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Project of cover
Barbara Jarosik

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, Poland, 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 2010

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. extraordin. Dr. habil. Cezary Kowalski
Prof. extraordin. Dr. habil. Piotr Silmanowicz

Professors

Prof. Dr. habil. Marcin Arciszewski

Prof. Dr. habil. Ireneusz Balicki

Prof. ordin. Dr. habil. Ryszard Bobowiec

Prof. Dr. habil. Zbigniew Boratyński

Prof. ordin. Dr. habil. Zbigniew Grądzki

Prof. Dr. habil. Jadwiga Jaworska-Adamu

Prof. extraordin. Dr. habil. Marta Kankofer

Prof. ordin. Dr. habil. Krzysztof Kostro

Prof. ordin. Dr. habil. Cezary Kowalski

Prof. extraordin. Dr. habil. Leszek Krakowski

Prof. extraordin. Dr. habil. Zbigniew Nozdryn-Płotnicki

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Prof. extraordin. Dr. habil. Antonina Sopińska
Prof. Dr. habil. Krzysztof Szkucik
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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
Dr. habil. Krzysztof Lutnicki
Dr. habil. Wojciech Łopuszynski
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: 82

Technicians: 53

Received the degree of Doctor of Veterinary Science: 2

Received the degree of Doctor habil.: 0

Students: 1065

Received the diploma of veterinary surgeon: 157

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	3885 hours
Optional subject	150 hours
Clinical practices	315 hours
<hr/>	
Total	4350 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 2010)

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

OTHER PUBLICATIONS

GUZ L.: Infectious hematopoietic necrosis in salmonid fish. (Zakaźna martwica układu krwiotwórczego ryb łososiowatych), in: Notifiable diseases of fish and other dangerous diseases in aquaculture – diagnosis, prophylactic and therapy. (Choroby ryb podlegające obowiązkowi zwalczania oraz inne choroby zagrażające hodowli – diagnostyka, profilaktyka, terapia), edited by Wojciech Szweda, Andrzej K. Siwicki, Elżbieta Terech-Majewska.

Publication: Wydawnictwo IRS, Olsztyn, 55–77, 2010. In Polish.

SUB-DEPARTMENT OF PARASITOLOGY AND INVASIVE DISEASES

Akademicka 12, Lublin

Head: Dr. Krzysztof Tomczuk

RESEARCH STUDIES (SUMMARIES)

Klaudiusz Szczepaniak, Andrzej Bernard Sadzikowski

KALICEPHALUS INVASION IN SNAKES FROM AMATOUR BREEDINGS

Inwazja nicieni z rodzaju *Kalicephalus* u węży z hodowli amatorskich

The aim of the present study was to describe and analyze prevalence, intensity, life cycle, pathogenesis and clinical symptoms of *Kalicephalus* nematode invasion in captive snakes. Nematode infections were diagnosed during necropsy (21 snakes) and faeces examination (51 snakes). Average prevalence of *Kalicephalus* species in investigated snakes was 19,4%, ranging from very high invasion intensity (157 nematodes) to very low (3 nematodes), with the average score of 51,1.

Publication: Weterynaria w praktyce, 9, 66–70, 2010, fig. 10, tab. 2. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

DEMKOWSKA-KUTRZĘPA M., TOMCZUK K., STUDZIŃSKA M.B., WITKOWSKA A.: Anthelmintic resistance in Ancylostomatidae – laboratory study. (Lekooporność nicieni z rodziny Ancylostomatidae – badania laboratoryjne).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: Proceedings of the XXII Congress of the Polish Parasitological Society, 139, 2010. In Polish.

STUDZIŃSKA M.B., JAKUBIK L.: Parasites invasions of birds from smallholding. (Parazytofauna ptaków z gospodarstw indywidualnych).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: Proceedings of the XXII Congress of the Polish Parasitological Society, 138, 2010. In Polish.

STUDZIŃSKA M.B., SZCZEPANIAK K., TOMCZUK K.: Endoparasites of the hares from different forming systems with preliminary parasitological study of environment. (Pasożyty wewnętrzne zajęcy pochodzących z różnych systemów utrzymani. Próba parazytologicznej oceny gleby z kwaterowej hodowli zajęcia).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: *Proceedings of the XXII Congress of the Polish Parasitological Society*, 169, 2010. In Polish.

SZCZEPANIAK K., DĘBIAK P.: Coccidia of lizards classified into genus *Choleoeimeria*. (Inwazja kokcydiów z rodzaju *Choleoeimeria* u jaszczurek).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: *Proceedings of the XXII Congress of the Polish Parasitological Society*, 169, 2010. In Polish.

SZCZEPANIAK K., TOMCZUK K., JUNKUSZEW A., CHAŁABIS-MAZUREK A.: Parasitological investigation of sheep from open pastures forming systems. (Badanie parazytologiczne owiec z hodowli pastwiskowych).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: *Proceedings of the XXII Congress of the Polish Parasitological Society*, 15, 2010. In Polish.

TOMCZUK K., ŻELECHOWSKA M.: Protozoons invasions of *Eimeria* genus in calves from different types of farms of Lubelszczyzna region. (Inwazje pierwotniaków z rodzaju *Eimeria* u cieląt w różnych w różnych typach gospodarstw z terenu Lubelszczyzny).

Ref.: XXII Congress of the Polish Parasitological Society, Puławy, 1–3 IX 2010.

Publication: *Proceedings of the XXII Congress of the Polish Parasitological Society*, 114, 2010. In Polish.

OTHER PUBLICATIONS

MICHALSKI M.M., TOMCZUK K.: Flies. Threats and opportunities to protect animals. (Muchy i meszki. Zagrożenia i możliwości ochrony zwierząt).

Publication: *Weterynaria w terenie* 3, 62–69, 2010. In Polish.

STUDZIŃSKA M.B.: Are dogs and cats ticks dangerous for humans? (Czy kleszcze, które bytują na psach i kotach mogą stanowić zagrożenie dla człowieka?).

Publication: *Cztery łapy* 7, 12, 2010. In Polish.

SZCZEPANIAK K.O., ŁOJSZCZYK-SZCZEPANIAK A., SADZIKOWSKI A.B.: Co-infection of *Isoospora amphiboluri* and pinworms in bearded dragon with ileus (Koinwazja *Isoospora amphiboluri* i owsików u agamy brodatej z niedrożnością jelita).

Publication: *Weterynaria w praktyce*, 5, 76-79, 2010, fig. 5, tab. 1. In Polish, summary in English.

TOMCZUK K.: Andrzej Bernard Sadzikowski 1952–2010.

Publication: *Aktualności UP (Lublin)* 14, 19, 2010. In Polish.

TOMCZUK K.: *Diptera* invasions. (Inwazje muchówek).

Publication: *Gazeta Jastkowska* 2, 31–32, 2010. In Polish.

TOMCZUK K.: Myiasis and flies invasions. Prevention and treatment. (Inwazje much i ich zwalczanie).

Publication: Gazeta Jastkowska 3, 38–40, 2010. In Polish.

TOMCZUK K.: Pigeons – passion and risk. (Gołębie – pasje i zagrożenia).

Publication: Gazeta Jastkowska 4, 23–24, 2010. In Polish.

TOMCZUK K.: Dangerous pulmonary nematodosis. (Groźna robaczycza płuc).

Publication: Top Agrar Pol. 10, 30–31, 2010. In Polish.

SUB-DEPARTMENT OF POULTRY DISEASES

Akademicka 12, Lublin

Head: vacant

RESEARCH STUDIES (SUMMARIES)

Dagmara Stepień-Pyśniak

OCCURRENCE OF GRAM-NEGATIVE BACTERIA IN HENS' EGGS DEPENDING ON THEIR SOURCE AND STORAGE CONDITIONS

The aim of this study was to analyse the qualitative composition of Gram-negative microbes, mainly of the family *Enterobacteriaceae*, including pathogenic bacteria such as *Salmonella*, in the albumens and yolks and on the shells of hens' eggs, depending on their source and on the temperature and duration of their storage. A total of 375 table eggs were studied, from a large-scale poultry farm, a small-scale poultry farm and a supermarket. Each group was divided into 5 subgroups according to the temperature and duration of their storage during the study. Two serotypes of bacteria of the genus *Salmonella* were identified: *S. Enteritidis* and *S. Arizonae*. Strains of *Salmonella* spp. were also isolated. Apart from *Salmonella* and *Escherichia coli*, among the most frequently isolated bacteria of the family *Enterobacteriaceae* were *Enterobacter* spp., *Klebsiella* spp. and *Citrobacter freundii*. Qualitative analysis of the bacterial microflora of the eggs also showed the presence of other Gram-negative bacteria, including *Acinetobacter* spp., *Pseudomonas* spp., *Tatumella ptyseos*, *Providencia stuartii*, *Serratia liquefaciens*, *Flavimonas oryzihabitans*, *Vibrio metschnikovii*, *Leclercia adecarboxylata*, *Kluyvera* spp., *Rahnella aquatilis*, *Proteus mirabilis*, and *Achromobacter* spp. The study demonstrated that the conditions applied, i.e. the temperature and duration of storage, did not significantly influence the prevalence of particular species of Gram-negative bacteria in the eggs. However, based on the analysis of contamination of eggs with *Salmonella* depending their source, it can be concluded that the system in which the hens are housed affects the risk of contamination of eggs with these pathogens.

Publication: Pol. J. Vet. Sci., 13, 507–513, 2010. In English, summary in English

REPORTS TO RESEARCH MEETINGS

MAREK A., DUDZIC A., STĘPIEŃ-PYŚNIAK D., PYZIK E.: Bacterial microflora isolated from fertile eggs, dead embryos or neonatal chicks and their influence on poultry breeding. (Mikroflora bakteryjna izolowana z zapłodnionych jaj kurzych, zmarłych zarodków i od nowo wyklutych piskląt oraz jej znaczenie w patologii drobiu).

Ref.: Conference "Current problems in the pathology of disease with particular emphasis on embryopathology and pre- and post-hatching period", Wrocław, 2–3 VII 2010.

Publication: Monograph: Current problems in the pathology of disease with particular emphasis on embryopathology and pre- and post-hatching period, 119–130, Wrocław 2010. In Polish.

PYZIK E., STĘPIEŃ-PYŚNIAK D., MAREK A.: Staphylococci isolated from hatching eggs. (Mikroflora bakteryjna z rodzaju Staphylococcus izolowana z jaj kurzych wylęgowych).

Ref.: Conference "Current problems in the pathology of disease with particular emphasis on embryopathology and pre- and post-hatching period", Wrocław, 2–3 VII 2010.

Publication: Monograph: Current problems in the pathology of disease with particular emphasis on embryopathology and pre- and post-hatching period, 130–137, Wrocław 2010. In Polish.

OTHER PUBLICATIONS

MAREK A., STĘPIEŃ-PYŚNIAK D.: Parasitosis of the upper respiratory tract – syngamosis of poultry. (Parazytoza górnego odcinka układu oddechowego – syngamoza drobiu).

Publication: Magazyn Wet., suppl. Avian diseases, 414–418, 2010. 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)

Grażyna Ziółkowska, Stanisław Tokarzewski, Aneta Nowakiewicz

ASPERGILLUS GENUS – SPECIES DIVERSIFYING BUT THE SENSITIVITY TO ANTIFUNGAL PREPARATIONS

Grzyby z rodzaju *Aspergillus* – różnicowanie gatunkowe a wrażliwość na preparaty antygrzybicze

Aspergillosis is included in most often appearing mycotic infections of the respiratory system of birds. All species of poultry, ornamental bird and wild can be ill – particularly birds of prey kept in the captivity. Establishing the sensitivity of various species of the *Aspergillus* genus get from the poultry flocks to readily available drugs, as well as the attempt to determine their profiles of the resistance. Examinations included fungal isolates from the *Aspergillus* genus get from hens, turkeys, geese and ducks with clinical symptoms of aspergillosis about the diversified intensity. *Aspergillus* species sensitivity to antifungal drugs were determinate with Sabouraud glucose agar with disc diffusion method in the own modification. We demonstrated, that irrespective of fungus species, the *Aspergillus* genus is marked by a high sensitivity on enilconazole and terbinafine and with resistance on 5-fluorocytosine, fluconazole, itraconazole and amphotericin B. Antifungal activity of remaining drugs i.e. ketoconazole, miconazole, clotrimazole, pimaricin and tioconazole are diversified and seem to depend on the *Aspergillus* species. An *in vitro* high antifungal drug resistance is characterizing *Aspergillus* species isolated from birds which the level seems to depend to some extent on species of the fungus.

Publication: Mikologia Lekarska 17, 97–102, 2010, fig. 5, tab. 4. In Polish, summary in English.

Barbara Majer-Dziedzic, Krzysztof Szkucik

**SEROLOGICAL EVALUATION OF ANTIBODY TITRES
TO RABBIT HAEMORRHAGIC DISEASE**

Serologiczna ocena poziomu przeciwciał przeciwko wirusowi krwotocznej choroby królików

The research was aimed at determining the level of hemagglutination-inhibiting (HI) antibodies in the serum of slaughter rabbits. The research material consisted of 201 serum samples collected from slathered rabbits of 20 weeks of age and body weight from 4.5 to 5 kg. The rabbits originated from small farms (167 cross-breeds) and a battery farm (34 French Lops) located in south-eastern Poland. The animals from the battery farm had been vaccinated with "Cunivac", whereas those bred on small farms had not been vaccinated at all. The sera collected from the animals were examined with the hemagglutination-inhibiting test for the presence of antibodies to rabbit haemorrhagic disease (RHD). The results obtained showed that only 5% of the animals reacted negatively, while the remaining 95% showed positive titres. In the group of vaccinated rabbits, no antibodies were found in three animals. Titres ranging from 100 to 800 were noted in 21 sera, while 9 animals reacted with titres of 1000 or more. Out of the 201 sera examined, 167 came from non-vaccinated rabbits originating from regions free of RHD. Positive titres of HI antibodies were not found in 7 samples. On the other hand, 80.2% of the animals were characterised by positive titres of 100 or more. In a similar research conducted in 1992 as much 68.4% of 215 sera tested were found negative for these antibodies. The results of the present research showed a very high percentage of sera with positive titres in non-vaccinated animals, which were free from the disease. This might suggest that non-pathogenic strains (RCV) related to the RHD virus exist also in Poland. It appears that such strains might have a similar effect as a vaccine, immunising the infected animals, which show no symptoms of the disease.

Publication: Medycyna Wet. (Lublin) 66, 206–209, 2010, tab. 3. In Polish, summary in English.

OTHER PUBLICATIONS

ZIÓLKOWSKA G., TOKARZEWSKI S., NOWAKIEWICZ A. Antifungals and their use in the treatment of fungal infections in birds. (Leki przeciwgrzybicze i ich zastosowanie w terapii infekcji grzybiczych u ptaków).

Publication: Magazyn Wet., suppl. Avian Diseases, 457–462, 2010. In Polish, 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)

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

CHARACTERISATION OF OUTER MEMBRANE PROTEINS PARTICIPATING IN IRON TRANSPORT IN *Pasteurella multocida* SEROTYPE 3

Iron-regulated outer membrane proteins (IROMPs) of *P. multocida* serotype A3, which function as receptors for complexes containing iron ions, are induced by iron deficiency in the bacterial growth environment. Analysis of an electrophoresis image of proteins isolated from bacteria grown on medium supplemented with 2,2'-dipyridyl revealed expression of 16 new proteins that were not noted in the case of the bacteria grown in standard conditions, with molecular weights from 30 to 160 kDa. Induction of IROMP expression occurred within 30 minutes after restricted iron conditions were established. In immunoblotting, distinct reactions were noted for proteins of molecular weight ranges of 25–49 kDa, 61–95 kDa, and 108–214 kDa. Proteins of the molecular weight of 68, 75 and 86 kDa were analysed using mass spectrometry and matched with the highest probability to proteins in the NCBI data base. Several dozen different proteins with similar amino acid sequences were matched to each sample.

