conditions, herniation of the intra-abdominal organs to the thoracic cavity may implicate the occurrence or exacerbation of the clinical symptoms and thereby the delayed diagnosis of the disorder.

Publication: Canadian Vet. J. 52, 878–883, 2011, fig. 6. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

ŁOJSZCZYK-SZCZEPANIAK A.: Analysis of the causes of lameness in large and giant breed dogs observed during the years 1990–2007 in the east region of Poland: retrospective research.

Ref. EVDI Annual Meeting, London, August 30 – September 3, 2011.

Publication: EVDI Scientific Proceedings, 34, 2011. In English.

DĘBIAK P., ŁOJSZCZYK-SZCZEPANIAK A.: Ultrasonographic evaluation of testicular tumors in dogs.

Ref. EVDI Annual Meeting, London, August 30 – September 3, 2011.

Publication: EVDI Scientific Proceedings, 107, 2011. In English.

OTHER PUBLICATIONS

ŁOJSZCZYK-SZCZEPANIAK A., SZCZEPANIAK K.: Radiological evaluation of reptiles. (Diagnostyka radiologiczna u gadów – wyzwania i możliwości).

Publication: Magazyn Wet. 20, 697–702, 2011. In Polish, summary in English.

DĘBIAK P., TWARDOWSKI P., KOMSTA R.: Radiological aspect of difficult urination in dogs. (Utrudnione oddawanie moczu u psów w aspekcie radiologicznym).

Publication: Magazyn Wet. 20, 184–188, 2011. In Polish, summary in English.

KOMSTA R., TWARDOWSKI P., LISIAK B.: Post-traumatic thoracic radiography in dogs. (Radiografia klatki piersiowej u psów po urazie).

Publication: Weterynaria w praktyce 8, 17–25, 2011. In Polish, summary in English.

ŁOJSZCZYK-SZCZEPANIAK A., DĘBIAK P., TWARDOWSKI P.: Radiological examination of the normal heart. (Badanie radiologiczne serca w warunkach prawidłowych).

Publication: Magazyn Wet. 20, 1104–1108, 2011. In Polish, summary In English.

DEPARTMENT OF EPIZOOTIOLOGY AND CLINIC OF INFECTIOUS DISEASES

Głęboka 30, Lublin

Head: Prof. ordin. Dr. habil. Stanisław Winiarczyk
Prof. ordin. Dr. habil. Zbigniew Grądziński
Prof. ordin. Dr. habil. Krzysztof Kostro

RESEARCH STUDIES (SUMMARIES)

Lukasz Adaszek, Marta Górna, Michał Krzysiak, Michał Adaszek,
Marcin Garbal, Stanisław Winiarczyk

THE IDENTIFICATION OF PIROPLASMS ISOLATED FROM HORSES WITH THE CLINICAL DISEASE CASES IN POLAND

The study was aimed at determining the cause of the diseases in 3 horses exhibiting symptoms of fever, ataxia, paleness of mucus membranes, hematuria and thrombocytopenia. The PCR technique revealed the presence in the blood of 18S RNA Babesia/Theileria spp genetic material. DNA amplification by means of primers RLB F2 and RLB R2 gave a product with a size of 430 bp. The sequences of the PCR products obtained showed a 95,6–97,2 similarity with a sequence of a fragment of 18S RNA Babesia equi, gene number DQ287951 in the GenBank. The treatment involved the subcutaneous application of imidocarb and resulted in a gradual recovery of the sick animals

Publication: Wiad. Parazytol. 57, 21–26, 2011, fig. 3, tab. 2. In English.

Lukasz Adaszek, Alfonso Carbonero Martinez, Stanisław Winiarczyk

THE FACTORS AFFECTING THE DISTRIBUTION OF BABESIOSIS IN DOGS IN POLAND

The aim of this paper was to determine the factors affecting the development of canine babesiosis in Poland. The studies included 800 animals from 16 Polish voivodeships-districts (50 from each voivodeship) with suspected piroplasmosis.

Haematological and molecular tests confirmed infections in 158 animals. Analysis of the genetic material using the Real-Time Sybr Green HRM technique showed that 96 dogs were infected with *Babesia canis* 18S RNA-A and 62 with *Babesia canis* 18S RNA-B. It was observed that the disease occurs more often in eastern Poland (OR: 8.91; CI: 5.7–13.8), in males (OR: 1.04; CI: 0.7–1.5) and especially in rural areas (OR: 1.7; CI: 1.2–2.4). More prone to infection were pure-bred dogs (OR: 2.24; CI: 1.6–3.2), young animals under 1 year old (OR: 0.73; CI: 0.4–1.5), animals that had suffered from babesiosis in the past (OR: 17.9; CI: 10.9–29.2) and those that had not received preventive measures against ectoparasites (OR: 0.32; CI: 0.2–0.5). Knowledge of the factors facilitating the development of canine babesiosis helps to understand the causal connection between the dogs' exposure to the pathogen and the development of the disease and to limit the occurrence of the infection in these animals, to diagnose it early and to start proper treatment before serious complications develop.

Publication: Vet. Parasitol. 181, 160-165, 2011, fig. 1, tab. 6. In English, summary in English.

Łukasz Adaszek, Aleksandra Kuta, Marcin Kalinowski, Renata Urban-Chmiel,
Jerzy Rola, Jerzy Ziętek, Stanisław Winiarczyk

MOLECULAR ANALYSIS OF THE FRAGMENT OF BHV-1 VIRAL GLYCOPROTEIN gC ISOLATED FROM CALVES IN EASTERN POLAND

The aim of this study was to perform the molecular analysis of the BHV-1 virus glycoprotein gC isolated from calves in eastern Poland. 191 nasal swabs were taken from calves with clinical symptoms of bronchopneumonia. DNA of BHV-1 DNA was detected by the SYBR Green Real-Time PCR HRM in 45 swab. Fifteen randomly selected PCR products of Real-Time PCR were sequenced, and the obtained sequences were compared with each other and with the sequence of the gC gene of BHV-1 strain that originates from an online database of NCBI GenBank: Z49223.