Publication: Pol. J. Vet. Sci. 13, 121–127, 2010, fig.4, tab. 3. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

BARBU N., GROOMS D., MAES R., PASSMORE C., URBAN-CHMIEL R.: Detection of bovine respiratory syncytial virus using commercial human respiratory syncytial virus rapid immunomigration assays.

Ref.: XXXXIII Annual AABP Conference in Albuquerque NM, 19–22 VIII 2010.

Publication: Proceedings of the XXXXIII Annual AABP Conference in Albuquerque NM, 192, 2010, In English, edition on-line:

<http://www.aabp.org/members/publications/2010/proceedings/ResSum3.pdf>

URBAN-CHMIEL R., GROOMS D L., BARBU N.: Rapid identification of bovine respiratory syncytial virus BRSV in Poland and Michigan State (Szybka identyfikacja bydłowego wirusa syncytialnego BRSV w Polsce i stanie Michigan).

Ref.: Conference about “Modern methods in prophylaxis and therapy of chosen diseases in cattle”, Puławy 24–25 IV 2010.

Publication: Lecznica Dużych Zwierząt Journal, 2, 25–27, 2010, In Polish.

URBAN-CHMIEL R., WERNICKI A.: The risk factors in bovine respiratory disease complex (Czynniki ryzyka w zespole oddechowym u bydła).

Ref.: VI Conference about “Newborn and environment”, Wrocław 10–11 XII 2010.

Publication: Proceedens of the VI Conference Newborn and environment 6, 214–225, 2010, In Polish.

DEPARTMENT OF ANATOMY AND ANIMAL HISTOLOGY

Akademicka 12, Lublin

Head: Prof. Dr. habil. Zbigniew Boratyński

SUB-DEPARTMENT OF ANIMAL ANATOMY

Akademicka 12, Lublin

Head: Prof. Dr. habil. Zbigniew Boratyński
Prof. Dr. habil. Marcin Arciszewski
Dr. habil. Izabela Krakowska

RESEARCH STUDIES (SUMMARIES)

Not published in 2010.

SUB-DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

Akademicka 12, Lublin

Head: Prof. Dr. habil. Jadwiga Jaworska-Adamu

RESEARCH STUDIES (SUMMARIES)

Mirosława Dmowska, Regina Cybulska, Ryszard Schoenborn, Tomasz Piersiak,
Jadwiga Jaworska-Adamu, Antoni Gawron

BEHAVIOURAL AND HISTOLOGICAL EFFECTS OF PRECONDITIONING WITH LIPOPOLYSACCHARIDE IN EPILEPTIC RATS

Sublethal stress stimuli such as systemic endotoxin treatment can induce tolerance of the brain to subsequent ischemic stress, which results in a decreased infarct size. Based on this evidence, we hypothesized that lipopolysaccharide (LPS)-induced preconditioning could protect hippocampal neurons in epileptic rats. To test this hypothesis, the anticonvulsant effect of a low dose of LPS against seizures elicited by pilocarpine hydrochloride was measured. Using the pilocarpine model of temporal lobe epilepsy and LPS-preconditioning, we also investigated hippocampal pathology in the rat brain. Based on the behavioural observations conducted, it can be assumed that the preconditioning procedure used may decrease seizure excitability in epileptic rats. However, determination of the seizure excitability threshold needs to be elaborated. Qualitative and quantitative analyses of histological brain sections in the LPS-preconditioned rats showed markedly decreased intensity of neurodegenerative changes in the CA1, CA3 and DG hippocampal fields. The tendency was observed in all periods of the pilocarpine model of epilepsy. We suggest that preconditioning with LPS may have neuroprotective effects in the CA1, CA3 and DG hippocampal sectors; however, it has no influence on the course of the seizures in rats in the pilocarpine model of epilepsy.

Publication: Neurochem. Res. 35, 262–272, 2010, fig. 7. In English, summary in English.

Jadwiga Jaworska-Adamu, Radosław Szalak

CALRETININ IN DORSAL RAPHE NUCLEUS OF THE CHINCHILLA

The localisation of calretinin in the midbrains of 10 sexually mature chinchilla males was examined by carrying out the peroxidase-antiperoxidase immunocytochemical reaction using specific monoclonal antibody against calretinin. Intensive immunostaining for the protein was observed in the majority of fusiform, pyramidal and stellate neurons of dorsal raphe nucleus. A similar calretinin distribution in neurons of this region to those observed in primates and rodents was demonstrated.

Publication: Bull. Vet. Inst. Pulawy 54, 247–249, 2010, fig 1. In English, summary in English.

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JAWORSKA-ADAMU J., DMOWSKA M., CYBULSKA R., KRAWCZYK A., SCHOENBORN R., PAWLIKOWSKA-PAWLĘGA B., ŚNIEŻKO R.: Ultrastructure of astrocytes in the hippocampus of lipopolysaccharide preconditioned rats in pilocarpine model of epilepsy. (Ultrastruktura astrocytów w hipokampie szczurów hartowanych lipopolisacharydem w pilokarpinowym modelu epilepsji).

Ref. XLIV Symposium of the Polish Histochemical and Cytochemical Society. Wojanów, 13–15 IX 2010.

Publication: Materials of XLIV Symposium of the Polish Histochemical and Cytochemical 30, 2010. In Polish

JAWORSKA-ADAMU J., DMOWSKA M., CYBULSKA R., KRAWCZYK A., SCHOENBORN R., ŚNIEŻKO R.: Structure of astrocytes in the hippocampus of lipopolysaccharide preconditioned rats in pilocarpine model of epilepsy. (Struktura astrocytów w hipokampie szczurów hartowanych lipopolisacharydem w pilokarpinowym modelu epilepsji).

Ref. XLIV Symposium of the Polish Histochemical and Cytochemical Society. Wojanów, 13–15 IX 2010.

Publication: Materials of XLIV Symposium of the Polish Histochemical and Cytochemical 31, 2010. In Polish.

WAWRZY尼亚K-GACEK A.: Morphological changes in oligodendrocytes of the periaqueductal grey matter in old rats. (Morfologiczne zmiany oligodendrocytów istoty szarej środkowej u starych szczurów).

Ref. XLIV Symposium of the Polish Histochemical and Cytochemical Society. Wojanów, 13–15 IX 2010.

Publication: Materials of XLIV Symposium of the Polish Histochemical and Cytochemical 104, 2010. In Polish.

WAWRZYŃIAK-GACEK A.: Ultrastructure of oligodendrocytes in the periaqueductal grey matter in old male rats. (Ultrastruktura oligodendrocytów istoty szarej środkowej u starych samców szczurów).

Ref. XLIV Symposium of the Polish Histochemical and Cytochemical Society. Wojanów, 13–15 IX 2010.

Publication: Materials of XLIV Symposium of the Polish Histochemical and Cytochemical 105, 2010. In Polish.

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KRAWCZYK A., JAWORSKA-ADAMU J.: Synantocytes: the fifth type of glia? In comparison with astrocytes.

Publication: Folia Histochemica et Cytobiologica 48, 173–177, 2010. In English.

DEPARTMENT OF BIOCHEMISTRY AND ANIMAL PHYSIOLOGY

Akademicka 12, Lublin

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SUB-DEPARTMENT OF ANIMAL PHYSIOLOGY

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

RESEARCH STUDIES (SUMMARIES)

Teresa Jaśkiewicz, Iwona Puzio, Agnieszka Sagan

THE EFFECTS OF DIETARY SUPPLEMENTATION WITH CLA AND *Camelina sativa* SEEDS OIL ON PERFORMANCE OF BROILER CHICKENS

The objective of this study was to evaluate the effect of dietary conjugated linoleic acid (CLA) and false flax (*Camelina sativa*) seeds oil (FO), as a replacement for sunflower oil, on the performance of broiler chickens. Experiment was carried out on 96 chickens randomly divided into four groups – control: fed on the diet with sunflower oil (SO) and three experimental: fed on the diet with addition of CLA (2,86% starter, 4,32% grower) and fed on the diet with addition of CLA (1,43% starter, 2,16% grower) and SO or FO (1,43% starter, 2,16% grower). Daily weight gain, daily feed consumption, feed conversion ratio as well as final body weight were measured. No significant differences in growth performance were observed in the first period of experiment. In older birds dietary treatment with SO+CLA and FO+CLA daily weight gain, feed consumption

and final body weight slightly increased. No significant differences in the values of analyzed parameters between SO, CLA and SO+CLA groups were observed. In conclusion, the results indicated that false flax oil and CLA can replace sunflower oil in chickens' feeding, and demonstrated the effectiveness of false flax oil on the growth performance of broiler chickens.

Publication: Acta Sci. Pol. Med.Vet. 9, 4, 11–19, 2010, tab. 4. In English, summary in English.

Rickard Köhnke, Linnea Svensson, Jose Luis Valverde Piedra,
Stefan Grzegorz Pierzynowski, Björn Weström, Charlotte Erlanson-Albertsson

**FEEDING APPETITE SUPPRESSING THYLAKOIDS TO PIGS
ALTERS PANCREATIC LIPASE/COLIPASE SECRETION**

The mechanism for a new appetite suppressor named thylakoids (membrane proteins derived from spinach leaves) was examined *in vivo* in pigs. Thylakoids inhibit the lipase/colipase hydrolysis of triacylglycerols (TG) *in vitro* and suppress food intake, decrease body weight gain and raise the circulating satiety hormone cholecystokinin (CCK) in rats but its mechanism *in vivo* remains unclear. We hypothesized that a thylakoid-enriched diet prolongs intestinal digestion of food and therefore promote satiety signaling. Five pigs were surgically prepared with a fistula in the duodenum for collection of digesta and with two catheters, one in *v. jugularis* and one in *v. porta*, for blood collection. After 1 week of recovery and an overnight fast the pigs were fed a high-fat diet with and without supplementation with thylakoids. Duodenal content and blood samples were taken before and 15, 30, 60, 120, 240 and 360 min after feeding. Pancreatic lipase and colipase enzymes were measured in duodenal digesta. Blood samples were analyzed for the satiety hormone CCK as well as insulin and glucose. We found that pancreatic lipase/colipase level increased and stayed elevated for a longer time in the duodenum in the pigs receiving thylakoids compared to the control. CCK levels were unchanged. Insulin levels were significantly reduced by the thylakoid treatment without any change in blood glucose.

In conclusion, thylakoids increased lipase/colipase secretion. The mechanism for this secretion appears not to be related to CCK and may be an effect of vagal activation. Thylakoids gave reduced insulin levels without any change in glucose levels.

Publication: Livestock Sci., 134, 68–71, 2010, fig. 3. In English, summary in English.

Tomasz Skrzypek, Jose Luis Valverde Piedra, Henryk Skrzypek,
Waldemar Kazimierczak, Sylwia Edyta Szymańczyk, Romuald Zabielski

**CHANGES IN PIG SMALL INTESTINAL ABSORPTIVE AREA
DURING THE FIRST 14 DAYS OF LIFE**

The aim of this study was to evaluate the changes in small intestine absorptive area during the first 14 days of life in the pig. The duodenum and mid-jejunum were studied in a total of 16 piglets. Tissue samples were prepared for light microscopy (LM) and scanning electron microscopy (ScEM) at days 0, 3, 7 and 14 of life. The changes in villi density, height and width, crypt depth, mucosa thickness and amount of transversal furrows were used to appraise the surface of absorptive area. According to LM data, villus length and width, crypt depth and mucosa thickness increases from day 0 to day 3, and decreases from day 3 to day 14. ScEM study showed that the villus density reduced from day 0 to day 14 in duodenum, and from day 0 to day 3 in mid-jejunum. The surface of absorptive area was increased almost 3-fold in the duodenum from day 3 to day 7 and more than 2-fold in the jejunum in the same period.

Publication: Livestock Sci., 133, 53–56, 2010, fig. 2, tab. 2. In English, summary in English.

Ewa Śliwa

**2-OXOGLUTARIC ACID ADMINISTRATION DIMINISHES FUNDECTOMY
INDUCED OSTEOPENIA IN PIGS**

Partial surgical removal of the stomach (fundectomy, FX) leads to osteopenia in animals and humans. FX adversely affects the bone. 2-oxoglutaric acid is a precursor of glutamine and hydroxyproline – the most abundant amino acid of collagen. The aim of the study was to investigate the effects of 2-oxoglutaric acid on FX-evoked osteopenia in pigs. Eighteen castrated male pigs of the Puławska breed were used. Twelve pigs were subjected to FX and divided into two groups: FX + AKG (the AKG group; AKG at the daily dosage of 0.4 g/kg of body weight) and FX + Placebo (the FXC group; received CaCO₃ as placebo). Remaining six pigs were sham-operated (the SHO group). The pigs were euthanized at the age of 8 months and long bones were collected. Area bone mineral density (aBMD) and bone mineral content (BMC) were measured; morphology, geometry and biomechanical properties were determined. Moreover, the serum concentrations of selected hormones and one marker of bone metabolism were determined. FX caused osteopenia in the pigs and treatment with AKG greatly reduced these effects of FX in pigs. Negative effect of fundectomy on the skele-

tal system leading to decreased bone mass in pigs is associated with lowered body gain and activity of the gastric–hypothalamic–pituitary axis. Better definitions of each of the local and systemic hormonal and structural components associated with fundectomy-induced decreased bone mass that separately and together determine the whole bone properties may lead to identify opportunities for prevention.

Publication: J. Anim. Physiol. Anim. Nutr., 94, 86–95, 2010, tab. 4. In English, summary in English.

Ewa Śliwa, Łukasz Adaszek, Marcin R. Tatara, Piotr Dobrowolski

SHORT- AND LONG-TERM CONSEQUENCES ON BIOCHEMICAL MARKERS FOLLOWED FUNDECTOMY IN PIGS SUPPLEMENTED WITH 3-HYDROXY-3-METHYLBUTYRATE AND ALPHA-KETOGLUTARATE

The aim of this study was to investigate short-term 4 and 14 weeks after fundectomy) and long-term (at the age of 8 months) postoperative effects of 3-hydroxy-3-methylbutyrate and/or alpha-ketoglutarate on selected serum biochemical markers in fundectomized pigs. Experimental fundectomy was performed in 30 castrated male pigs of the Puławska breed who received placebo or 3-hydroxy-3-methylbutyrate and/or alpha-ketoglutarate up to the age of 8 months. Plasma amino acid concentrations and selected blood parameters were analyzed. Main vital organs were weighed. Our study showed that the supplementations with alpha-ketoglutarate and/or 3-hydroxy-3-methylbutyrate to fundectomized pigs significantly prevented the reduction of stomach, liver and spleen weights. However, results of this study, either positive or negative, cannot categorically establish a beneficial effect of AKG and HMB nutritional support after fundectomy in pigs.

Publication: Berl. Münch. Tierärztl. Wschr., 123, 397–405, 2010, fig. 1, tab. 9. In English, summary in English.

Ewa Śliwa, Piotr Dobrowolski, Tomasz Piersiak

BONE DEVELOPMENT OF SUCKLING PIGLETS AFTER PRENATAL, NEONATAL OR PERINATAL TREATMENT WITH DEXAMETHASONE

In mammals, the release from growth-inhibiting conditions results in catch-up growth. To investigate animal evidence for whether prenatal dexamethasone (DEX) treatment leads to the development of growth restriction especially reduced mineralization of skeleton, and release from it leads to the phenomenon of

catch-up, piglets were prenatally exposed to DEX (3.0 mg/sow per day⁻²) during the last 24 days of prenatal life and tested further in two different ways: discontinued at birth and continued administration of DEX (0.5 mg/kg day⁻²) to piglets through 30 days of neonatal life. Using dual energy X-ray absorptiometry methods, bone mineral density (BMD) and bone mineral content (BMC) were measured. The three-point bending test was applied to determine the mechanical properties of the bones. Furthermore, geometric properties of the bones were assessed. Serum concentration of osteocalcin (OC) was determined. Histomorphological analysis of the ribs was also performed. The consequences of neonate DEX treatment and in utero DEX exposure were reflected in a dramatic decrease of BMD, BMC and blood serum OC concentration and geometric parameters of piglets' bones. Prenatal action of DEX during the last 24 days of pregnancy resulted in continued neonatal modification of bone tissues, thus diminishing bone quality, and negatively influenced structural development and mechanical properties, finally increasing the risk of fractures of ribs and limb bones. Prenatal DEX treatment limited to the last 24 days of foetal life did not reduce the term birth weight and the growth of suckling piglets followed up to 30 days of neonatal life, and catch-up in bone mineralization did not occur.

Publication: J. Anim. Physiol. Anim. Nutr., 94, 293–306, 2010, fig. 2, tab. 6. In English, summary in English.

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Ref.: VII Symposium of Young Researcher "Physiology and Biochemistry in Animal Nutrition". Kraków, 20–21 IX 2010.

Publication: Proceedings of VII Symposium of Young Researcher "Physiology and Biochemistry in Animal Nutrition", 67–69, 2010. In English.

ANTUSHEVICH H., KRAWCZYŃSKA A., KAPICA M., ZABIELSKI R.: Effects of apelin on IEC-6 cell apoptosis.

Ref.: V Symposium on Brain-Viscera Axis: Basic and Clinical Aspects. Kraków, 25 IX 2010.

Publication: Medical Science Monitor 16, suppl. 2, 10, 2010. In English.

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Ref.: Perinatal Biology Conference. Aspen, 28–31 VIII 2010.

Publication: Pediatric Res. 68, 17, 2010. In English.

- DOBROWOLSKI P., ŚLIWA E., PUZIO I., BIENKO M., GAWRON A.: Effect of prenatal treatment with maximal therapeutic dexamethasone dose on structure of piglets bones. Ref. XXXVII European Symposium on Calcified Tissues. Glasgow, 26–30 VI 2010. *Publication: Bone, 47, suppl. 1, 94–95, 2010. In English.*
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- GRUJIC D., VALVERDE PIEDRA J.L., PRYKHODKO O., SZYMAŃCZYK S., PIERZYŃOWSKI S.G.: Liprotamase, a non-porcine enzyme therapy, restores growth, and normalizes lipid absorption in pigs with exocrine pancreatic insufficiency (EPI). Ref. LXXV Annual Scientific Meeting of the American College of Gastroenterology (ACG), San Antonio, Texas, USA, 15–20 X 2010. *Publication: Am. J. Gastroenterol. 105, 136, 2010. In English.*
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- PUZIO I., JAŚKIEWICZ T., SAGAN A., BIENKO M., GRABOŚ D.: Effects of dietary supplementation with CLA and *Camelina sativa* seeds oil on bone properties in broiler chickens. (Wpływ dodatku CLA oraz oleju z nasion lnianki siewnej, *Camelina sativa*, na właściwości kości kurcząt brojlerów). Ref. XXXIX Scientific Session of The Committee of Animal Nutrition Polish Academy of Science “Nutrition in regulation of development and productivity of animals”. Rynia, 26–28 V 2010. *Publication: Proceedings of the XXXIX Scientific Session of The Committee of Animal Nutrition Polish Academy of Science, 68–69, 2010. In Polish and English.*

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Ref. XXXVII European Symposium on Calcified Tissues, Glasgow, 26–30 VI 2010.
Publication: Bone, 47, suppl. 1, 241, 2010. In English.

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Ref. XXXVII European Symposium on Calcified Tissues. Glasgow, 26–30 VI 2010.
Publication: Bone, 47, suppl. 1, 104–105, 2010. In English.

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Ref. XXXVII European Symposium on Calcified Tissues. Glasgow 26–30 VI 2010.
Publication: Bone, 47, suppl. 1, 98–99, 2010. In English.

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Publication: Bone, 47, suppl. 1, 12, 2010. In English.

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Ref. XXXVII European Symposium on Calcified Tissues. Glasgow, 26–30 VI 2010.
Publication: Bone, 47, suppl. 1, 89–90, 2010. In English.

VALVERDE PIEDRA J.L., SZYMAŃCZYK S., GRUJIC D., SZWIEC K., BALA T., WESTRÖM B., PIERZYŃOWSKI S.G.: Liprotamase, a microbially derived enzyme preparation, restores growth in pigs with exocrine pancreatic insufficiency (EPI).

Ref. XXIII Meeting of the European Intestinal Transport Group, Salerno, Italy, 7–10 IV 2010.
Publication: Genes. Nutr. 5, suppl. 1, 95, 2010. In English.

OTHER PUBLICATIONS

TATARA M., STUDZIŃSKI T.: Natural biologically active substance – β -hydroxy- β -methylbutyrate (HMB, 3-hydroxy-3-methylbutyrate, β -hydroxy- β -methylbutyric acid) as the positive metabolically active factor in relation to regulatory processes of growth, development and homeostasis maintenance of bone tissue in vertebrates. (Naturalna biologicznie aktywna substancja – β -hydroksy- β -metyloasmałan (HMB, 3-hydroksy-3-metyloasmałan, kwas β -hydroksy- β -metyloasmałowy) jako pozytywny czynnik aktywny metabolicznie w odniesieniu do procesów regulacji wzrostu, rozwoju i utrzymania homeostazy tkanki kostnej kręgowców).

Publication: Monografia: Osiągnięcia Nauki Polskiej, 2010, 119-125, 2010. In Polish.

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 COLOSTRUM, MILK AND BLOOD OF EARLY POSTPARTUM COWS DURING THEIR FIRST AND SECOND LACTATION

The aim of the study was to compare antioxidative/oxidative profile in blood, colostrum and milk of early post-partum cows during their first and second lactation. A total of 19 healthy, primiparous cows were included in experiment and samples were collected during 2 years from the same animals immediately after parturition, 24, 48 h as well as 6 and 12 days later. All parameters including the activity of glutathione peroxidase (GSH-Px), total antioxidant capacity (TAC), the content of vitamin A, C as well as the contents of products of lipid and protein peroxidation were determined by the use of spectrophotometric methods. Comparing the profile within lactation, TAC and GSH-Px activity in blood showed decreasing trends, while parameters of lipid and protein peroxidation fluctuated. All examined parameters in colostrum and milk except from intermediates of lipid peroxidation exhibited increasing trends.

These results which showed dynamic changes of antioxidative/oxidative profile not only in blood but also in colostrum / milk within examined period of time suggested appropriate answer of organism to current challenge. Moreover, not uniform but detectable changes between first and second lactation suggested that two consecutive lactations are not the same. Comparing first and second lactation, TAC and parameters of lipid and protein peroxidation in blood showed increasing tendency in second as first lactation while GSH-Px activity was opposite. The content of antioxidative vitamins and SH groups in colostrum/milk showed increasing tendency in second as first lactation, while TAC and content of end products of lipid peroxidation showed opposite trend, and GSH-Px together with intermediates of lipid peroxidation remained stable. Molecular and biochemical background for it require further elucidation.

Publication: Reprod. Domest. Anim. 45, 417–425, 2010, fig. 7, tab. 1. In English, summary in English.

Iwona Janczarek, Witold Kędzierski, Izabela Wilk

PULSE CHANGEABILITY OF TROTTERS DEPENDING ON MOTION PACE

This study has attempted to define the influence of movement pace of trotters onto their heart rate (HR). This influence is one of the basic problems in the selecting of training methods. Additionally, the pace level was determined to keep the horse's organism on the level of safe oxygen transformations. Telemetric recorder of heart rate was used in the research to define the HR in trotters within the movement pace between 15 and 35 km/h. Based on analysed cases, three levels of HR scores were distinguished: 100–140 beats/minute “safe”, 141–170 beats/minute “threatening” and over 170 beats/minute “dangerous”. An increase of movement pace causing the growth of HR in trotters were noted, which was proved by average HR scores in particular speed ranges as well as correlation coefficient. Their range was significant at $P \leq 0.01$ in each case and reached the level between 0.785 and 0.951 (mares) and 0.849 to 0.984 (stallions). Trotters' sex did not have a decisive influence on the pulse level at work with changing velocity, which mainly pertained to the second and third level. Minimum velocity ranges causing anaerobic transformations in the organism were also distinguished. Based on that, it was established that training which includes the speed up to 17.5 km/h should keep the organism on the level of oxygen transformations. The threat of organism acidifying may occur at 18–21.5 km/h and anaerobic conversion may occur at 22 km/h.

Publication: Annales UMCS (Lublin), sectio EE, 28, 17–25, 2010, tab. 4. In English, summary in English and Polish.

Marta Kankofer, Edyta Albera, Maren Feldman, Natascha Gundling,
Martina Hoedemaker

COMPARISON OF ANTIOXIDATIVE/OXIDATIVE PROFILES IN BLOOD PLASMA OF COWS WITH AND WITHOUT RETAINED FETAL PLACENTAL MEMBRANES

Ante- and postpartum antioxidative/oxidative profiles in blood plasma of cows with and without retained placental membranes (RFM) were investigated. Twenty-two healthy pregnant cows were included in the study. Seven animals out of 22 suffered from RFM. Blood samples were obtained at 4, 3, 2, 1 weeks and 5 days antepartum (a.p.), at parturition and 1, 3, and 5 weeks postpartum. The following antioxidative parameters were measured using spectrophotometric methods: total antioxidant activity (TAC), β -carotene, vitamin A, vitamin C, and

ceruloplasmin. The oxidative profile was based on the content of intermediates and end products of lipid and protein peroxidative processes which were measured by spectrophotometric and spectrofluorimetric methods. The examined parameters revealed a dynamic profile within the experimental period. The highest antioxidant and oxidant activity was noted at 2 and 1 week a.p. with a drop towards parturition suggesting the presence of oxidative stress during this time period and an apparent appropriate metabolic response of the macroorganism. Except for TAC and vitamin A, the contents of oxidative and antioxidative blood constituents did not differ between cows with and without RFM. A TAC and vitamin A by time interaction indicated higher antepartal concentrations of TAC and vitamin A in cows without RFM than in cows with RFM suggesting a possible role of antioxidative/oxidative imbalances in the aetiology of RFM.

Publication: Theriogenol. 74, 1385–1395, 2010, fig. 2, tab. 2. In English, summary in English.

Marta Kankofer, Edyta Albera, Monika Róžańska-Boczula

**ACTIVITIES OF N-ACETYL- β -D-GLUCOSAMINIDASE
AND GLUTATHIONE PEROXIDASE IN BOVINE COLOSTRUM AND MILK**

Parturition and *post partum* period are susceptible for antioxidative/oxidative imbalance as well as inflammatory processes related to either uterus or mammary gland. Fifteen Holstein-Friesian cows were used to examine the relationship between the antioxidant enzyme glutathione peroxidase (GSH-Px) and inflammatory enzyme N-acetyl-glucosaminidase (NAGase) in colostrum and milk during 12 days after parturition. Samples from each udder quarter were collected immediately after parturition, after 24 h and 48 h as well as after 6 and 12 days *post partum*. The activity of GSH-Px was measured spectrophotometrically and NAGase spectrofluorimetrically. NAGase activity generally remained constant during the examined period confirming no inflammation and healthy udder. Moreover, no significant differences in the activity among quarters were detected. The activity of GSH-Px rose significantly ($P < 0.05$) in the examined period suggesting the dynamic balance of antioxidative defence. No differences among quarters confirmed that in healthy quarters metabolic processes are on a similar level but positive correlations between the antioxidative and inflammatory enzyme in quarters and with regard to time may suggest a possible relationship during inflammation.

Publication: Czech J. Anim. Sci. 55, 488–495, 2010, fig. 2. In English, summary in English.

Witold Kędzierski

**THE EFFECT OF TRAINING ON PLASMA L-CARNITINE METABOLISM
IN PUREBRED ARABIAN HORSES**

The aim of this study was to evaluate how training affects the plasma total, and free and esterified L-carnitine concentration in horses. The study was done on a total of 32 healthy, trained Purebred Arabian horses. The 32 horses were composed of two groups. In the first group, 18 three-year-old horses involved in race-training were studied at rest. In the second group 14 stallions were studied during the typical race or endurance training session. Jugular venous blood samples were collected to determine lactic acid (LA), free fatty acids, glycerol, triacylglycerides (TG), and the total of esterified and free L-carnitine content. The race training session caused a significant increase in blood LA and plasma esterified L-carnitine, glycerol, and TG levels. The race training session caused a decrease in the plasma free L-carnitine concentration determined just after the end of effort.

This means that compared with endurance training, high-intensity racing exercise increased the plasma esterified L-carnitine and decreased the free L-carnitine concentration according to the intensity of applied effort.

Publication: J. Anim. Feed Sci. 19, 398–407, 2010, tab. 2. In English, summary in English.

Justyna Lipko-Przybylska, Edyta Albera, Marta Kankofer

**COMPARISON OF ANTIOXIDANT DEFENCE PARAMETERS IN COLOSTRUM
AND MILK BETWEEN BERRICHON DU CHER EWES AND UHRUSK EWES**

The aim of the study was to evaluate the profile of antioxidant parameters in ewes' colostrum and milk in relation to breed during 5 d post partum. Total antioxidant capacity (TAC) was analysed and the activity of the enzymic antioxidants, glutathione peroxidase (GSH-Px) and glutathione transferase (GSH-Tr), as well as the concentration of the non-enzymic antioxidants, vitamin C, vitamin A and beta-carotene, were measured. Samples were collected from healthy animals belonging to two ewe breeds: Berrichon du Cher (n = 15) and Uhrusk (n = 15) kept in the Podlasie Province (Poland). Colostrum was sampled directly after parturition, as well as after 12, 24 and 48 h later and milk was sampled 5 d after parturition. Colostrum and milk for the evaluation of all parameters except for vitamin A and beta-carotene were centrifuged, and the supernatant was used for further analysis. Spectrophotometric methods were used for biochemical measurements. The results showed dynamic changes of antioxidative parameters within the time

period examined. TAC values and GSH-Px activity increased significantly during the experiment. GSH-Tr activity showed a similar tendency in Uhrusk ewes but an opposite relationship in Berrichon du Cher. Concentrations of examined vitamins followed the increasing trends noticed in the activities of antioxidative enzymes. Moreover, differences between breeds in the evaluated parameters were detected; these differences were not unequivocal however. The results are also a source of not previously published physiological antioxidant profile in colostrum and milk of ewes over the post-partum period.

Publication: J. Dairy Res. 77, 117–122, 2010, fig. 6. In English, summary in English.

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Ref. XIV Annual Conference of the European Society for Domestic Animal Reproduction. Eger, 15–18 IX 2010.

Publication: Reprod. Domest. Anim. 45, suppl. 1, 92, 2010. In English.