Based on analysis of the obtained sequences, three polymorphic variants of BHV1 (No.1–3) with homology of 99.7–100% were distinguished. The nucleotide and amino acid sequences of the most frequently represented polymorphic variant No. 1 differed from the nucleotide sequences of polymorphic variants 2 and 3, with two and one substitution respectively. The amino acid sequence of gC gene of BHV-1 Z49223 differed from the analogous sequences of representatives variant No. 1 with 11 substitutions and 3 insertions. A little nucleotide differences in the gC BHV-1 gene among the examined viruses suggest that the

infections in calves were caused by relatively genetically stable virus, that occurs in the eastern Poland.

Publication: Medycyna Wet. (Lublin), 67, 322–326, 2011, fig.4, tab. 3. In Polish, summary in English.

Łukasz Adaszek, Stanisław Winiarczyk

**In VITRO CULTIVATION OF *Babesia canis canis* PARASITES
ISOLATED FROM DOGS IN POLAND**

The aim of this study was to perform in vitro cultivation of *Babesia canis* protozoa isolated from dogs with clinical babesiosis. A primary culture initiated in RPMI-1640 medium supplemented with 40% canine serum supported parasite growth in vitro in 5% carbon dioxide in air atmosphere. Subsequent subcultures into HL-1 medium with 40% dog serum or EMEM with 40% fetal bovine serum also supported parasite propagation. The parasites have been continuously cultured through 6 passages, although the parasitemias are low, ranging from 0,56-0,59%. The partial small subunit ribosomal rRNA gene sequence was identical in blood-derived and culture-derived *Babesia*. The parasites from 17 cultures were classified as EU622792, and from 13 cultures as EU622793. These data show that an efficient in vitro cultivation of *Babesia canis* could serve as a starting point to obtain a protozoan antigen used for immunization of the dogs against piroplasmiasis.

Publication: Parasitol. Res. 108, 1303–1307, 2011, fig. 2, tab. 1. In English, summary in English.

Łukasz Adaszek, Stanisław Winiarczyk

**IDENTIFICATION OF ANAPLASMA SPP. RICKETTSIA ISOLATED FROM HORSES
FROM CLINICAL DISEASE CASES IN POLAND**

This study was aimed at determining the cause of the diseases in 5 horses exhibiting symptoms of fever, joint oedema and ataxia, and thrombocytopenia. The PCR technique revealed the presence in the blood of 16S RNA *Anaplasma/Ehrlichia* spp. genetic material. DNA amplification with primers EHR 521 and EHR 747 gave a product with a size of 247 bp. The sequence of the PCR product obtained showed a 97,6–99,6% similarity with a sequence of a fragment of 16S RNA *Anaplasma phagocytophilum*, gene number EU 090186

from Genbank. Intravenous administration of oxytetracycline at a dose of 8 mg/kg of body mass for 7 days resulted in a gradual recovery.

Publication: Zoonoses Public Health 58, 514–518, 2011, fig. 1, tab. 1. In English, summary in English.

Krzysztof Kostro, Magdalena Gajęcka, Urszula Lisiecka,
Barbara Majer-Dziedzic, Kazimierz Obremski, Łukasz Zielonka, Maciej Gajęcki

**SUBPOPULATION OF LYMPHOCYTES CD4⁺ AND CD8⁺
IN PERIPHERAL BLOOD OF SHEEP WITH ZEARELENONE MYCOTOXICOSIS**

Subpopulacja limfocytów CD4⁺ i CD8⁺ we krwi obwodowej owiec z objawami mykotokсыkozy wywołanej zearalenonem

In sheep raised in chamber system and fed concentrate fodder containing high dose of zearalenone and its metabolite (α -zearalenol), the clinical course of zearalenonosis was diagnosed. Control animals were kept on grazing-land from the spring to the late autumn, and only in winter time they were fed shredded wheat with the lowest concentration of zearalenone. These sheep showed no clinical symptoms of the mycotoxycosis. Zearalenone and α -zearalenol cause immunosuppression, which means that lymphocyte T CD4⁺ and lymphocyte T CD8⁺ percentages decline and CD4/CD8 ratio increases when compared with control animals. Zearalenone mycotoxin suppression effect modulates cellular immunological response, which is essential in suppression of post-vaccination immunity and infectious diseases development despite applying normal specific immunoprophylaxis.

Publication: Bull. Vet. Inst. Pulawy 55, 241–246, 2011, fig. 4, tab. 2. In English, summary in English.

Katarzyna Surma-Kurusiewicz, Dorota Luft-Deptuła, Łukasz Adaszek,
Marcin Kalinowski, Jerzy Ziętek, Stanisław Winiarczyk

***Chromobacterium violaceum* INFECTION IN ONE DOG**

The aim of this paper was to present the first case of otitis externa caused by *Chromobacterium violaceum* in a dog in Poland. The studies involved a cross-breed dog aged 10 years with symptoms of chronic inflammation of the external auditory meatus. Inflammatory lesions of the external auditory meatus occurred directly after the dog swam in open water. Swabs were collected from the dog's ears for microbiological and parasitological tests. No parasites were observed that could cause the inflammation of the external auditory meatus. From a cul-

ture of the inflammatory secretion from the ears on the blood agar, a clean culture of violet bacteria was isolated and recognized as *Chromobacterium violaceum* based on an Api 20 test. Targeted therapy with antibiotics based on the systemic and local use of fluoroquinolones led to a complete resolution of the symptoms within two weeks. Based on the results of the conducted clinical and microbiological tests, along with the effect of the treatment, it was concluded that the etiological factor for the inflammation of external auditory meatus in the dog were *Chromobacterium violaceum* microbes.

Publication: Medycyna Wet. (Lublin), 67, 426–427, 2011, In English.

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Publication: Życie Wet. 86, 889–893, 2011. In Polish, summary in English.

ADASZEK Ł., BAZAN J., SURMA-KURUSIEWICZ J., GÓRNA M., GARBAL M., KUTRZUBA J., WINIARCZYK S.: Molecular analysis of the nucleoproteine gene fragment of the equine arteritis virus, isolated from the sperm of the stallions-persistently infected by EAV. Analiza molekularna fragmentu genu nukleoproteiny wirusa zapalenia tętnic koni izolowanego z nasienia trwałych siewców wirusa.