DEPARTMENT AND CLINIC OF ANIMAL INTERNAL DISEASES

Głęboka 30, Lublin

Head: Prof. ordin Dr. habil. Zbigniew Pomorski
Dr. habil. Krzysztof Lutnicki
Dr. habil. Jacek Madany

RESEARCH STUDIES (SUMMARIES)

Iwona Taszkun

THE EVALUATION OF CANINE ATOPIC DERMATITIS EXTENT AND SEVERITY INDEX (CADESI) TEST IN DOGS WITH ATOPIC DERMATITIS (AD) TREATED WITH CYCLOSPORINE OR PREDNISONE

The purpose of this study was to assess the clinical state of dogs with atopic dermatitis (AD) by use of CADESI test in own modification during the first visit in the Dermatology Consult Room as well as during the treatment. The study was performed in two groups (I-E and II-C) of 20 dogs in each group. In dogs which were qualified to the I-E group, as antiallergic, anti-inflammatory and antipruritic treatment, prednisone (oral preparation Encorton – Polfa Pabianice) at dose 0.5 mg/kg b.w./day was administered, while in dogs qualified to the II-C group – cyclosporine (oral preparation Sandimmun Neoral – Novartis Pharma) at a dose of 5 mg/kg b.w./day; the treatment was continued for 6 weeks in both groups. During the study, skin lesions were assessed in 15 specified body areas using 4 parameters and 5-point scale. In group I-E and II-C the amount of received points in CADESI test was decreased by 82.26 and by 83% respectively, after the treatment. Statistical analyses of the results obtained revealed no statistically significant ($P = 0.05$) differences between means of I-E and II-C groups in consecutive examinations, which indicates comparable clinical efficacy of both drugs. Statistically significant differences ($P = 0.05$) of the parameters assessed were found after secondary dermatoses treatment, and after every two weeks of antipruritic and anti-inflammatory treatment.

Publication: Pol. J. Vet. Sci., 13, 681–688, 2010, fig. 2, tab. 3. In English, summary in English.

Iwona Taszkun

**ASSESSMENT OF PRURITUS USING PRURITUS SCORE TEST IN DOGS
WITH ATOPIC DERMATITIS TREATED WITH CYCLOSPORINE OR PREDNISONE**

The purpose of this study was to evaluate the suitability of pruritus score test in pruritus diagnosis in dogs. The test was used to assess the frequency and severity of pruritus in dogs between 1 and 3 years of age, suffering from atopic dermatitis. Skin pruritus was assessed: during the first visit (examination 0), after elimination of secondary dermatosis (examination 1), 2 weeks after the treatment with prednisone – group I-E or cyclosporine – group II-C (examination 2) as well as 6 weeks after treatment (examination 3). In examination 0, the skin pruritus in all dogs was scored at 26.75%. Reduction of pruritus was observed during the treatment in examination 3 in dogs of group I-E (by 80.46%) and in dogs of group II-C (by 86.12%) in comparison with examination 0. Localisation of pruritus in particular body parts was also examined, resulting in observation that in examination 0 it was mostly found in interdigital space of front paws, facial part of the muzzle, chin, ears but not always with the same intensity in symmetrically placed body parts. Mean values of the measurement were statistically significant ($P < 0.005$) after 2, 4, and 6 weeks of the treatment in I-E and II-C groups. No statistically significant differences were observed between I-E and II-C groups in consecutive measurements.

Publication: Bull. Vet. Inst. Pulawy 54, 687–692, 2010, tab. 4. In English, summary in English.

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Publication: Top Agrar Polska 2, 32–34, 2010. In Polish, summary in Polish.

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Publication: Veterinářství 60, 69–71, 2010. In English, summary in English.

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Publication: Proceedings of the XI Silesian Diagnostic Congress, 113–128, 2010. In Polish, summary in Polish.

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Publication: Weterynaria w Praktyce 6, 62–68, 2010. In Polish, summary in English.

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Ref.: XVIII Congress of the Veterinary Medicine of the Polish Small Animal Veterinary Association. Warszawa, 8–10 X 2010.

Publication: Proceedings of the XVIII Congress of Polish Small Animal Veterinary Association, 120–125, 2010. In Polish, summary in Polish.

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Ref.: XVIII Congress of the Veterinary Medicine of the Polish Small Animal Veterinary Association. Warszawa, 8–10 X 2010.

Publication: Proceedings of the XVIII Congress of Polish Small Animal Veterinary Association, 263–268, 2010. In Polish, summary in Polish.

DEPARTMENT AND CLINIC OF ANIMAL REPRODUCTION

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Prof. extraordin. Dr. habil. Zygmunt Wrona,
Prof. extraordin. Dr. habil. Leszek Krakowski,
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RESEARCH STUDIES (SUMMARIES)

Leszek Krakowski, Cezary Krawczyk, Zygmunt Wrona, Roman Dąbrowski,
Łukasz Jarosz

LEVELS OF SELECTED T LYMPHOCYTE SUBPOPULATIONS IN PERIPHERAL BLOOD OF MARES WHICH EXPERIENCED EARLY EMBRYONIC DEATH

The objective of the present study was to analyse the immune status of mares in the early stages of pregnancy and mares which experienced early embryonic death (EED). Forty-eight fertile purebred Arabian mares were used for the study. The mares were divided into two groups. Group I was the control group composed of 32 mares in the early stages of a normal pregnancy. Group II was composed of 12 mares which had experienced EED. In both groups, subpopulations of T lymphocytes containing CD2⁺, CD4⁺ and CD8⁺ were characterized using the flow cytometry method. The percentages of CD3⁺ lymphocytes (adding up the cells with CD4⁺ and CD8⁺ phenotypes) and of NK cells (subtracting CD3⁺ cells CD2⁺ lymphocytes) were calculated. Moreover, due to its suppressive effects on T lymphocytes during pregnancy, TGF-β1 was determined using ELISA.

The findings revealed that in mares with EED, the percentages of lymphocytes TCD2⁺, TCD4⁺, NK cells at EED, i.e. between day 14 and 21, were significantly higher compared to mares without EED. The changes in the CD4⁺/CD8⁺ ratio were similar. In the EED group, this ratio significantly increased between the 96th hour and the 30th day after ovulation compared to mares without EED. Otherwise, serum levels of TGF-β1 in the EED group were significantly lower than in the control group. The results show that mares, which experienced an EED develop inflammatory reactions which activate Th1 cell immune responses.

Publication: Anim. Reprod. Sci. 120, 71–77, 2010. fig. 7. In English. summary in English.

Marek Szczubiał

**NON-ENZYMATIC ANTIOXIDATIVE DEFENCE MECHANISM IN PLASMA OF PIGS
DURING PERIPARTURIENT PERIOD: WITAMIN C AND GLUTATHIONE**

The aim of the study was to determine plasma levels of vitamin C and reduced glutathione (GSH) in sows between the day 14 prepartum and day 14 postpartum. The study involved twenty-four sows of three breeds – Polish Large White (PLW), Polish Landrace (PL) and PLW × PL aged 1–3 years. All animals were from one closed-cycle production farm. The mean vitamin C level on days 13–14 prepartum reached 0.49 (± 0.19) mmol/g protein and decreased significantly ($P < 0.05$) at 24–48 h postpartum to the value of 0.33 (± 0.19) mmol/g protein. On days 6–7 and 13–14 postpartum, the vitamin C level further decreased to 0.17 (± 0.006) and 0.15 (± 0.007) mmol/g protein, respectively. The mean GSH level on days 13–14 before delivery was 0.071 (± 0.009) mmol/g protein and decreased significantly ($P < 0.05$) at 24–48 h before delivery to the value of 0.062 (± 0.018) mmol/g protein. In this period, the mean GSH level was similar to that observed during the first 24–48 h postpartum. On day 6–7 after delivery, the level of GSH reached the values observed on days 13–14 and 6–7 prepartum. On days 13–14 postpartum, the level of GSH was found to be 0.115 (± 0.029) mmol/g protein and was significantly higher ($P < 0.001$) compared to that on days 13–14 prepartum. The study findings suggest that porcine levels of vitamin C and glutathione decrease during the periparturient period, which indicates impaired non-enzymatic mechanisms of antioxidative defence.

Publication: Bull. Vet. Inst. Pulawy 54, 373–376, 2010. tab. 1. In English, summary in English.

Władysław Wawron, Mariola Bochniarz, Roman Dąbrowski

**ANTIFUNGAL SUSCEPTIBILITY OF YEASTS ISOLATED FROM SECRETION
OF INFLAMED MAMMARY GLANDS IN COWS**

Antifungal susceptibility of 150 strains of yeasts isolated from the infected mammary secretion of cows was determined. Their susceptibility to amphoterycin B, nystatin, flucytosine, tioconazole, ketoconazole, miconazole, fluconazole and clotrimazole was evaluated using the disc diffusion method on Yeast Nitrogen Base (YNB) and filter paper discs. The most active antifungal agents *in vitro* were found to be: tioconazole – 96.7%, nystatin – 95.4%, amphoterycin – 94.0%, and flucytosine – 92.7% of susceptible strains; the least active were fluconazole and clotrimazole – 39.3% and 60.0% of susceptible strains, respec-

tively. The individual species of yeasts were characterized by varied susceptibility to individual therapeutics.

Publication: Pol. J. Vet. Sci. 13, 487–490, 2010, tab. 1. In English, summary in English.

Władysław Wawron, Mariola Bochniarz, Tomasz Piech

YEASTS MASTITIS IN DAIRY COWS IN THE MIDDLE-EASTERN PART OF POLAND

The aim of study was to assess the incidence of *mastitis mycotica* in the middle-eastern part of Poland and to determine genera and species of yeasts, which cause this kind of inflammation. The study involved 2,122 milk samples from cows with clinical and subclinical *mastitis* from the Lublin and Warsaw region of Poland. The aseptic samples of milk or infected secretion were delivered to the Department laboratory and cultured on the agar and Sabouraud medium with addition of chloramphenicol. Fungi constituted 7.07% of all etiological agents of *mastitis*. Four species of fungi were stated: *Candida*, *Trichosporon*, *Rhodotorula*, and *Cryptococcus*. *Candida* sp. was most commonly isolated. The most abundant species included *C. krusei*, *C. kefyri*, and *C. lusitanae*. Yeast-like fungi were most frequently isolated towards the end of winter and in spring.

Publication: Bull. Vet. Inst. Pulawy 54, 201–204, 2010, tab. 3. In English, summary in English.

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Publication: Bydło 10, 38–39, 2010. In Polish.

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Publication: Bydło 10, 64–68, 2010. In Polish.

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Publication: Bydło 11, 20–21, 2010. In Polish.

PIECH T.: Healthy udder – healthy milk. Part 2 (Zdrowy gruczoł mlekowy – zdrowe mleko. Część 2).

Publication: Bydło 11, 72–75, 2010. In Polish.

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Publication: Bydło 12, 70–72, 2010. In Polish.

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Publication: Bydło 12, 44–45, 2010. In Polish.

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Publication: Weterynaria w Terenie 2, 40–43, 2010. In Polish.

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Publication: Weterynaria w Terenie 2, 51–53, 2010. In Polish.

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Publication: Państwowy Instytut Weterynaryjny – Państwowy Instytut Badawczy w Puławach, 283–287, 2010. In Polish.

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Publication: Wielkopolskie Wydawnictwo Rolnicze, Poznań, 199–260, 2010. In Polish.

DEPARTMENT AND CLINIC OF ANIMAL SURGERY

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Prof. Dr. habil. Ireneusz Balicki

RESEARCH STUDIES (SUMMARIES)

Ireneusz Balicki, Alexandra Trbolova

CLINICAL EVALUATION OF TACROLIMUS EYE DROPS FOR CHRONIC SUPERFICIAL KERATITIS TREATMENT IN DOGS

The aim of this study was to assess the efficacy of 0.02% tacrolimus ophthalmic drops application for chronic superficial keratitis (CSK) treatment in dogs. The studies included 14 German Shepherd dogs – 8 males and 6 females aged between 2–10 years with CSK. The patients were treated with eye drops – 0.02% tacrolimus which were administered to the ocular surface three times a day. Prior to the treatment onset and after the 5 week medical therapy, there was estimated a conjunctiva redness, ocular discharge as well as depigmentation of the third eyelid and blood vessel ingrowth in each corneal quadrant and corneal pigmentation. The photo images with calibrated grid enabled to calculate the percentage of corneal area surface affected by inflammatory process. Tacrolimus 0.02% did not exert any irritant effects throughout the CSK management. The therapy has led to the decrease of corneal inflammatory infiltrate and blood vessel ingrowth in all the patients. Median corneal area surface affected by the condition showed a statistically significant decrease from 46 to 27% ($P < 0.01$) in the case of the left corneas and from 58 to 33% for the right ones. Out of 27 corneas affected by pigmentation, 13 corneas in 8 patients exhibited decreased pigmentation. The increased pigmentation was observed on 8 corneas in 5 patients. The studies proved that 0.02% ophthalmic drops of tacrolimus have been effective topically in CSK. A treatment response was observed by reduced granulation tissue and corneal neovascularization, still in some cases tacrolimus failed to inhibit the pigmentation formation.

Publication: Bull. Vet. Inst. Pulawy 54, 251–258, 2010, fig. 10, tab. 3. In English, summary in English.

Andrzej Ćwiek, Ireneusz Balicki, Dorota Różańska

**INTRAVENOUS MIDAZOLAM AS AN INDUCTION AGENT
FOR INHALATION ANAESTHESIA IN DOGS**

The aim of this study was to evaluate midazolam as an intravenous induction agent for inhalation anaesthesia in routine castration of dogs. It was investigated the dose required for induction as well as its effects on the dog's general conditions, arterial blood gas and acid base balance. A total of 24 male dogs of various breeds were studied, ranging in age from 1 to 11 years and in weight from 5 to 27 kg. Dogs were recruited at the Department and Clinics of Animal Surgery, University of Life Sciences in Lublin, Poland. The dogs were premedicated intramuscularly with xylazine and atropine sulphate at dose rates of 2 mg/kg and 0.05 mg/kg respectively. At 20 minutes from premedication, midazolam was administered by intravenous infusion. Intravenous midazolam proved useful as an induction agent for inhalation anaesthesia. The dose used was dependent on the animal's reaction. Induction of anaesthesia by midazolam was successful and allowed endotracheal intubation and inhalation anaesthesia with a halothane-oxygen mixture. The application of midazolam with halothane, however, led to transitory disturbances in systemic acid-base balance due to gas exchange abnormalities. The median effective dose of midazolam for induction of anaesthesia was 0.46 mg/kg i.v. Postoperatively, a full recovery of consciousness and motor functions was rapidly achieved in all dogs. Further studies on midazolam as an intravenous induction agent for inhalation anaesthesia in the dog are warranted.

Publication: Medycyna Wet. (Lublin) 66, 37–39, 2010, tab. 3. In English, summary in English.

Elżbieta Pamuła, Elżbieta Menaszek, Piotr Malisz, Piotr Dobrzyński,
Maciej Orzelski, Piotr Silmanowicz

**TOMOGRAPHIC AND HISTOLOGICAL ASSESSMENT OF BONE REGENERATION
IN THE EXPERIMENTAL DEFECTS IN RABBIT FEMORAL TRACHLEA TREATED
WITH RESORBABLE SCAFFOLDS**

Nowadays a great attention is down to resorbable materials, for example copolymers of lactide and glycolide (PLG), as potential materials enhancing bone tissue regeneration. It is related to the fact that one may control their biodegradation by changing lactide/glycolide ratio, chain microstructure, molecular mass and crystallinity. PLG materials can be processed into scaffolds which mimic the structure of spongy bone, thus provide temporary matrix enhancing osteogenic

cells adhesion, proliferation and differentiation. Moreover the PLG scaffolds can be modified with hydroxyapatite (Hap), the most abundant mineral component in natural bone, in order to ensure better conditions to adhering cells and to promote the mineralization of newly-formed tissue. Our previous experiments showed that the scaffolds produced from PLG materials support growth and differentiation of osteogenic cells *in vitro*. This study aims at analyzing bone tissue regeneration in critical-size experimentally created bone defects in rabbits treated with different PLG scaffolds using computed tomography and histological technique.

Publication: Engineering of Biomaterials (Kraków) 99, 123–124, 2010, fig. 3. In English, summary in English.

Dorota Różańska, Paweł Różański, Izabela Polkowska, Ireneusz Balicki,
Maciej Orzelski

**EXTERNAL COAPTATION OF TARSOMETATARSAL FRACTURE
IN A COMMON BUZZARD (*Buteo buteo*)**

Bone fractures are common in birds. Avian long bones, although very strong, have thin cortices and contain more calcium than mammalian bones; therefore, they are more brittle and susceptible to injuries. Injured avian bones readily splinter. The bird's movements, and the sharp edges of fractured bone, may cause soft tissue and skin damage, potentially resulting in an open, contaminated fracture. Especially susceptible bones are those with little soft tissue coverage, such as the tibiotarsus or tarsometatarsus. This article describes a case of comminuted distal tarsometatarsal and open fracture in common buzzard. It reviews traditional methods of tarsometatarsal fracture repair, and their advantages and disadvantages for use in the presented case, and describes the surgical treatment and external coaptation of fractured bone used on this patient.

Publication: J. Wildlife Rehab. 30, 19–22, 2010, fig. 8. In English, summary in English.

Tomasz Szponder, Joanna Wessely-Szponder

**PLASMA LEVEL OF PROTEIN C, FIBRINOGEN CONCENTRATION,
AND PLATELET NUMBER IN DOGS WITH LEGG-CALVE-PERTHES DISEASE
AND OSTEOCHONDROSIS-PRELIMINARY STUDIES**

Developmental bone diseases including Legg-Calve-Perthes disease (LCPD) and osteochondrosis (OC) are serious problems in veterinary practice, which leads to chondrial deformation and locomotory dysfunction in dogs. The cause of both disorders remains unknown. In our study we examined the possible role

of coagulatory disorders in pathogenesis of LCPD and OC. It was observed decrease of protein C level in dogs with LCPD ($94.31 \pm 4.74\%$) in comparison with healthy dogs ($95.8 \pm 6.35\%$). Moreover, in OC animals the value varied between 92.25 ± 2.5 and $94.33 \pm 5.5\%$. The mean fibrinogen level in plasma in control group was 2.69 ± 0.65 mg/ml, whereas in OC groups significantly higher values were observed. Platelets number varied between individuals but was within normal range in all groups. Taking into account decrease of protein C plasma level and increase of fibrinogen concentration, we revealed the relation between developmental diseases in dogs and coagulation disorders.

Publication: Bull. Vet. Inst. Pulawy 54, 433–436, 2010, fig. 2. In English, summary in English.

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Publication: Proceedings of the VI Świętokrzyskie Veterinary Medicine Meetings, 6–9, 2010. In Polish.

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Publication: Proceedings of the VI Świętokrzyskie Veterinary Medicine Meetings, 16–19, 2010. In Polish.

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Ref.: ECVO 2010 Annual Scientific Meeting, Berlin, 28–30 V 2010.
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Ref.: III Annual Biomaterials Meeting for Scandinavian Society for Biomaterials, Hafjell, Norway, 14–16 IV 2010.

Publication: Proceedings of III Annual Biomaterials Meeting for Scandinavian Society for Biomaterials, 18, 2010, In English.

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Ref.: XXIII European Conference on Biomaterials, Tampere, Finlandia, 11–15 IX 2010.

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Publication: Magazyn Wet. 19, 506-509, 2010. In Polish, summary in English.

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Publication: Weterynaria w Praktyce 7, 61-65, 2010. In Polish, summary in English.

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Publication: Weterynaria w Praktyce 7–8, 12–15, 2010. In Polish, summary in English.

LABORATORY OF VETERINARY RADIOLOGY AND ULTRASONOGRAPHY

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RESEARCH STUDIES (SUMMARIES)

Anna Łojarczyk-Szczepaniak, Anna Śmiech, Tomasz Wojnowski

CONGENITAL URACHAL DIVERTICULUM IN DOGS: A CASE REPORT

This study reports the case of a 4-year-old female Mastiff dog in which a congenital urachal diverticulum was diagnosed. The disorder was related with atypical clinical manifestations. The animal was referred for a radiological evaluation with the clinical signs of ataxia. The owner stated that the symptoms improved after each spontaneous micturition of a dog.

The radiological study revealed the presence of degenerative changes in the lumbosacral spine. Moreover, an abnormal shape of the urinary bladder in the abdominal cavity was observed. The ultrasound imaging showed a large diverticulum in the cranioventral part of bladder. The operative procedure and histopathological analyses have confirmed the presence of a urachal diverticulum. The clinical symptoms completely abated after the surgery.

Publication: Medycyna Wet. (Lublin), 66, 421–424, 2010, fig. 4, tab. 1. In English, summary in English.

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Ref.: EVDI Annual Scientific Conference, Giessen, Niemcy, 21–25 VII 2010.

Publication: EVDI Conference Guide & Abstracts, 128, 2010. In English.

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Ref.: EVDI Annual Scientific Conference, Giessen, Niemcy, 21–25 VII 2010.

Publication: *EVDI Conference Guide & Abstracts*, 100, 2010. In English.

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Publication: *Magazyn Wet.* 19, 347–351, 2010. In Polish, summary in English.

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Publication: *Magazyn Wet.* 19, 316–319, 2010. In Polish, summary in English.

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Publication: *Życie Wet.* 85, 989–992, 2010. In Polish, summary in English.

DEPARTMENT OF EPIZOOTIOLOGY AND CLINIC OF INFECTIOUS DISEASES

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Prof. ordin. Dr. habil. Krzysztof Kostro

RESEARCH STUDIES (SUMMARIES)

Lukasz Adaszek, Waldemar Kotowicz, Stanisław Winiarczyk

THE CASES OF HORSE PIROPLASMOSIS IN POLAND

Przypadki piroplazmozy u koni w Polsce

This paper describes two cases of piroplasmosis in horses in Poland. It was a 2 years old stallion with symptoms of fever, anemia, loss of appetite and muscle weakness, and 4 years old mare with symptoms of hematuria, fever, anemia. From the animals, the blood samples were collected for the standard hematological and biochemical examinations, serological and molecular tests for *Borrelia*, *Babesia/Theileria* spp. and *Ehrlichia/Anaplasma* spp.

The results of hematological examinations revealed low level of hematocrit, thrombocytopenia. In PCR reaction, with primers RIB 19, RIB 20, and RLBF2, RLBR2 the genetic material of *Babesia/Theileria* spp 18S RNA gene was detected. On the basis of molecular examination results and efficiency of imidocarb in a dose 2 ml/100 kg, the diagnosis of babesiosis in horse was established. Control PCR examination of the horse blood, taken 14 days after finished therapy didn't reveal the genetic material of piroplasms. Full recovery of the animal was observed.

Publication: Weterynaria w Praktyce 10, 90–92, 2010, fig. 2. In Polish, summary in English.

Lukasz Adaszek, Janina Łukaszewska, Marta Górna, Marcin Garbal,
Stanisław Winiarczyk

GRANULOCYTIC ANAPLASMOSIS IN HORSES

Anaplazmoza granulocytarna koni

The 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 by means of 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 in the GenBank. The treatment involved the intravenous application of oxytetracycline resulted in a gradual recovery.

Publication: Weterynaria w Praktyce 7, 84–87, 2010, fig. 4, tab. 1. In Polish, summary in English.

Lukasz Adaszek, Stanisław Winiarczyk

APPLICATION OF THE SYBR GREEN REAL-TIME HRM PCR TECHNIQUE IN THE DIFFERENTIATION OF THE *Babesia canis canis* PROTOZOA ISOLATED IN THE AREAS OF EASTERN POLAND

The aim of this study was to determine the usefulness of the Real-Time PCR HRM method in the differentiation of the *Babesia canis canis* protozoa isolated from dogs in the areas of eastern Poland. The studies involved 20 isolates of *Babesia canis canis* qualified depending on the analysis of the 18S RNA gene sequence to group A (EU 622792) and 20 isolates qualified to group B (EU 622793). It was proven with the Real-Time PCR technique that the melting temperature of the obtained products of amplification was 78°C for the representatives of group A and 81°C for the representatives of group B, which proves that the Real-Time Sybr Green HRM PCR method is a technique allowing for the differentiation of the *B. canis* isolates which are slightly different with respect to the genetic structure, without the necessity to carry out time-consuming studies, i.e. sequencing and RFLP.

Publication: Parasitol. Res. 106, 1253–1256, 2010, fig.2. In English, summary in English.

Łukasz Adaszek, Stanisław Winiarczyk, Janina Łukaszewska, Cornelia Heile

FELINE BABESIOSIS

Babesiose bei einer Katze

The study was aimed at determining the cause of a disease in a 10 year old queen cat with the symptoms of weakness, anemia, fever and hematuria. The hematological examination revealed anemia, thrombocytopenia and leukopenia. Blood smears showed merozoites in erythrocytes similar to *B. canis*. The PCR reaction detected genetic material of 18 SRNA (559 bp) of *Babesia* spp. which showed 87% homology with *Babesia felis* and 95% with *Babesia canis canis*. The therapy of the cat with imidocarb dipropionate resulted of fully recovery of the animal. Based on the results of hematological and molecular examinations and the efficiency of the therapy we could ascertain, that this was the first case of *Babesia* infection in a cat in Poland.

Publication: Kleintierpraxis 55, 624–628, 2010, fig. 2, tab. 2. In German, summary in English.

Przemysław Dudko, Krzysztof Kostro, Maciej Kurpisz

ADAPTATION MICROSTIX-CANDIDA SIDLE-TEST FOR DIAGNOSIS OF BOVINE MASTITIS DUE TO ANASCOGENIC YEASTS

Although a large diversity of mastitis-causing bacteria (150 species, subspecies or biovars) have been documented, an adequate and simple mycological screening for yeast-related mastitis has not been developed. Since yeast incubation normally lasts longer than the majority of bacteriological ones, usually a treatment is administered before the results of microbial cultures are obtained. Therefore, a simple test has been needed for detection of yeast-related mastitis, the results of which can be read in parallel to bacteriological screening. Application of Microstix®-Candida assay was first checked for its specificity in standard *Candida albicans* (Oxford strain) cultures (phase I) and then in the other 36 strains of yeasts isolated from clinical mastitis cases during field investigations (second phase). Next, a test was implemented for identification of pathogens in 9 cohorts (1,200 cows) from red-white Polish-Friesian breed in which the dynamics of mastitis were traced by bacteriological and mycological assays along year-long observations. The data obtained showed that apart from frequent infections (~50–70%) proved by using pure microbial cultures, also mixed (bacterial-fungal) infections (0–25%) appeared as well as negative sieves (in the range of 0–45%). Mycological assays revealed a significant fraction of mixed infections during both lactation and the dry period. Strepto-staphylococcal infection was

thus identified, however, its proportion strongly decreased after the introduction of antibiotics (after sensitivity to microbial agents was determined). Microbial monitoring was improved in these herds by parallel application of bacteriological and mycological (particularly Microstix®-Candida) tests. Microstix®-assay appears to be useful for mycological diagnosis in field conditions of infected (mastitis) herds. Its advantages include easy performance and short incubation time that is only 24 h at 37°C (72–96 h at room temperature). This allowed demonstrating the cow's udder yeast infection simultaneously with the first reading of bacterial cultures. Its specificity was confirmed against standard Candida Oxford strain, and sensitivity (100%) was confirmed in mycological cultures (36 strains) and biochemical assays.

Publication: Acta Vet. Brno 79, 113-120, 2010, fig. 3. In English, summary in English.

Zbigniew Grądzki, Liliana Boguta

**GENOTYPING OF BACTERIA ISOLATED FROM NASAL MUCOSA
OF THE UPPER RESPIRATORY TRACT OF HORSES**

Właściwości genotypowe bakterii izolowanych z błony śluzowej górnych dróg oddechowych koni

The aim of the study was to compare genetic profiles of selected bacterial groups isolated from nasal mucosa of horses with upper respiratory tract infections. The RAPD method with the use of commercial test (Ready-To-Go RAPD Analysis Kit, Amersham Pharmacia Biotech, USA) was used in the study. The representative group of bacterial strains isolated from different horse farms in our earlier studies was subjected to the analysis of the genetic polymorphism. All isolates were preliminary phenotypically characterized. Totally 26 strains of *Staphylococcus xylosus*, 25 strains of *Staphylococcus sciuri*, 7 strains of *Staphylococcus lentus* and 15 strains of *Bordetella bronchiseptica* were examined. The biggest genetic differentiation was shown within the strains of *St. lentus* species in which 4 different RAPD patterns within 7 strains examined was found (57,1%). In other bacterial species polymorphism of 40%, 53,8% and 26,7% was found in case of *St. sciuri*, *St. xylosus* and *B. bronchiseptica* respectively. The results showed prominent genetic differentiation within coagulase-negative staphylococci isolated from horses, mainly in *St. xylosus* species. They presented also different biochemical properties. On the contrary, *B. bronchiseptica* strains constituted relatively uniform bacterial group both from the genetic point of view as well as based on the phenotypic properties.

Publication: Medycyna Wet. (Lublin), 66, 121–126, 2010, fig. 4, tab. 1. In Polish, summary in English.

Krzysztof Kostro, Dariusz Bednarek, Roman Aleksiewicz, Łukasz Jarosz,
Urszula Lisiecka, Andrzej Żmuda, Paweł Wojtaszczyk

**SERUM AMYLOID A CONCENTRATIONS
AND LYSOZYME BACTERIOLYTIC ACTIVITY
IN THE SERUM OF STEEP WITH NATURAL ZEARELENOSIS**

The aim of the study was to assess bacteriolytic activity of lysozyme and serum amyloid A (SAA) level in sheep affected with zearalenone mycotoxicosis. Bacteriolytic activity of lysozyme, and serum amyloid A (SAA) level are both the elements of innate humoral immunity.

Lysozyme bacteriolytic activity in serum was determined by diffusion-plate method with reference to *Micrococcus luteus*. SAA concentration was determined by the use of commercial ELISA kit (Phase Serum Amyloid A Assai TP802). The highest lysozyme bacteriolytic activity was observed in sheep with total rectal and intestinal mucosal membrane prolapse. Lysozyme concentration values in animals with partial rectal prolapse were significantly lower. In the control group, lysozyme concentration was low and within the range considered as physiologically normal. The highest levels of SAA, which ranged from 38.5 to 172 $\mu\text{g/mL}$, were detected in sheep in which the highest lysozyme bacteriolytic activity was noted. From the data obtained, it is undoubtful that changes in SAA level in affected sheep and control sheep are reliable indicators of zearalenone mycotoxicosis progress and termination. The highest levels of SAA were noted in animals, which had the total rectal and intestinal prolapse in course of zearalenone mycotoxicosis, and after returning the rectum to the normal position, mucosal membrane necrosis occurred, which resulted in perforation and peritoneum inflammation.