Publication: Życie Wet. 86, 452–455, 2011. In Polish, summary in English.

ADASZEK Ł., KOTOWICZ W., GÓRNA M., KUTRZUBA J., WINIARCZYK S.: Cases of borreliosis in horses. (Przypadki boreliozy u koni).

Publication: Życie Wet. 86, 53–56, 2011. In Polish, summary in English.

ADASZEK Ł., KOTOWICZ W., KLIMIUK P., GÓRNA M., WINIARCZYK S.: The severe granulocytic anaplasmosis in a dog – a case study. (Ostry przebieg anaplazmozy granulocytarnej u psa – przypadek własny).

Publication: Weterynaria w praktyce 8, 59–62, 2011. In Polish, summary in English.

ADASZEK Ł., KUTRZUBA J., KLIMIUK P., WINIARCZYK S.: Lymphomas in feline leukemia. (Chłoniaki w przebiegu białaczki u kotów).

Publication: Weterynaria w praktyce 8, 22–24, 2011. In Polish, summary in English.

ADASZEK Ł., POLICHT K., GÓRNA M., KUTRZUBA J., WINIARCZYK S.: The first case of anaplasmosis (ehrlichiosis) in a cat in Poland. (Pierwszy w Polsce przypadek anaplazmozy (erlichiozy) granulocytarnej u kota).

Publication: Życie Wet. 86, 132–135, 2011. In Polish, summary in English.

ADASZEK Ł., WINIARCZYK S.: Current knowledge about dog babesiosis (piroplasmosis). Part I – nature of the disease. (Aktualny stan wiedzy na temat babeszjozy (piroplazmozy) psów. Cz. I – istota choroby).

Publication: Magazyn Wet. 20, 742–746, 2011. In Polish, summary in English.

ADASZEK Ł., WINIARCZYK S.: Immunoprophylaxis of canine babesiosis. (Immunoprofilaktyka babeszjozy psów).

Publication: Magazyn Wet. 20, 262–265, 2011, In Polish, summary in English.

DEPARTMENT OF FOOD HYGIENE OF ANIMAL ORIGIN

Akademicka 12, Lublin

Head: Prof. Dr. habil. Krzysztof Szkucik
Dr. habil. Zygmunt Nowakowski

RESEARCH STUDIES (SUMMARIES)

Zbigniew Bełkot

BACTERIAL CONTAMINATION OF CHICKEN CARCASSES AS INFLUENCED BY THE TIME OF SLAUGHTER DURING THE DAY

Wpływ pory dnia ubojowego na zanieczyszczenie bakteryjne tuszek kurcząt rzeźnych

The objective of the research was to determine bacterial contamination on the surface of chicken carcasses as influenced by the order in which chickens were slaughtered during the day. The research was conducted on 75 carcasses of chickens aged 6–8 weeks, originating from a plant licensed to trade on the markets of the EU and to export to third countries. The plant complied with the HACCP system and had obtained ISO certificates related to production hygiene. The daily production of the plant amounted to 60 thousand chickens. The plant used an evaporative chilling system. Samples were collected on consecutive days of a production week. Each day, samples were collected three times: at the beginning of production (from the first 1,000 carcasses), in the middle (3,000–31,000 carcasses) and at the end (59,000–60,000 carcasses). A sample for examination consisted of skin removed from the breast and the thigh areas. Directly after chilling, 20 cm² of skin was collected by a destructive method from each carcass. The number of the following bacteria was determined per 1 cm² of skin: aerobic bacteria, psychrotrophic bacteria, bacteria from the Enterobacteriaceae family, and *Enterococcus faecalis*. The presence of Salmonella bacteria was determined in 25 g samples consisting of neck skin tissue from three carcasses. All microbiological examinations were conducted in accordance with Polskie Normy (Polish Standards). The results obtained were expressed as logarithms. The significance of differences was evaluated by Tukey's multiple range test.

The total count of aerobic bacteria amounted to 4.78 log CFU/cm² at the beginning of a slaughter cycle, 5.11 log CFU/cm² in the middle, and 5.19 log CFU/cm² at the end. The bacterial contamination of carcasses at the beginning of a slaughter day was significantly lower than contamination in the middle or at the end of the day, between which there was no significant difference. A similar pattern was observed for psychrotrophic bacteria, which numbered 4.56 CFU/cm² at the beginning of a slaughter cycle, 5.02 CFU/cm² in the middle, and 5.10 CFU/cm² at the end. The number of bacteria from the Enterobacteriaceae family amounted to 2.97 CFU/cm² at the beginning of a slaughter cycle, 3.01 CFU/cm² in the middle, and 3.16 CFU/cm² at the end. No significant differences in contamination with this group of micro-organisms were observed between the three batches of samples. There were also no significant differences in contamination with *Enterococcus faecalis*. The number of bacteria from the Enterococcus family amounted to 3.28 CFU/cm² at the beginning of a slaughter cycle, 3.33 CFU/cm² in the middle, and 3.38 CFU/cm² at the end. Salmonella bacteria were found on the skin of chickens from all three batches of samples collected during a slaughter day. They were detected in 7 samples (28%) collected at the beginning and at the end of a production day, and in 6 samples (24%) collected in the middle of the day. The predominant serotype was S. Enteritidis, but S. Virchow was also found in two samples collected at the beginning of a production day. The order in which chickens were slaughtered during a slaughter day had a significant influence on the general level of bacterial contamination and on the level of contamination with psychrotrophic bacteria. Carcasses of chickens slaughtered at the beginning of a production day were characterized by a lower general level of contamination, including contamination with psychrotrophic bacteria, compared with carcasses produced later during the day. No such pattern was observed for contamination with bacteria from the Enterobacteriaceae family and *Enterococcus faecalis*. Salmonella bacteria were detected in 27% of carcasses examined. The time of slaughter did not appear to have any significant effect on contamination with these bacteria.

Publication: Medycyna Wet. (Lublin) 67, 760–764, 2011, tab. 2. In Polish, summary in English.

Zbigniew Belkot, Renata Pyz-Lukasik

INFLUENCE OF THE AGE OF GEESE ON CHEMICAL AND ORGANOLEPTIC PROPERTIES OF FAT

Wpływ wieku gęsi na cechy chemiczne i organoleptyczne tłuszczu

The aim of the study was to describe the influence of the age of geese and type of fat on its chemical composition and selected sensory features. The research was conducted on depot and subcutaneous goose fat derived from 20

Biała Kołodzka breed goose carcasses, which were crossbred from two stocks: W11 from the maternal side and W33 from the paternal side (the so called gęś owska). The investigated fat was derived from geese of two age groups. The first group were young fowl, slaughtered at the age of 16–18 weeks, the second group of 3-4-year-old fowl, slaughtered after their reproductive period. For the examined raw fat the basic composition was described (protein content, fat, water, ash and fatty acids), features that are useful for storage (percentage of free fatty acids, acid and peroxide count) as well as the sensory quality of the fat on the basis of the intensity and desirability of the smell. It has been affirmed that the age and type of fat are essential factors leading to varied chemical compositions, fatty acid profiles and smell of goose fat. In the case of chemical composition the influence of age is most pronounced on subcutaneous fat, which in young fowl contains more protein, water and ash and less fat. The fatty acid profile is also significantly varied. Fat from older geese scores higher regarding nutritional value for both types of fat. This fat contains less saturated fats and more single and multi-unsaturated fats in comparison with fat from younger geese. At the same time, both subcutaneous and depot fat of older geese is less favorably valued by consumers with regards to sensory features.

Publication: Medycyna Wet. (Lublin) 67, 843–846, 2011, tab. 5. In Polish, summary in English.

Waldemar Paszkiewicz, Renata Pyz-Lukasik

**DEGREE OF THE REDUCTION OF BACTERIAL AIR POLLUTION
UNDER THE INFLUENCE OF UV RAYS**

Stoień redukcji zanieczyszczenia bakteryjnego powietrza pod wpływem promieni UV

Due to certain properties of ultra violet rays they are primarily used for sterilizing a surface or the air. UV rays are used, among others, to disinfect isolation wards for sterile work, laminar flow cabinets, bacteriological and virusological laboratories, operating rooms, rooms in animal houses, as well as the surfaces of tables, walls or floors. The evaluation of bacterial pollution as well as the effectiveness of methods for sterilizing the air remain relevant problems in many fields, e.g. in industry, animal production, investigative laboratories or health clinics. The aim of the study was to evaluate the degree that the level of bacterial air pollution was reduced in a cabinet for microbiological investigations, sterilized by a UV lamp with a 30 watt florescent lamp. Sampl'air Lite (AES Laboratoire Chemunex) apparatus was used to gather air from the atmosphere. Samples were sampled after 15, 30, 45, 60, 75, 90, 120, 150 and 180 minutes of sterilizing the air in the cabinet with 6 repetitions for each period of irradiation. The initial

and final level of the bacterial air pollution in the cabinet for microbiological investigations in relation to the period of the action of the UV rays as well as the level of bacterial reduction were evaluated. The minimal period of the action of the UV rays that ascertained a statistically significant and simultaneously the largest reduction of the bacterial air pollution was 180 minutes. With regards to all the remaining periods of irradiation no essential differences in the levels of bacterial reduction were noted, despite considerable (1.7–4.0 times) reductions of bacteria. An essential correlation was indicated between initial air pollution in the cabinets and 15, 45, and 60 minute periods of the action of UV rays. The correlation coefficients were 0.95 ($p \leq 0.01$), 0.82 ($p \leq 0.05$) and 0.96 ($p \leq 0.01$), respectively. In the remaining cycles of the experiment the correlations were not statistically significant, and the correlation coefficients include in the interval of 0.45–0.60. There is a need, also noted by other authors, of unifying acceptable levels of microbiological air pollution for the purposes of laboratory investigations and production processes.

Publication: Medycyna Wet. (Lublin) 67, 267–269, 2011, tab. 2. In Polish, summary in English.

Krzysztof Szkucik, Waldemar Paszkiewicz

**MORBID TRAITS AND QUALITATIVE CHANGES IN RABBITS SLAUGHTERED
IN POLAND BETWEEN 2000–2010**

Występowanie zmian chorobowych i odchyleń jakościowych w tuszkach królików rzeźnych w Polsce w latach 2000–2010

The aim of the study was to analyze the results of post mortem examinations on slaughtered rabbits conducted in the years 2000–2010 by the national Veterinary Inspection in rabbit slaughterhouses in Poland. During the studied period over 5.6 million rabbits were slaughtered. In 280,686 carcasses quality changes on account of morbidity occurred, which constitutes 4.94% of the examined carcasses. Of these carcasses 59,428 were considered unfit for consumption, i.e. 21.17%, and 1.05% of all carcasses, which were examined after slaughter. The most common diseases confirmed were parasitic invasions, primarily coccidia (65.13%). However, the most common reasons for considering carcasses as unfit for consumption were bacterial diseases (sepsis and pyemia – 34.93%) as well as coccidiosis (28.96%). The most frequent qualitative changes of rabbit carcasses were excessive thinness (2%) or insufficient bloodlessness (1.64% of the confirmed changes). All of the carcasses in which these changes have been confirmed were considered unfit for consumption. Starting from 2006 the percentage of carcasses in which post-slaughter changes were confirmed has systematically decreased, while from 2008 the same concerns carcasses unfit for consumption.

At the same time, the percentage of carcasses considered unfit for consumption from among the animals with confirmed qualitative changes after post-slaughter examination decidedly increased. This proves the good health of the rabbit population raised for slaughter in Poland, as well as its proper sanitary-veterinary control, which guarantees the high quality of the meat gained from it.

Publication: Medycyna Wet. (Lublin) 67, 690–693, 2011, fig. 2, tab. 2. In Polish, summary in English.