The observed differences in SAA level forming range in particular animals from infected group are conditioned by the character of inflammation process and intensity in organs altered by the disease, which are principal factors inducing changes in its concentration. The level of this protein in serum reflects activation state of immunological system and could be one of the criterions in sheep health assessment.

Publication: Bull. Vet. Inst. Pulawy 54, 383–388, 2010, fig. 3, tab. 2. In English, summary in English.

Katarzyna Surma-Kurusiewicz, Stanisław Winiarczyk, Łukasz Adaszek

**EQUINE ARTERITIS VIRUS SEROEPIDEMIOLOGICAL INVESTIGATIONS
IN AREA OF EASTERN POLAND, UTILITY OF CLASSICAL SN ASSAY
AND ELISA TEST IN A DIAGNOSE OF THE DISEASE**

Badania seroepidemiologiczne w kierunku wirusowego zapalenia tętnic koni
na terenie wschodniej Polski z wykorzystaniem odczynu seroneutralizacji i testu ELISA

The aim of this study was to estimate the prevalence of equine arteritis virus infections in horses coming from the area of eastern Poland utilized SN assay and ELISA test in a diagnose of equine arteritis. Sera of 442 horses were examined. In SN assay the antibodies against EAV were detected in 185 probes with the titer range 1:8 to 1:512. All sera probes examined by SN test were analyzed again by ELISA test. In this study positive reactions were observed for 136 out of 442 examined probes. Sera of 10 horses, which were negative in SN assay, gave positive reaction in ELISA. On the other hand 59 sera negative in ELISA test were positive in SN assay with the titer ranged 1:8 or higher. The ELISA test detected 49 seropositive animal less than SN assay. The statistical analysis of the results of this study shows that the ELISA test compared wit SN assay have the 68,1% sensitivity and 96,1% specificity respectively.

Publication: Medycyna Wet. (Lublin) 11, 774–777, 2010, tab. 3. In Polish, summary in English.

Anna Ziętek-Barszcz, Zbigniew Grądzki

**THE SUITABILITY OF SELECTED METHODS OF NUCLEIC ACID EXTRACTION
FOR DETECTING *Rhodococcus equi* DNA
IN TRACHEOBRONCHIAL WASH FLUID USING PCR**

Przydatność wybranych metod ekstrakcji DNA do wykrywania *Rhodococcus equi*
w popłuczynie tchawiczo-oskrzelowej żrebiąt metodą PCR

The aim of the study was to evaluate the suitability of selected methods of nucleic acid extraction for detection of *R. equi* DNA in tracheobronchial wash fluid using PCR. The material for the study consisted of samples of tracheobronchial wash fluid from foals aged 1–6 months from a stud free of *R. equi* pneumonia and a suspension of the reference strain *Rhodococcus equi* ATCC 33701. To collect the tracheobronchial wash fluid from the foals, a modification of Hashikura's nasotrachial aspiration method was used. The culture of the *Rhodococcus equi* reference strain was titrated using the surface plate method according to Koch. Initially a pooled sample was prepared, consisting of 10 samples of tracheobronchial wash fluid taken from different foals. Then 100 µl of the bacterial suspension (*R. equi* ATCC 33701), containing a determined

concentration of bacteria (10^5 , 10^4 , 10^3 , $5 \cdot 10^2$, 10^2 and 10 cells) from the titrated culture of the *R. equi* reference strain, was added to 1.0-ml portions of the pooled sample. The following methods were used for DNA extraction: enzyme digestion using lysostaphin, lysozyme and proteinase K; digestion with lysozyme and proteinase K using the cationic detergent CTAB; and a silica membrane-based commercial kit for isolating DNA from biological material. Oligonucleotides used as PCR primers were selected based on data from the literature. The primer pair Rq1 and Rq2 was used, which was complementary to the conservative gene-fragment encoding the 16S subunit of the ribosomal RNA of *R. equi*. The sensitivity threshold of the PCR reaction for detecting *R. equi* DNA was determined for the liquid culture of the reference strain (ATCC 33701) in LB medium and for the tracheobronchial wash fluid with determined concentrations of the bacteria. It can be seen from the obtained results that the traditional enzyme digestion methods used with the tracheobronchial wash fluid are more sensitive than the commercial DNA isolation kit. When DNA extracted from the tracheobronchial wash fluid using the enzymatic digestion methods was used as a template for PCR, a positive result was obtained for the samples containing at least 100 bacterial cells. The sensitivity threshold determined for this material was identical to that obtained using the same methods with the liquid culture of the reference strain of *R. equi*. Where the commercial kit was used (QIAamp DNA Mini Kit, Qiagen), a positive result for the PCR reaction was obtained when the bacterial concentration in the sample was at least 500 cells, irrespective of the type of material the DNA was extracted from.

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DEPARTMENT OF FOOD HYGIENE OF ANIMAL ORIGIN

Akademicka 12, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Zbigniew Belkot, Arkadiusz Chudzik

ECONOMIC GAINS OR LOSSES RESULTING FROM THE CHILLING OF POULTRY

Zyski lub straty ekonomiczne jako wynik chłodzenia drobiu

The aim of the reasearch was to evaluate gains and losses to producers and consumers of poultry which result from the application of diverse methods of chilling poultry carcasses.

The research was carried out on 120 carcasses of slaughter chickens chilled by three different systems, i.e. air chilling, immersion chilling and evaporative chilling, 40 carcasses from each system. Weight losses or gains of the carcasses before and after chilling were initially established by the so-called plant method. The weight was measured directly after gutting and the removal of giblets and fat, but before the first washing. Each carcass was weighed to an accuracy of one gram. Then the carcasses were hanged again on the slaughter line, where they underwent the processes of washing, chilling and draining. Following the above, the carcasses were weighed for the second time. The following parameters were calculated: the average weight gain or loss of the carcass after chilling (g/carcass); the average weight gain or loss of the carcass after chilling (g/kg); the relative weight gain or loss of the carcass after chilling (%). Next, the chilling systems under examination were evaluated in terms of economic gains or losses to the poultry plant and the poultry consumer. Economic analysis involved the following indicators: the gain or loss to the plant during processing (PLN/carcass); the yearly gain or loss to the plant during chilling (PLN); the gain or loss to the plant during chilling (PLN/kg of sales); the gain or loss to the consumer resulting from chilling (PLN/kg purchased); the yearly gain or loss to

the consumer; the yearly gain or loss to the social budget resulting from the choice of a specific chilling method and the yearly slaughter of chickens

It was found that the carcass weight after chilling varied significantly depending on the chilling method applied. The air chilling system reduced the carcass weight on average by 2.31%. The other two chilling methods caused an increase in the carcass weight, which was greater in the immersion system: on average by 3.45%. Also the evaporative system caused the carcass weight to grow but to a lesser extent than the immersion one: on average by 2.63%. The immersion chilling proves the most profitable to the producer. This method produces the greatest gains in the carcass weight, consisting mainly in increased free water content in meat. The plant gains 0.20 PLN per 1 kg of meat, but the yearly gain amounts to as much as 3,449,605 PLN. The evaporative system is also profitable to the producer but the economic gain is somewhat smaller than in the immersion system. From the producer's point of view the least desirable is chilling by air since, in comparison with the other two systems, the producer loses 2,950,899 PLN a year. By contrast, air chilling is the most favourable to the consumer. He gains 0.17 PLN per 1 kg of chicken meat purchased. Considering the yearly consumption of chicken meat, an individual consumer gains 4.50 PLN but the yearly gain from this method of chilling to entire society amounts to 203,910,000 PLN. The application of the other two chilling methods results in considerable losses to the social budget, which are especially high in the case of the immersion method.

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Waldemar Paszkiewicz, Renata Pyz-Lukasik

**BACTERIAL CONTAMINATION OF CARCASS SURFACES
IN RELATION TO THE ORDER OF SLAUGHTERING CATTLE**

Zanieczyszczenie bakteryjne powierzchni tusz wołowych w zależności od kolejności ubijanego bydła

The aim of the study was to evaluate the bacterial contamination of beef carcass surfaces in relation to the order of slaughtering cattle during a slaughter day. The research was conducted on carcasses from a slaughterhouse approved to produce for the market. The daily average number of cattle slaughtered in the facility was 237. For the purpose of determining the total count of aerobic bacteria, bacteria from the Enterobacteriaceae family and Enterococci, 40 carcasses were examined (8 per each working day), whereas 50 carcasses (10 per each working day) were used to detect the presence of Salmonella rods. The microbiological denotation of particular bacterial groups was conducted according to

the relevant Polish Standards. Samples for examination were collected by the destructive technique and swabbing (with sterile swabs) from the rump, neck, plate and chuck of carcasses before chilling, in accordance with the Polish Standards. It was found that the order of slaughtering cattle during a slaughter day had no significant influence on the total bacterial count on the examined carcass surfaces. The total count of aerobic bacteria in beef carcasses ranged from $1.8 \cdot 10^2$ cfu/cm² (2.26 log cfu/cm²), at the first stage of the slaughter process, to $5.9 \cdot 10^2$ cfu/cm² (2.77 log cfu/cm²), at the third stage of the slaughter process. In most cases no relationship was observed between the total bacterial count and the day of the week on which the examination took place. The daily log mean value of contamination fell within the range of $3.5 \cdot 10^2$ (2.55 log cfu/cm²) to $8.3 \cdot 10^2$ cfu/cm² (2.92 log cfu/cm²). Only on the third working day the total aerobic count was found to be significantly lower ($8.7 \cdot 10^1$ cfu/cm² – 1.94 log cfu/cm²) than on the fourth day. The values determined were lower than the hygienic standards for the slaughter process set in Commission Regulation (EC) No. 2073/2005 by about 1 to 0.4 log (and as much as 1.4 log on the third working day), respectively. The bacteria from the Enterobacteriaceae family were found in 23% of samples examined and Enterococci in 45%. Contamination with the above bacteria was insignificant as it did not exceed 8 cfu/cm² for Enterobacteriaceae and $3.2 \cdot 10^1$ cfu/cm² for Enterococci. None of the samples examined was found to be contaminated with *Salmonella* rods.

Neither the order of slaughtering cattle during a slaughter day nor the day of the week on which the examination took place affected the total bacterial contamination of carcasses. The standard of sanitary supervision in the slaughterhouse was good.

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Greta Skrzypek, Zygmunt Nowakowski

**INTENSITY OF *Trichinella spiralis* INVASION
IN THE MUSCLES OF EXPERIMENTALLY INFECTED RABBITS**

Intensywność inwazji *Trichinella spiralis* w mięśniach doświadczalnie zarażonych królików

Research concerning the distribution as well as intensity of *Trichinella* larvae in the bodies of hosts is crucial from the perspective of the invasionology and diagnostics of Trichinellosis. Diagnosing *Trichinella spiralis* is dependent on the following factors: intensity of *Trichinella spiralis* invasion in the muscles, the weight of the material, the specific types of muscles, animal species, as well as

the method of testing for Trichinellosis presence. The goal of the authors' study was determining the distribution and intensity of *Trichinella spiralis* larvae invasion in selected rabbit muscles experimentally infected with a small dose of Trichinella. The investigations were conducted on 8 healthy slaughter rabbits that weighed 5 kg. The rabbits were infected with a single dose of 90 *Trichinella spiralis* muscle invasive larvae derived from a boar. The rabbits were slaughtered 60 days after infection. Select entire muscles from the left and right sides of the carcasses were chosen for investigation. From rabbit the following muscles were tested for Trichinellosis presence: Diaphragma (part: lumbalis, costalis, sternalis), *m. masseter*, *antebrachii*, *tongue*, *m. biceps brachii*, *pterygoideus*, *cruris*, *mm. intercostales*, *m. semitendinosus* and *semimembranosus*, as well as *m. longissimus lumborum*. The distribution as well as intensity of the *T. spiralis* larvae invasion (trichinellosis count per 1 g of muscle, as well as percentage in relation to the diaphragm = 100%) in the investigated muscles was determined by the digested method according to Commission Directive (WE) no. 2075 as of December 5, 2005.

All the rabbits used in the experiment were infected: encysted *T. spiralis* larvae were confirmed in all the examined muscles. The results of the conducted investigations showed statistically significant differences in the *T. spiralis* invasion of specific muscles. The greatest trichinellosis larvae invasion occurred in the *m. masseter*, *antebrachii* and in the diaphragm. The intensity of the *T. spiralis* invasion in the examined muscles was 18.92 to 1.20 per 1 g of muscle and was from 1.08 to 17.13 times less than the trichinellosis invasion in the *m. masseter*. These results indicate the high suitability of the *m. masseter* for investigating the presence of trichinellosis in rabbits. Rabbits are susceptible to *T. spiralis* infection. The trichinellosis larvae undergo encystment in their muscles. The muscle tissue of all rabbits infected with *T. spiralis* was brought on by rat trichinellosis.

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Krzysztof Szkucik, Monika Ziomek

VARIATION IN THE FATTY ACID PROFILE AS RELATED TO THE TYPE OF FAT AND THE RABBIT BREED

Zmienność profilu kwasów tłuszczowych w zależności od rodzaju tłuszczu i rasy królików

The aim of the research was to determine the variation in the fatty acid profile of rabbit fat as related to the fat location in the carcass and the breed of the animal. Research material consisted of samples of subcutaneous fat from the scapular area, perirenal fat and intramuscular fat from thigh and scapular mus-

cles collected from carcasses of 30 meat breed rabbits and 30 crossbreeds. Both groups of rabbits (females) were bred in small farms during summer and fed mainly with green fodder and root crops supplemented with ground barley and a small quantity of hay. Fatty acid composition was determined with a Varian CP 3800 gas chromatograph. The comparison of fatty acid profiles of the intramuscular, perirenal and subcutaneous fat of the meat breed rabbits revealed that intramuscular fat was characterized by higher contents of stearic acid (C18:0) and polyunsaturated fatty acids (PUFA) with the exception of linoleic acid (C18:3). Perirenal fat was characterized by higher contents of tetradecanoic acid (C14:1) and linoleic acid (C18:2), whereas the content of palmitoleic acid (C16:1) was the highest in subcutaneous fat. Intramuscular fat of crossbreeds was characterized by the highest content of palmitic acid (C16:0), whereas the quantity of linoleic acid (C18:2) was significantly higher in perirenal fat. Despite differences in the content of the above-mentioned fatty acids, total amounts of saturated fatty acids (SFA), monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA) in all types of fat examined and in both groups of rabbits were comparable. Generally, lipids of crossbreeds were characterized by a lower percentage of SFA and a higher percentage of PUFA, including mainly linoleic acid (C18:3), in comparison with the meat breed. These lipids also demonstrated better SFA/UFA and PUFA/MUFA ratios. Moreover, the fat of crossbreeds was characterized by a highly favourable n-6/n-3 fatty acid ratio. The research findings suggest that rabbit fat, especially the fat of crossbreeds, is a rich source of polyunsaturated fatty acids, including NNKT, and their mutual proportions are close to dietary recommendations.

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Ref.: Conference "Trichinella and trichinellosis – current situation". Puławy, 23–24 IX 2010.

Publication: Proceedings of International Scientific Conference "Trichinella and trichinellosis – current situation", 52–53, 2010. In Polish.

PEŁCZYŃSKA E., LIBELT K.: Nutritive value of mechanically separated meat of goose. (Wartość biologiczna mechanicznie odkostnionego mięsa gęsi).

Ref.: Conference "Progress in meat technology". Warsaw, 13 V 2010.

Publication: *Proceedings of the Scientific-Technical Conference "Progress in meat technology", 49–50, 2010. In Polish.*

PASZKIEWICZ W., PYZ-LUKASIK R.: Level of bacterial contamination of calf carcasses in relation to the stage of slaughter day. (Poziom zanieczyszczenia tusz cielęcych w zależności od etapu dnia ubojowego).

Ref.: Conference "Progress in meat technology". Warsaw, 13 V 2010.

Publication: *Proceedings of the Scientific-Technical Conference "Progress in meat technology", 51–52, 2010. In Polish.*

SZKUCIK K., PISARSKI R.: Influence of herbs substituting on fatty acid profile in intramuscular fat of broiler chickens. (Wpływ dodatku ziół na profil kwasów tłuszczowych w tłuszczu śródmięśniowym kurcząt brojlerów).

Ref.: Conference "Progress in meat technology". Warsaw, 13 V 2010.

Publication: *Proceedings of the Scientific-Technical Conference "Progress in meat technology", 54–56, 2010. In Polish.*

DEPARTMENT OF PATHOLOGICAL ANATOMY

Głęboka 30, Lublin

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RESEARCH STUDIES (SUMMARIES)

Krzysztof Bańka, Grzegorz Buszewicz, Piotr Listos, Roman Mądro

USEFULNESS OF GC-MS METHOD FOR THE DETERMINATION OF DDT, DMDT, AND Y-HCH IN BEES (BODIES) FOR LEGAL PURPOSES

The paper contains the description of mass poisoning of honey bees and the method used to determine dichlorodiphenyltrichloroethane, methoxychlor, and lindane in the insects. The ultrasound-aided extraction of pesticides from dead bees was conducted using dichloromethane and the analysis of the extracts was conducted using gas chromatography-mass spectrometry. The whole procedure was validated.

Publication: Bull. Vet. Inst. Pulawy 54, 655–659, 2010, fig. 3, tab. 1. In English, summary in English.

Hanna Bis-Wencel, Wojciech Łopuszyński, Leon Saba, Monika Bryl,
Agnieszka Rowicka

HISTOPATHOLOGICAL EXAMINATION OF SELECTED INTERNAL ORGANS OF PASTEL MINKS IN RELATION TO OXIDATIVE STATE PARAMETERS

The aim of the study was histopathological characteristics of mink females showing a tendency to decrease body condition in a perinatal period against a background of selected parameters of antioxidant state. The minks were divided into two groups according to body condition scoring system (BCS). The blood was collected twice: after weaning and at the end of the production cycle. The

serum activity of oxidative state enzymes was determined. Anatomic and histopathological examinations were conducted after the production cycle. Samples of the liver, kidneys, small intestine, and ovaries were fixed in 10% buffered formalin and stained with haematoxylin-eosin and Sudan IV. The histopathological examinations revealed hyperaemia of the liver and kidneys, with large content of blood in the capillary and central vessels of obese females. The kidneys structure was normal in animals of experimental group. On the other hand, kidneys of control group animals showed degenerative changes in the epithelial cells of the tubules of the excretory part, especially of the proximal tubules. Against the background of the obtained results, it should be stated that lower activities of selected enzymes with anatomical and histopathological changes were obtained in the animals with worse body condition.

Publication: Bull. Vet. Inst. Pulawy 54, 65–1654, 2010, fig. 3, tab. 1. In English, summary in English.

Wojciech Łopuszyński, Marek Szczubiał, Renata Komsta

PROGNOSTIC STATUS OF P53 PROTEIN ACCUMULATION IN CANINE MALIGNANT MAMMARY TUMOURS

The expression of p53 protein was determined by the immunohistochemical study with CM-1 polyclonal antibody. The investigations were performed on formalin-fixed and paraffin-embedded tissue samples of mammary tumours obtained from 131 bitches during surgery. The p53 protein accumulation was detected in 37 tumours (28.24%). No correlation was found between p53 protein overexpression and histological type, tumour size, or regional lymph node status. However, its relationship with a histologic malignant grade approached statistical significance ($P = 0.067$). After the 24-month follow-up period, survival analysis revealed a shortened disease-free survival and overall survival time of the dogs with tumours, which overexpressed p53 protein. Only in the case of survival time, the difference was close to the borderline of statistical significance ($P = 0.061$).

The research data presented herein, being not fully explicit, have indicated a correlation of p53 protein accumulation with worse prognosis in canine mammary tumours, although the results do not allow recognising p53 protein accumulation as a suitable prognostic factor.

Publication: Bull. Vet. Inst. Pulawy 54, 105–111, 2010, fig. 6, tab. 3. In English, summary in English.

Jacek Piórkowski, Zbigniew Nozdryn-Plotnicki, Piotr Listos

**EVALUATION OF PATHOMORPHOLOGICAL SPLENIC LESIONS
IN DOGS FROM THE LUBLIN REGION IN 2005–2008**

The study aimed at the analysis of splenic pathologic lesions in mix-breed dogs of varied age and sex in the Lublin Province in 2005–2008. The research material comprised 33 spleen specimens collected both during surgery and post mortem. The material was fixed in 4% buffered formalin, dehydrated, and paraffin-embedded. The 4- μ m-thick sections were stained with haematoxylin and eosin. The non-cancerous lesions were detected in young dogs under 2 years of age. Angiosarcoma proved to be the most common lesion and accounted for over 36% of total cases, followed by haemangioma recognised in above 27% of all cases. Nodular hyperplasia, hyperaemia, histiocytic sarcomas, haemangiopericytomas, lymphomas, and necrotic lesions were observed in notable minority of cases.

Publication: Bull. Vet. Inst. Pulawy 54, 243–246, 2010, fig. 2, tab. 1. In English, summary in English.

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LISTOS P., NOZDRYN-PLOTNICKI Z., PIÓRKOWSKI J., SOKOŁOWSKI A.: Post mortem estimation the time of death using the measurements of the rectal temperature in comparison with the temperature in muscles. (Badania nad ochładzaniem zwłok zwierząt w aspekcie ustalania czasu śmierci – pośmiertny spadek temperatury w mięśniach i odbytnicy).

Ref. XV Meeting of Polish Society of Forensic Toxicology. Gdańsk, 16–18 IX 2010.

Publication: Proceedings of the XV Meeting of Polish Society of Forensic Medicine and Kryminology, 40, 2010. In Polish.

LISTOS P., NOZDRYN-PLOTNICKI Z.: Veterinary-law opinions in death poisonings in animals. (Prawno-weterynaryjna ocena zatruc śmiertelnych u zwierząt).

Ref. VII Scientific Festival in Lublin, 18–24 IX 2010.

Publication: Proceedings of the VII Scientific Festival in Lublin, UP 070, 2010. In Polish.

ŁOPUSZYŃSKI W., LASIECKA K., ŚMIECH A., SZCZUBIAŁ M.: Predictive value of topoisomerase-II alpha expression in mammary gland tumors in female dogs.

Ref. XXVIII Meeting of the European Society of Veterinary Pathology and European College of Veterinary Pathologists ESVP/ECVP, Belgrade, Serbia, 8–11 IX 2010.

Publication: Book of Abstracts – Belgrade: Serbian Society of Veterinary Pathology 65, 2010. In English.

PIÓRKOWSKI J.: Estimation of pathomorphological changes in animals. (Ocena zmian chorobowych tkanek u zwierząt).

Publication: Proceedings of the VII Scientific Festival in Lublin, UP 061, 2010. In Polish

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Publication: Życie Wet., 85, 601–603, 2010. In Polish.

LISTOS P.: Job responsibility in the veterinary profession – genesis of the cases and problems with judgement. (Odpowiedzialność zawodowa lekarzy weterynarii – geneza spraw oraz problematyka związana z orzecznictwem).

Publication: Wet. Prakt. 7, 7–8, 8-10, 2010. In Polish.

DEPARTMENT OF PRECLINICAL VETERINARY SCIENCE

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Dr. habil. Urszula Kosior-Korzecka

RESEARCH STUDIES (SUMMARIES)

Joanna Wessely-Szponder , Kamila Kloc

THE INFLUENCE OF ISOPRIVET ON NEUTROPHIL SECRETORY ACTION IN THE COURSE OF BRD IN CALVES

Bovine respiratory disease (BRD) is a multifactorial disease, which causes major economical losses in the cattle farms. Neutrophils play a role in the host defence but during prolonged or excessive inflammation they are destructive for lung tissues. The excessive degranulation with release of among others elastase, myeloperoxidase, and nitric oxide causes lung injury during BRD in calves. The purpose of the study was to investigate the influence of different doses (from 50 to 1000 µg/ml) of isoprinosine (Isoprivet) on the secretory action of neutrophils isolated from calves suffering from BRD. Neutrophil degranulation was assessed by elastase and MPO release, and NO generation. The elastase release in the group of BRD calves was greater than in healthy calves. The highest level was obtained at the concentration of 1000 µg/ml, and for BRD calves was 98.7 ±2.39%. MPO release was initially inhibited by low doses of Isoprivet. At the highest concentration of Isoprivet the maximal release was observed in the cul-

tures of neutrophils from both studied groups of calves. Generation of NO by neutrophils from healthy calves increased along with growing concentration of Isoprivet (from the value of 1.28 μM of nitrite in the neutrophil culture without stimulation to $7.2 \pm 4.79 \mu\text{M}$ at 1000 $\mu\text{g/ml}$). Whereas in the group of BRD calves the inconsiderable decrease of NO production by neutrophils at concentration of 50–500 $\mu\text{g/ml}$ of Isoprivet was observed. The distinct increase of NO generation was revealed only in response to the highest concentration of Isoprivet ($12.74 \pm 12.53 \mu\text{M}$). Thus Isoprivet in low doses had no significant effect on neutrophil secretion or slightly inhibited it. In higher doses this preparation causes excessive release of enzymes and generation of free radicals which may cause lung injury and worsening the course of disease.

Publication: EJPAU 13(4), 2010, fig. 3. In English, summary in English.

Joanna Wessely-Szponder, Barbara Majer-Dziedzic B, Anna Smolira

ANALYSIS OF ANTIMICROBIAL PEPTIDES FROM PORCINE NEUTROPHILS

Cationic host defence peptides are important components of innate immunity in pigs and other mammals. Most of these peptides have a direct antimicrobial activity and they also have a broad spectrum of effects on the host immune system, which may be taken into account in the introduction of novel therapeutics. Our method permits simultaneous isolation of six antibacterial peptides, i.e. prophenin-1, prophenin-2, PR-39, and protegrins 1-3 from a porcine neutrophil crude extract and characterisation of them. Among the obtained peptides the greatest bactericidal activity expressed as MBC was seen in protegrins (10 $\mu\text{g/ml}$), whereas in the other studied peptides MBC was on the level of 20 $\mu\text{g/ml}$. Minimal inhibitory concentrations (MIC) reached 10 $\mu\text{g/ml}$ for protegrins 1-3 and 20 $\mu\text{g/ml}$ for prophenins, and PR-39. Within the bactericidal range all isolated peptides didn't show cytotoxicity on cell lines used in our experiment.

Publication: J. Microbiol. Meth. 83, 8–12, 2010, fig. 5. In English, summary in English.

Joanna Wessely-Szponder, Tomasz Szponder

COMPARISON OF THE EFFECTS OF TWO ANAESTHETIC COMBINATIONS IN RABBITS ON SOME NEUTROPHIL FUNCTIONS *IN VITRO*

Tissue injury during surgery as well as anaesthesia can lead to modulation of neutrophil function. The aim of this study was to assess how two types of anaesthesia, i.e. combination of ketamine/midazolam/propofol (group I) and ketamine/ propofol (group II) influence on neutrophil function during and 24 h

after operation in rabbits. Blood samples were taken: Before anaesthesia, at 30 and 60 min, and 24 h after start of the experiment. At these time points degranulation and free radical generation were assessed in both groups. After 30 min of anaesthesia we observed decrease of elastase release from 50.9 ± 0.71 to $26.5 \pm 4.85\%$ in group I and from 51.0 ± 0.7 to $41.0 \pm 5.48\%$ in group II, respectively. In further measurements the elastase level increased to values lower than before starting of anaesthesia. The myeloperoxidase (MPO) release decreased significantly after 30 min of anaesthesia in group I, and then increased to the value similar to the pre-anaesthetic level after 60 min. MPO level in group II also decreased after 30 min but to a lesser degree, and then after 1 h MPO slightly exceeded the pre-anaesthetic level. In both groups 24 hours after start of anaesthesia obtained values decreased but maintained at a level higher than at the time before anaesthesia. We observed decrease of alkaline phosphatase (ALKP) level in both studied groups after 30 min of anaesthesia (from 24.77 ± 5.9 to $15.7 \pm 2.1\%$ and from 23.6 ± 1.14 to $10.6 \pm 0.89\%$, in groups I and II, respectively), with following increase after 60 min. In group I we observed significant ($p < 0.01$) decrease of NO production 30 min after start of anaesthesia. After increasing to the pre-anaesthetic level, the NO level was nearly constant in both further measurements. In group II NO level decreased 30 min after start of anaesthesia and then increased reaching a slightly higher level than at start of anaesthesia. The superoxide generation by neutrophils from rabbits of both groups decreased after 30 min of anaesthesia and then rose. Because used anaesthetic combinations alter neutrophil function only transiently both of them would be applied in surgery in rabbits without the risk of disturbance of healing process.

Publication: World Rabbit Sci. 18, 169–177, 2010, fig. 5. In English, summary in English.

Marta Wójcik, Urszula Kosior-Korzecka, Ryszard Bobowiec

CONTRIBUTION L+ AND D-LACTIC ACID TO METABOLIC ACIDOSIS DURING NEONATAL CALF DIARRHEA

Neonatal calf diarrhea is often complicated by lactic acidosis. There are two sources of endogenously produced lactic acid (LA), namely L- and D-LA. Both forms of this metabolite are preferentially generated in the muscles and alimentary tract respectively. Because there are discrepancy about participation of the both forms of LA in development of acidosis in young calves we sought to establish the degree of these two optical enantiomers contribution to acidosis in affected animals. To determine particular involvement of each LA isoform in the acid-base disturbances, we used HPLC method with chiral column which permits both accurately separate and quantify the analysed enantiomers. Moreover, to

characterize the origin and importance of this kind of metabolic acidosis, the anion gap was calculated. Calves (n = 29) fed with milk replacer (composition: concentrate of soybean protein, dry sweet whey, vegetal lipids, vitamins mixture, bioactive compounds, calcium formate, probiotics) were divided into three groups: I – healthy calves (control), II – affected calves with mild course of diarrhea and III – calves with severe forms of diarrhea. In the control group of calves, blood pH averaged 7.44 ± 0.02 . In the other groups, concomitantly with progress of clinical signs of diarrhea, the pH value systematically decreased. Both diarrhoeic groups of calves demonstrated higher value of anion gap in comparison to healthy animals (14.06 ± 2.25 mEq/l). However, only in third group of calves AG elevated significantly ($p \leq 0.05$) to 27.03 ± 1.26 mEq/l. Among two isoforms of LA present in serum, D(+) enantiomer dominated only in diarrhoeic groups of animals. During mild as well as severe course of diarrhea, D-LA concentration markedly increased to 1.82 ± 0.54 and 4.74 ± 1.89 mM/l respectively. In calves with severe form of diarrhea there was high positive correlation between D-LA serum level and anion gap ($r = 0.722$).

Publication: Medycyna Wet. (Lublin) 66, 547–550, 2010, fig. 4, tab. 2. In English, summary in English.