Krzysztof Szkucik, Ryszard Pisarski, Monika Ziomek

**INFLUENCE OF SELECTED HERBS ON THE FATTY ACID PROFILE
OF BROILER CHICKENS**

Wpływ wybranych ziół na profil kwasów tłuszczowych w tłuszczu kurcząt

The aim of the research was to investigate the influence of herbal supplementation of feed mixtures for broiler chickens on the fatty acid profile of their intramuscular and abdominal fat. The research was carried out on 210 ROSS broiler chickens, which were divided into 6 experimental groups and fed with starter, grower, and finisher feeds with 2-percent additions of a specific herb (pansy, hop, linden leaf, lemon balm, mint, or nettle). A control group was fed with feeds supplemented with flavomycin. The feed mixtures and water were given ad libitum. On the 42nd day of rearing, out of each group of chickens 4 cocks and 4 hens closest to the average body weight in their group were selected. The selected animals were slaughtered and subjected to a simplified directional analysis. The content of fatty acids in intramuscular and abdominal fat was determined with a Varian CP 3800 gas chromatograph.

The research findings suggest that the 2-percent addition of herbs had a significant effect on the fatty acid profile. In intramuscular fat the content of saturated fatty acids, including especially palmitic acid, rose significantly in all experimental groups. On the other hand, herbs were found to have no effect on the content of monounsaturated fatty acids. The influence of the herbs under examination on the content of polyunsaturated fatty acids (PUFA) was diverse. The content of these acids in intramuscular fat increased in the case of chickens fed with linden-supplemented mixture and decreased in chickens fed with feeds supplemented with mint and nettle. Abdominal fat was characterised by a lower content of saturated fatty acids, which is desirable from the dietary point of view. The amount of monounsaturated fatty acids increased in all experimental groups. The addition of hop had the greatest stimulating effect on the content of these acids. The content of polyunsaturated fatty acids, including linoleic and alpha-linoleic acids, was considerably smaller in the group fed with the hop supple-

ment. In the other experimental groups the level of these acids was comparable or higher than in the control group.

Publication: Medycyna Wet. (Lublin) 67, 198–201, 2011, tab. 2. In Polish, summary in English.

Krzysztof Szkucik, Renata Pyz-Łukasik

BACTERIAL CONTAMINATION AND SELECTED TRAITS OF RABBIT MUSCLE TISSUE SPOILAGE

The investigated material comprised rabbit carcasses obtained from a domestic slaughter (H) and two commercial slaughterhouses (L and M). The spoilage process and its dynamics was determined on the basis of bacteriological studies (total aerobic bacteria count, psychrophilic bacteria count and the presence of proteolytic bacteria), pH measurements, ammonia level as well as basic organoleptic characteristics (appearance and odor). All the determinations were performed after 24 h, 72 h and 144 h of the storage at temperature between $+2^{\circ}\text{C} \pm 1^{\circ}\text{C}$ and relative humidity ca 80%. The studies indicated the effect of hygienic status of a slaughter place on the bacterial contamination level and muscle tissue durability. Higher initial bacterial contamination of the muscle tissue from the slaughterhouse L contributed to the earlier occurrence of undesirable organoleptic deviations and higher pH and NH_3 values that evidenced a more rapid progressive spoilage process. After the 144h chill storage, the unfavorable sensory properties disqualified comestible usefulness of the carcasses and markedly limited the further cold storage life of the carcasses from the on domestic slaughter and the slaughterhouse M.

Publication: Bull. Vet. Inst. Pulawy 55, 721–724, 2011, tab. 3. In English, summary in English.

Krzysztof Szkucik, Monika Ziomek, Waldemar Paszkiewicz

MORBID TRAITS AND QUALITATIVE CHANGES IN SLAUGHTER POULTRY IN POLAND OVER 2000–2010

Występowanie zmian chorobowych i odchyleń jakościowych u drobiu rzeźnego w latach 2000–2010

The objective of the paper was to analyze the results of postmortem examination of five poultry species performed by The Veterinary Inspection during 2000–2010 in the poultry abattoirs in Poland, where nearly 6 billion of birds were slaughtered. Chicken accounted for 89,6% of total poultry slaughtered, while hens – 4,43%, turkeys – 4,27%, geese – 1,15% and ducks – 0,55%. The

recognized morbid traits and qualitative changes constituted 0,49% of all the carcasses inspected. At the same time, 0,45% of all the birds examined postmortem and 97% carcasses with identified morbid changes were declared unfit for human consumption. The most of morbid traits were observed in hens (1,89%) and turkeys (0,82%), whereas the least in ducks (0,26%) while the most common ones (76%) have proven to be the qualitative changes, primarily excessive emaciation followed by incomplete bleeding. The period of 2000–2010 was marked with a continuous increase in the chicken slaughter rates. In 2000 it averaged 342,5 million units, whereas 658,6 million units in 2010. A percentage of the identified morbid changes ranged from 0,36% up to 0,46%. There was determined a regular decline in the percentage of carcasses considered not fit for consumption in a group of all the chickens inspected, i.e. from 0,44% in 2000 to 0,36% in 2010. It is good evidence that the health status of the poultry stock in Poland is good, sanitary and veterinary inspection appropriate and that overall guarantees high quality meat obtained.

Publication: Życie Wet. 86, 988–991, 2011, fig. 2, tab. 4. In Polish, summary in English.

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SZKUCIK K., ZIOMEK M., MAĆKOWIAK-DRYKA M., PASZKIEWICZ W.: Edible snails – their utility, nutrition value and food safety for consumers. (Ślimaki jadalne – użytkowość, wartość odżywcza i bezpieczeństwo dla zdrowia konsumenta).

Publication: Życie Wet. 86, 631–635, 2011. In Polish, summary in English.

DEPARTMENT OF PATHOLOGICAL ANATOMY

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RESEARCH STUDIES (SUMMARIES)

Wojciech Łopuszyński, Łukasz Adaszek, Stanisław Winiarczyk

CLINICAL COURSE AND DIAGNOSIS OF CEREBROCORTICAL NECROSIS IN YOUNG BULLS

Przebieg i rozpoznanie martwicy kory mózgowej młodego bydła opasowego

Cerebrocortical necrosis is a disease with a secondary deficiency of vitamin B1. Among the ruminant the disease most often occurs in young bulls between 5–18 months of age, fed of carbohydratesrich feed. Clinical symptoms observed in the course of this disease include blindness, ataxia and sensory disturbances. The diagnosis of cerebrocortical necrosis is established on the results of clinical examination, laboratory tests (concentration of thiamine), the effectiveness of treatment, and in cases of deaths on the basis on necropsy and histopathological examination of the brain. Treatment involves supplementation of vitamin B1. This paper presents the cases of cerebrocortical necrosis in 4 bulls at the age of 5–8 months.

Publication: Med. Wet. (Lublin) 67, 186–189, 2011, fig. 3, tab. 1. In Polish, summary in English.

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LISTOS P., NOZDRYN-PLOTNICKI Z.: Acute torsio ventriculi as the most popular reason of death of the dogs works for the law organs. (Ostry skręt żołądka jako najczęstsza przyczyna śmierci psów służbowych). Ref. VIIIth Scientific Festival in Lublin. Lublin 17–23 IX 2011. *Publication: Proceedings of the VIIIth Scientific Festival in Lublin, UP 069, 2011. In Polish.*

PIÓRKOWSKI J.: Estimation of pathomorphological changes in animals. (Ocena zmian patomorfologicznych w tkankach zwierzęcych). Ref. VIIIth Scientific Festival in Lublin. Lublin, 17–23 IX 2011. *Publication: Proceedings of the VIIIth Scientific Festival in Lublin, UP 062, 2011. In Polish.*

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LISTOS P.: Job responsibility in the veterinary profession. Assistant veterinary staff practice of the law typical veterinary doctor practice. (Odpowiedzialność zawodowa lekarza. Wykonywanie przez technika weterynarii czynności przewidzianych prawnie dla lekarza weterynarii). *Publication: Weterynaria w praktyce 8, 1–2, 76–77, 2011. In Polish.*

LISTOS P.: Job responsibility in the veterinary profession. Veterinary practice in the non evidenced medicinal works. (Odpowiedzialność zawodowa lekarzy weterynarii. Świadczenie przez lekarza weterynarii usług weterynaryjnych w zakładzie leczniczym, bez uzyskania wpisu do ewidencji zakładów leczniczych dla zwierząt we właściwej okręgowej izbie lekarsko-weterynaryjnej). *Publication: Wetererynaria w praktyce 8, 3, 88–90, 2011. In Polish.*

LISTOS P.: Job responsibility in the veterinary profession. Incorrect evidence of hospitalized animals and veterinary documentation. (Odpowiedzialność zawodowa lekarza. Nieprawidłowe prowadzenie ewidencji leczenia zwierząt i dokumentacji lekarsko-weterynaryjnej). *Publication: Weterynaria w praktyce 8, 4, 76–78, 2011. In Polish.*

LISTOS P.: Job responsibility in the veterinary profession. Veterinary doctor as a court expert in the job responsibility in the veterinary profession. (Odpowiedzialność zawodowa lekarza. Lekarz jako biegły w postępowaniu dotyczącym odpowiedzialności zawodowej). *Publication: Weterynaria w praktyce 8, 5, 84–86, 2011. In Polish.*

LISTOS P.: Job responsibility in the veterinary profession. Rights and duties of the veterinary court expert. (Odpowiedzialność zawodowa lekarzy weterynarii. Prawa i obowiązki biegłego lekarza weterynarii).

Publication: Weterynaria w praktyce 8, 6, 83–85, 2011. In Polish.

LISTOS P.: Job responsibility in the veterinary profession. Role of the insurance company in the job responsibility in the veterinary profession. (Odpowiedzialność zawodowa lekarzy weterynarii. Rola firmy ubezpieczeniowej w postępowaniu dotyczącym odpowiedzialności zawodowej).

Publication: Weterynaria w praktyce 8, 10, 92–93, 2011. In Polish.

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SUB-DEPARTMENT OF PATHOPHYSIOLOGY

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Dr. habil. Urszula Kosior-Korzecka

RESEARCH STUDIES (SUMMARIES)

Ryszard Bobowiec, Marta Kierska, Urszula Kosior-Korzecka

INSULIN SENSITIVITY IN HIGH-PRODUCING LACTATING COWS

The aim of the studies was to compare lean and obese high-producing milk Holstein-Friesian cows in terms of their insulin sensitivity. 17 animals, 2-8 years of age, weighing 480–725 kg, with a daily milk yield fluctuating between 25.4 and 46.5 kg, were divided into two groups, depending on the body weight and condition: lean and obese cows. Subsequently, both groups were divided into subgroups according to the month of lactation. Their condition was evaluated on a five-point Body Condition Score (BCS) scale. Throughout the entire experiment, the cows were fed ad libitum with the same feed and had free access to fresh water. Blood samples were collected every week directly after milking from the subcutaneous abdominal vein. In the whole blood the glucose level was measured, whereas in the plasma, insulin and FFA concentrations were analysed. On the basis of the results obtained, insulin sensitivity was analysed according to the RQUICKI formula (Revised Quantitative Insulin Sensitivity Check Index),

and the energy balance was calculated. In both experimental groups of lactating cows, the plasma insulin level was found to be several times higher than the physiological norm for non-lactating animals. The highest insulin concentration was noted in obese cows with BCS 3.5. Moreover, in the obese group a high negative correlation ($r = -0.62$) between insulin sensitivity and BCS, and a positive correlation between the insulin level and BCS were found. The level of free fatty acids (FFA) increased during the lactation, and in both groups it was higher than the reference data. The highest FFA concentration, similarly to insulin, was found in obese cows with BCS 3.5. The glucose level increased during the lactation in both groups of animals, but it was lower than the physiological norm for non-lactating cows. According to our results, there is a relationship between the insulin concentration, insulin sensitivity, and body condition (BCS) in high-producing milk cows. In high-yielding dairy cows elevated levels of FFA may indicate that insulin sensitivity is suppressed. The fat high-producing cows maintained on a positive energy balance are more likely to develop insulin resistance and succumb to production diseases. The RQUICKI test enables an easy assessment of tissue response to insulin.