Marta Wójcik, Urszula Kosior-Korzecka, Ryszard Bobowiec

CYTOPROTECTIVE ACTION OF 17 β -OESTRADIOL AGAINST IRON-INDUCED HEPATIC OXIDATIVE STRESS *IN VITRO*

The objective of this study was to analyse the response of hepatocytes on various concentrations of 17 β -oestradiol (17 β -E) under iron-induced oxidative stress *in vitro*. Isolated, by *in situ* collagenase perfusion, hepatocytes were cultured in DMEM/HAMS-12 (v/v) medium without any additional agents (control), with Fe³⁺ alone and with Fe³⁺ and 0.2%, 0.02% and 0.002% solution of 17 β -E (17 β -EI, 17 β -EII and 17 β -EIII respectively). After 24, 48, 72 h medium malonyldialdehyde (MDA), haptoglobin (Hpt) concentration and proliferative activity were determined. In comparison to control as well as to samples collected at 24 and 72 h, hepatocytes exposition on Fe³⁺, caused ($P \leq 0.05$) increase of MDA (0.056 ± 0.011 nM/ml) only after 48 h of incubation. Each of 17 β -E solution resulted in decrease of MDA in samples obtained after 24 and 48 h. Comparison to the first 24 h, Fe³⁺ alone and together with 17 β -EI, 17 β -EII and 17 β -EIII caused ($P \leq 0.05$) augmentation of Hpt level in 48 h and 72 h of experiment. Each of 17 β -E, added to the culture medium resulted in inhibition of hepatic proliferative activity, especially in 72 h of cell incubation.

Publication: Bull. Vet. Inst. Pulawy 54, 259–263, 2010, fig.4. In English, summary in English.

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MARKOWSKA M.: Activity of neutrophils stimulated by LPS in the response to pentoxypilline *in vitro*. (Aktywność wydzielnicza neutrofilii w obecności pentoksyfiliny w odpowiedzi na LPS w warunkach *in vitro*).

Ref.: XV International Conference Students Scientific Circle (Section of Veterinary), Wrocław, 13–14 V 2010.

Publication: Proceedings of the XI International Conference Student Scientific Circle (Section of Veterinary), 109, 2010. In Polish.

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Ref.: XV International Conference Students Scientific Circle (Section of Veterinary), Wrocław, 13–14 V 2010.

Publication: Proceedings of the XI International Conference Student Scientific Circle (Section of Veterinary), 118, 2010. In Polish.

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Ref.: VIII International Conference an Ion Implantation and Other Applications of Ions and Electrons. Kazimierz Dolny, 14–17 VI 2010.

Publication: Proceedings of VIII International Conference an Ion Implantation and Other Applications of Ions and Electrons, 144, 2010. In English.

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Publication: Magazyn Wet. 19, 322–327, 2010. In Polish, summary in English.

BOBOWIEC R., WÓJCIK M.: Contribution of cholericotics in malabsorption and bovine liver diseases. (Choleretryki w zaburzeniach trawienia i chorobach wątroby u bydła).

Publication: Lecznica Dużych Zwierząt 5, 2, 100–105, 2010. In Polish.

SUB-DEPARTMENT OF PHARMACOLOGY

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RESEARCH STUDIES (SUMMARIES)

Mario Giorgi, Sara Del Carlo, Beata Łebkowska-Wieruszewska,
Cezary Kowalski, Giuseppe Saccomanni

PHARMACOKINETICS OF TRAMADOL AND METABOLITES AFTER INJECTIVE ADMINISTRATIONS IN DOGS

The aim of this study was to determine the pharmacokinetics of tramadol and its main metabolites after i.v. and i.m. injections. The pharmacokinetic cross-over study was carried out on 6 healthy male beagle dogs. Tramadol was administered by intravenous (i.v.) and intramuscular (i.m.) injection at 4 mg/kg. Tramadol and its main metabolites O-desmethyl-tramadol (M1), N-,N-didesmethyl-tramadol (M2) and N-,O-didesmethyl-tramadol (M5) concentrations were measured in plasma samples by a HPLC coupled with fluorimetric detection; pharmacokinetic evaluations were carried out with a compartmental and non-compartmental model for tramadol and its metabolites, respectively. The bioavailability of the drug, ranging between 84–102% (mean 92%), was within the generally accepted values for a positive bioequivalence decision of (80–125%). After the i.m. injection the mean plasma drug concentration peak was reached after a T(max) of 0.34 h with a C(max) of 2.52 microg/mL. No therapeutic relevant differences were observed between i.m. and i.v. administration. The minimal effective plasma concentration was reached after a few minutes and maintained for about 6–7 h in both administrations. M1 plasma concentration was low and the amounts of the other metabolites produced were analogous in both routes of administration. In conclusion, tramadol was rapidly and almost completely absorbed after i.m. administration and its systemic availability was equivalent to the i.v. injection. The different onset time and duration of action observed were very small and probably therapeutically irrelevant. The i.m. injection is a useful alternative to i.v. injection in the dog.

Publication: Pol. J. Vet. Sci. 13, 639–644, 2010, fig.1, tab.3. In English, summary in English.

Dorota Krasucka, Cezary Kowalski

PHARMACOKINETIC PARAMETERS OF AMOXICILLIN IN PIGS AND POULTRY

Pharmacokinetic studies are used to discover the fate of drug in the body. Knowledge of the route of removal, metabolic paths and the degree of efficiency are vital information's for the right dosage, which protects the body against potential drug toxicity. Amoxicillin (AMX) is a semisynthetic penicillin belonging to aminopenicillin group with a wide range of bactericidal activity against Gram negative and Gram positive pathogens. Amoxicillin resistant G+ and G- bacteria producing β -lactamase enzymes are: *Mycoplasma*, *Klebsiella* sp., *Proteus* sp., *Pseudomonas aeruginosa* and *Bacterioides fragilis*. Species, age of the animal, causative agent of the disease, general condition, capacity of the kidneys and liver, route of administration of antibiotics are factors affecting the pharmacokinetics of amoxicillin. A valuable feature of amoxicillin is very low toxicity to the mammalian body in comparison with other antibacterial preparations. The mechanism of activity is connected with a blockage of alaninotranspeptidase synthesis, which is vital for bacteria and is not produced in mammalian cells. The aim of this study was to determine and compare the pharmacokinetic parameters of amoxicillin in pigs and poultry.

Publication: Acta Poloniae Pharmaceutica – Drug Res. 67, 729–732, 2010, fig.3, tab. 5. In English, summary in English.

Beata Łebkowska-Wieruszewska, Cezary Kowalski

SULFACHLORPYRAZINE RESIDUES DEPLETION IN TURKEY EDIBLE TISSUES

Sulfachlorpyrazine (SCP) is currently used to treat coccidian infections in turkeys; however, there is no information available about the withdrawal period necessary for the turkey to be safe for human consumption. A high performance liquid chromatography method with ultraviolet-visible light detection was adapted and validated for the determination of SCP in turkey tissues. The procedure is based on isolation of the (SCP sodium) compound from edible turkey tissues (muscles, liver, kidneys, and fat with skin) with satisfactory recovery (72.80 ± 1.40) and specificity. The residue depletion of SCP in turkeys was conducted after a dose of 50 mg/kg body weight/day had been administered orally for 3 days. After treatment has been discontinued residue concentrations were detected in tissues on the 7th day. The highest SCP concentrations were measured in muscles. Based on the results presented in this study, it could be assumed that a withdrawal period of 21 days, before medicated turkeys could be slaughtered, would be sufficient to ensure consumer safety.

Publication: J. Vet. Pharmacol. Therap. 33, 389–395, 2010, fig. 4, tab. 1. In English, summary in English.

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Ref.: The VI Science-Training Conference: „Current problems of prophylaxis, diagnostics and therapy of inflammable, infectious and neoplastic diseases”, Jurata, 20–23 V 2010.

Publication: Proceedings of the VI Science-Training Conference “Current problems of prophylaxis, diagnostics and therapy of inflammable, infectious and neoplastic diseases”, 20, 2010. In Polish.

KOWALSKI C., ŁEBKOWSKA-WIERUSZEWSKA B.: Quinolone antibiotic therapy in respiratory diseases of cattle. (Chinolony w antybiotykoterapii chorób zakaźnych układu oddechowego bydła).

Ref.: The Science Conference „Modern methods in prevention and therapy of selected diseases in cattle”. Puławy, 23–24 IV 2010.

Publication: Proceedings of the Science Conference „Modern methods in prevention and therapy of selected diseases in cattle”: Veterinary Clinic of domestic animals – a nationwide quarterly magazine for veterinarians 2, 31–36, 2010. In Polish.

KOWALSKI C., ŁEBKOWSKA-WIERUSZEWSKA B., SACCOMANNI G., GIORGI M.: Differences in concentrations of tramadol and its major metabolites after per os sustained release tablet or per rectum suppository application.

Ref.: The VII Multidisciplinary Conference on Drug Research. Zakopane, 10–12 V 2010.

Publication: Proceedings of the VII Multidisciplinary Conference on Drug Research, 60, 2010. In English.

KRASUCKA D.M., KOWALSKI C.: Pharmacokinetic parameters of amoxicillin in pigs and poultry.

Ref.: The VII Multidisciplinary Conference on Drug Research. Zakopane, 10–12 V 2010.

Publication: Proceedings of the VII Multidisciplinary Conference on Drug Research, 24–25, 2010. In English.

ŁEBKOWSKA-WIERUSZEWSKA B., KOWALSKI C.J., BURMAŃCZUK A., OSYPIUK M., KLIMONT E.: Differing levels of sulfachloropyrazine residues in the poultry edible tissues. (Zróżnicowanie poziomów pozostałości sulfachloropirazyliny w tkankach jadalnych drobiu).

Ref.: The Science Conference: „Pharmacological and toxicological aspects of xenobiotics action”. Olsztyn, 24–25 VI 2010.

Publication: Proceedings of the Science Conference „Pharmacological and toxicological aspects of xenobiotics action”, 24, 2010. In Polish.

ZAŃ R., KOWALSKI C., ROLIŃSKI Z., BOJARSKA-JUNAK A., MADANY J., POLSKA B.: Concentration levels of endogenous melatonin (MT) in the diurnal cycle (winter) and after oral administration in the plasma dogs. Pilot studies. (Zachowanie się poziomów endogennej melatoniny (MT) w cyklu dobowym (zima) oraz po jej doustnym podawaniu w osoczu psów – badania pilotowe).

Ref.: The Science Conference: „Pharmacological and toxicological aspects of xenobiotics action”, Olsztyn, 24–25 VI 2010.

Publication: Proceedings of the Science Conference „Pharmacological and toxicological aspects of xenobiotics action”, 100, 2010. In Polish.

ZAŃ R., ROLIŃSKI Z., KOWALSKI C., BURMAŃCZUK A.: Effect of melatonin on animals behavior in various states of stress. (Wpływ melatoniny na zachowanie się zwierząt w różnych stanach stresowych).

Ref.: The VI Science-Training Conference: „Current problems of prophylaxis, diagnostics and therapy of inflammable, infectious and neoplastic diseases”. Jurata, 20–23 V 2010.

Publication: Proceedings of the VI Science-Training Conference „Current problems of prophylaxis, diagnostics and therapy of inflammable, infectious and neoplastic diseases”, 72, 2010. In Polish.

**SUB-DEPARTMENT OF VETERINARY TOXICOLOGY
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**RESEARCH STUDIES
(SUMMARIES)**

Grażyna Wałkuska, Hubert Bojar, Agnieszka Chałabis-Mazurek,
Krystyna Kursa

**MALLARD (*Anas platyrhynchos* L.) AS BIOINDICATOR OF POLLUTION
WITH SELECTED HEAVY METALS OF SOME WATER RESERVOIRS
IN THE LUBLIN DISTRICT**

The research conducted in a two-year cycle in 2001–2002 aimed to determine the level of water environment's pollution with heavy metals. The test involved 120 mallards (*Anas platyrhynchos* L.) obtained from four water reservoirs of different location and use. The concentrations found were as follows: the highest lead, copper, manganese and zinc concentrations in livers, cadmium in kidneys; comparable concentrations of chromium in livers, kidneys, hearts and muscles. The concentrations of arsenic and nickel in samples from organs and tissues remained below the detection level.

Publication: FEB 19, 383–389, 2010, fig. 6, tab. 5. In English, summary in English.

Grażyna Wałkuska, Agnieszka Chałabis-Mazurek, Józef Szkoda

**MERCURY CONTENT IN THE TROPHIC CHAIN OF THE TANEW RIVER,
POLAND ECOSYSTEM**

Mercury (Hg) is a highly toxic metal posing a hazard to water ecosystems. This investigation was aimed at determining Hg content in the Tanew river, Poland and subsequent transfer to fish inhabiting this lake. The area studied included approximately a 50 km distance of the river with 5 sampling sites se-

lected. Samples of water and bottom sediments were collected from 10 sites along the river-bank zone for each location. At the same location, fish were caught and samples of coastal water plants were collected. Fish that were caught included the following species: chub (*Leuciscus cephalus*), pike (*Esox lucius*), ide (*Leuciscus idus*) and roach (*Rutilus rutilus*). Dominating species of water plants included: reed-mace (*Typha angustifolia*), rigid hornwort (*Ceratophyllum demersum*) and water knotweed (*Polygonum amphibium*). Mercury content in samples of water, bottom sediments, water plants and fish tissues (muscles and gills) were determined by using Mercury/MA-2000 system (NIC, Japan). The average Hg content in the waters of Tanew ranged between 1 and 5 µg/L, and in the bottom sediments ranged between 17 and 214 µg/kg dry weight, which are characteristic values for typical unpolluted areas. The highest Hg contamination of waters and bottom sediments was found where the Tanew estuary enters the San river. Mercury levels in fish from the Tanew delta appeared to be higher compared to other sampling sites. Data indicated that even if water environment is contaminated with Hg to a limited extent, fish accumulate this metal at higher levels probably due to a bioaccumulation or bioconcentration factor.

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Grażyna Wałkuska, Agnieszka Wilczek

INFLUENCE OF DISCHARGED HEATED WATER ON AQUATIC ECOSYSTEM FAUNA

The problem of thermal water pollution is still relatively unknown in Europe. The development of industry, especially the power industry, causes the release of enormous amounts of water from cooling operations to aquatic ecosystems. The observations made here confirm that an increase in water temperature in a reservoir leads to changes in aquatic ecosystem function and affects reservoir animals. Water temperature is one of the factors that determine species occurrence. Changes in water temperature immediately change fauna distribution and, consequently, the trophic relationships in a given ecosystem. Changes in water temperature can create conditions suitable for introduced fauna and may exacerbate the activity of infectious disease and parasitic agents that can damage native fauna populations. Increasing water temperature can lead to more frequent infections in animals by affecting the animal's immune system and by influencing pathogenicity. Thermal pollution of water bodies is not ecologically neutral and needs more attention from European scientists, especially ecologists.

Publication: Pol. J. Environ. Stud. 19, 547–552, 2010. In English, summary in English.

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Publication: Ann. Anim. Sci. 10, 267–274, 2010. In English, summary in English.

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Ref.: Conference “Pharmacological and toxicological aspects of xenobiotic action”, UWM, Olsztyn, 24–25 VI 2010.

Publication: Proceedings of Conference “Pharmacological and toxicological aspects of xenobiotic action”, 46, 2010. In Polish.

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Publication: Proceedings of Conference “Pharmacological and toxicological aspects of xenobiotic action”, 115, 2010. In Polish.

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