Publication: Medycyna Wet. (Lublin) 67, 181–185, 2011, fig. 5. In English, summary in English.

Marta Wójcik, Ryszard Bobowiec

EFFECT OF DEXAMETHASONE ON PROLIFERATION OF RAT HEPATOCYTES AND RELEASE OF BILE ACIDS IN VITRO

The influence of dexamethasone (DEX) on proliferative activity and bile salt concentration in primary culture of rat hepatocytes were investigated. Isolated liver cells were cultured with 10^{-3} M of cholesterol, and with 10^{-3} M of cholesterol and addition of 10^{-6} , 10^{-8} , or 10^{-10} M of DEX. After 24, 48, and 72 h, the cell proliferation, bile salt concentration, and profile were examined. The proliferative activity of control hepatocytes ranged between 0.841 0.05 and 0.937 0.007. In opposite to 10^{-8} M DEX, the addition of 10^{-6} and 10^{-10} M of DEX resulted in a decrease in proliferative activity of cells after 48 h of incubation (0.5190.12 and 0.5330.13, respectively). The presence of DEX resulted in elevation of bile salt level in samples obtained after 72 h (3.971.2 $\mu\text{M/L}$; 3.422.0 $\mu\text{M/L}$, and 3.520.3 $\mu\text{M/L}$ in the presence of 10^{-6} M, 10^{-8} M, and 10^{-10} M of DEX, respectively). Proliferative response of rat hepatocytes to DEX depended on dose and incubation time. DEX in the highest concentration intensified the bile salts synthesis much earlier than under other experimental conditions. Among the

analysed bile salts, cholic and deoxycholic acids predominated. They were conjugated mostly with taurine and to a lesser extent with glycine.

Publication: Bull. Vet. Inst. Pulawy 55, 327–331, 2011, fig. 4, tab. 1. In English, summary in English.

Marta Wójcik, Pierluigi Ramadori, Martina Blaschke, Sadaf Sultan,
Sajjad Khan, Ihtzaz A. Malik, Naila Naz, Gesa Martius, Giuliano Ramadori,
Frank C. Schultze

**IMMUNODETECTION OF CYCLOOXYGENASE-2 (COX-2) IS RESTRICTED TO TISSUE
MACROPHAGES IN NORMAL RAT LIVER AND TO RECRUITED MONONUCLEAR
PHAGOCYTES IN LIVER INJURY AND CHOLANGIOCARCINOMA**

It has been suggested that cyclooxygenase-2 (COX-2)-mediated prostaglandin synthesis is associated with liver inflammation and carcinogenesis. The aim of this study is to identify the cellular source of COX-2 expression in different stages, from acute liver injury through liver fibrosis to cholangiocarcinoma (CC). We induced in rats acute and “chronic” liver injury (thioacetamide (TAA) or carbon tetrachloride (CCl₄) and CC development (TAA) and assessed COX-2 gene expression in normal and damaged liver tissue by RT-PCR of total RNA. The cellular localization of COX-2 protein in liver tissue was analyzed by immunohistochemistry as well as in isolated rat liver cells by Western blotting. The findings were compared with those obtained in human cirrhotic liver tissue. The specificity of the antibodies was tested by 2-DE Western blot and mass spectrometric identification of the positive protein spots. RT-PCR analysis of total RNA revealed an increase of hepatic COX-2 gene expression in acutely as well as “chronically” damaged liver. COX-2-protein was detected in those ED1 + /ED2 + cells located in the non-damaged tissue (resident tissue macrophages). In addition COX-2 positivity in inflammatory mononuclear phagocytes (ED1 + /ED2 –), which were also present within the tumoral tissue was detected. COX-2 protein was clearly detectable in isolated Kupffer cells as well as (at lower level) in isolated “inflammatory” macrophages. Similar results were obtained in human cirrhotic liver. COX-2 protein is constitutively detectable in liver tissue macrophages. Inflammatory mononuclear phagocytes contribute to the increase of COX-2 gene expression in acute and chronic liver damage induced by different toxins and in the CC microenvironment.

Publication: Histochem. Cell Biol. 2011 (published on line), fig. 9, tab. 3. In English, summary in English.

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Ref.: XXV Congress of the Polish Physiological Society, Olsztyn, 15–17 IX 2011.

Publication: *J. Phys. Pharm. suppl.1*, 62, 189, 2011. In English

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Publication: *J. Phys. Pharm., suppl. 1*, 62, 192, 2011. In English.

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Publication: *Materials of the the XLI Meeting of Polish Physicists in Lublin*, 213, 2011. In English.

STĘPIEŃ M.: The influence of ketogenic diet on the level of esters of free fatty acids in liver tissue of rats. (Wpływ diety ketogennej na poziom estrów wolnych kwasów tłuszczowych w tkance wątroby szczurów).

Ref.: XV International Conference Students Scientific Circle (Section of Veterinary), Olsztyn 6–8 V 2011.

Publication: *Proceedings of the XV International Conference Student Scientific Circle (Section of Veterinary)*, 150, 2011. In Polish.

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Ref.: XV International Conference Students Scientific Circle (Section of Veterinary), Olsztyn 6–8 V 2011.

Publication: *Proceedings of the XV International Conference Student Scientific Circle (Section of Veterinary)*, 152, 2011. In Polish.

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Publication: *J. Phys. Pharm., suppl. 1*, 62, 199, 2011. In English.

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Publication: *J. Phys. Pharm., suppl. 1*, 62, 201, 2011. In English.

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Publication: *Lecznica Dużych Zwierząt*, 6, 2, 15–25, 2011. In Polish.

WESSELY-SZPONDER J., BOBOWIEC R.: Proteins and peptides of neutrophils in the animal and people therapy. (Neutrofilowe obronne białka i peptydy w leczeniu zwierząt i ludzi).

Publication: *Życie Wet.*, 86, 276–281, 2011. In Polish, summary in English.

SUB-DEPARTMENT OF PHARMACOLOGY

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RESEARCH STUDIES (SUMMARIES)

Artur Burmańczyk, Zbigniew Roliński, Cezary Kowalski, Rafał Zań

CONCENTRATION OF CEFACETRIL IN MILK AFTER ITS INTRAMAMMARY ADMINISTRATION TO COWS WITH HEALTHY AND INFLAMMED MAMMARY GLAND

The aim of the study was to develop a sensitive analytical method that enables to determine cefacetril concentration in milk after its application to the udders, as well as to establish and compare cefacetril's basic pharmacokinetic indicators after its intramammary application to cows with inflamed and healthy udders. The content of cefacetril was determined with the use of high-performance liquid chromatography with UV detection. Usefulness of the developed analytical method in the studies of pharmacokinetics of cefacetril has been demonstrated. Results obtained during the statistical analysis and bacteriological examinations allowed to regard the antibiotic as an accurately selected medical product used in the treatment of mastitis in cows.

Publication: Bull. Vet. Inst. Pulawy 55, 685–688, 2011, fig.1, tab. 2. In English, summary in English.

Dorota Krasucka, Cezary Kowalski, Monika Osypiuk

DETERMINATION OF AMOXICILLIN IN PIG PLASMA BY LIQUID CHROMATOGRAPHY WITH FLUORESCENCE DETECTION

The concentrations of amoxicillin in pig plasma were determined by HPLC technique. Separation was achieved on a Lichrocart 250 × 4 mm Purospher column and detection was performed with a fluorescence detector. The mobile phase consisted of a mixture of acetonitrile with buffer solution (0.05 M KH₂PO₄, pH 5.6) delivered by a isocratic programme. For amoxicillin assay, the

plasma samples were exposed to reaction with formaldehyde under acidic and heating conditions. The limit of detection and quantification, as well as the accuracy and precision of the method were evaluated from spiked plasma samples at concentration levels ranging from 10 to 500 ngmL⁻¹. Recovery of spiked amoxicillin was > 91%, with coefficient of variation equals 0.12%. This method offers a rapid, repeatable, and accurate procedure and has been useful for determination of pharmacokinetic parameters of amoxicillin in pigs' and poultry plasma.

Publication: Bull. Vet. Inst. Pulawy 55, 771–775, 2011, fig.3, tab.1. In English, summary in English.

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Ref.: Science and Training Conference „New directions in veterinary pharmacology and toxicology research”. Kościelisko–Zakopane, 8–11 XII 2011.

Publication: Proceedings of the Science and Training Conference “New directions in veterinary pharmacology and toxicology research”, 8, 2011. In Polish.

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Ref.: Science and Training Conference „New directions in veterinary pharmacology and toxicology research”. Kościelisko–Zakopane, 8–11 XII 2011.

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Ref.: The XVII FECAVA Eurocongress, VI Tsava Congress “Modern Veterinary Practices”. Istanbul, 7–10 IX 2011.

Publication: Supplement of the XVII FECAVA Eurocongress, VI Tsava Congress “Modern Veterinary Practices”, 2011. In English.

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Publication: Proceedings of the International Scientific Conference (Veterinary Clinic of domestic animals) 48–50, 2011. In Polish.

ŁASIECKA K., ŁEBKOWSKA-WIERUSZEWSKA B., KOWALSKI C.J.: The use of antioxidants in treatment of liver diseases. (Stosowanie antyoksydantów w terapii chorób wątroby).

Ref.: Science and Training Conference „New directions in veterinary pharmacology and toxicology research”. Kościelisko–Zakopane, 8–11 XII 2011.

Publication: Proceedings of the Science and Training Conference “New directions in veterinary pharmacology and toxicology research”, 19, 2011. In Polish.

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Ref.: Science and Training Conference „New directions in veterinary pharmacology and toxicology research”. Kościelisko–Zakopane, 8–11 XII 2011.

Publication: Proceedings of the Science and Training Conference “New directions in veterinary pharmacology and toxicology research”, 20, 2011. In Polish.

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SUB-DEPARTMENT OF VETERINARY TOXYCOLOGY AND ENVIRONMENT PROTECTION

Akademicka 12, Lublin

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RESEARCH STUDIES (SUMMARIES)

Anna Stachurska, Grażyna Wałkuska, Marzena Cerbera, Zbigniew Jaworski,
Agnieszka Chałabis-Mazurek

HEAVY METAL STATUS OF POLISH KONIK HORSES FROM STABLE-PASTURE AND OUTDOOR MAINTENANCE SYSTEMS IN THE MASURIAN ENVIRONMENT

Among domestic animals, cattle and horses kept on pasture and fed with hay and straw are exposed most prominently to environmental pollution. Determination of the status of heavy metals in bodies of horses is important for two reasons. Firstly, it helps to assess the level of environmental contamination. Secondly, heavy metals can have considerable influence on animals living outdoors. The aim of the study has been to verify whether the level of Cr, Mn, Cu, Cd, Pb and Ni in the coat hair and cornified structures of hooves may differ between horses maintained alternately in a stable and on pasture and living outdoors all year long, with Polish Koniks from Mazury (the Masurian Lake District) taken as an example. Possible effects of the feeding season and age of horses were considered. In total, 35 Polish Konik horses were examined, either kept in a stable-pasture system in Popielno or outdoors in Wojnowo. Sixty-two samples of summer and winter coat hair, 28 samples of hoof horn, as well as 10 samples of pasture plants and water were analyzed. The data were elaborated with the use multi-factor analysis of variance, T-Tukey-Kramer test and Pearson' correlation.

The results show that Polish Konik horses bred in Mazury have a low heavy metal concentration in the coat hair and hoof horn. The stable-pasture and outdoor maintenance systems hardly differentiate the element content, whereas the winter feeding results in an elevated concentration of the elements in the hair. Yearlings show higher Mn and Cd content than mares and foals at foot. The dam's impact on the heavy metal concentration in the hair and hoof horn in their foals is usually non-significant.

Publication: J. Elem. 16, 623–633, 2011, fig. 5, tab. 2. In English, summary in English.

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