
EXCERPTA
VETERINARIA
LUBLIN

Vol. 45 (2006) AGRICULTURAL UNIVERSITY OF LUBLIN 2007

PUBLISHED ANNUALLY
BY
THE FACULTY OF VETERINARY MEDICINE

Editor
Grażyna Ziółkowska

Secretary
Grażyna Wrzosek-Łobocka

© Copyright by Wydawnictwo Akademii Rolniczej w Lublinie, Lublin 2007

ISSN 0239-3298

Technical editor
Ewa Różycka

Project of cover
Barbara Jarosik

WYDAWNICTWO AKADEMII ROLNICZEJ W LUBLINIE
Nakład 350 + 16 egz. Ark. wyd. 6,9. Zam. 164/2007
Skład i druk: Pracownia Poligraficzna AR w Lublinie

CONTENTS

Preface.....	4
FACULTY OF VETERINARY MEDICINE, Lublin 2006	5
Institute of Biological Rudiments of Animal Diseases.....	12
Sub-Department of Fish Diseases and Biology.....	12
Sub-Department of Parasitology and Invasive Diseases	14
Sub-Department of Poultry Diseases	16
Sub-Department of Veterinary Microbiology	18
Sub-Department of Veterinary Prophylaxis.....	24
Department of Anatomy and Animal Histology	30
Sub-Department of Animal Anatomy	30
Sub-Department of Histology and Embryology.....	36
Department of Biochemistry and Animal Physiology	39
Sub-Department of Animal Physiology	39
Sub-Department of Biochemistry	61
Department and Clinic of Animal Internal Diseases	67
Department and Clinic of Animal Reproduction.....	74
Department and Clinic of Animal Surgery	76
Laboratory of Radiology and Ultrasonography.....	80
Department of Epizootiology and Clinic of Infectious Diseases	82
Department of Food Hygiene of Animal Origin.....	89
Department of Pathological Anatomy	93
Department of Preclinical Veterinary Science.....	97
Sub-Department of Pathophysiology	97
Sub-Department of Pharmacology	105
Sub-Department of Veterinary Toxicology and Environment Protection	111
Index of authors.....	115

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:

EXCERPTA VETERINARIA LUBLIN
Akademicka 12
20-033 Lublin
POLAND
tel. (48-81) 445-66-96
fax (48-81) 533-37-52, 445-60-06
e-mail: grazyna.ziolkowska@ar.Lublin.pl

FACULTY OF VETERINARY MEDICINE LUBLIN 2006

Structure

Veterinary Medicine Faculty belongs to one of seven Faculties of the Agricultural University. At present, this Faculty consists of 1 Institute, 8 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. extraordin. Dr. habil. Andrzej Wernicki

Vice Dean: Prof. extraordin. Dr. habil. Zbigniew Grądzki
Prof. extraordin. Dr. habil. Stanisław Winiarczyk

Professors

Prof. ordin. Dr. habil. Ryszard Bobowiec
Prof. Dr. habil. Zbigniew Boratyński
Prof. extraordin. Dr. habil. Regina Cybulska
Prof. extraordin. Dr. habil. Ryszard Eustachiewicz
Prof. ordin. Dr. habil. Józef Filar
Prof. ordin. Dr. habil. Stanisław Flieger
Prof. ordin. Dr. habil. Zdzisław Gliński
Prof. extraordin. Dr. habil. Zbigniew Grądzki
Prof. Dr. habil. Marta Kankofer
Prof. extraordin. Dr. habil. Krzysztof Kostro
Prof. Dr. habil. Cezary Kowalski

Prof. Dr. habil. Leszek Krakowski
Prof. ordin. Dr. habil. Eligiusz Madej
Prof. extraordin. Dr. habil. Zbigniew Nozdryn-Plotnicki
Prof. ordin. Dr. habil. Elżbieta Pełczyńska
Prof. ordin. Dr. habil. Zbigniew Pomorski
Prof. ordin. Dr. habil. Jerzy Rzedzicki
Prof. Dr. habil. Andrzej Bernard Sadzikowski
Prof. Dr. habil. Piotr Silmanowicz
Prof. extraordin. Dr. habil. Antonina Sopińska
Prof. extraordin. Dr. habil. Adam Stec
Prof. Dr. habil. Krzysztof Szkucik
Prof. ordin. Dr. habil. Władysław Wawron
Prof. extraordin. Dr. habil. Andrzej Wernicki
Prof. extraordin. Dr. habil. Stanisław Winiarczyk
Prof. extraordin. Dr. habil. Zygmunt Wrona
Prof. Dr. habil. Grażyna Ziółkowska
Dr. habil. Ireneusz Balicki
Dr. habil. Wojciech Cybulski
Dr. habil. Jadwiga Jaworska-Adamu
Dr. habil. Hanna Lutnicka
Dr. habil. Barbara Majer-Dziedzic
Dr. habil. Zygmunt Nowakowski
Dr. habil. Iwona Puzio
Dr. habil. Marek Szczubiał
Dr. habil. Grażyna Wąkuska

Assistants, adjuncts and lecturers: 83

Technicians: 58

Received the degree of Doctor of Veterinary Science: 9

Received the degree of Doctor habil.: 3

Students: 1000

Received the diploma of veterinary surgeon: 120

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 Agricultural University

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

1	2	3	4	5
Fish husbandry and diseases	15	30	VII	E
Anaesthesiology	15	15	VII	E
Veterinary radiology	30	30	VII	E
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

Total	315 hours
-------	-----------

Altogether didactic hours

General specific and professional subject	3885 hours
Optional subject	150 hours
Clinical practices	315 hours

Total	4350 hours
-------	------------

Professional trainings

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

**RESEARCH ACTIVITY
OF VETERINARY MEDICINE FACULTY**

(Published in 2006)

INSTITUTE OF BIOLOGICAL RUDIMENTS OF ANIMAL DISEASES

30 Głęboka, Lublin

Head: Prof. ordin. Dr. habil. Jerzy Rzedzicki

SUB-DEPARTMENT OF FISH DISEASES AND BIOLOGY

12 Akademicka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Leszek Guz

INFLUENCE OF METAL IONS ON *Aeromonas* spp. PROTEASE ACTIVITY

Wpływ jonów metali na aktywność proteolityczną bakterii z rodzaju *Aeromonas*

Aeromonas organisms are widely distributed in aquatic environment and are also recognized as pathogens of a variety of animals and man. The aim of this study was to determine the effect of metal ions (Ca^{+2} , Cu^{+2} , Fe^{+2} , Mg^{+2} , Zn^{+2}) and protease inhibitors (PMSF, EDTA, E-64) on the activity of the *Aeromonas* supernatant caseinase and elastase activity. Sixteen strains of bacteria isolated from MAI/MAS diseased carp, identified as *A. hydrophila* ($n = 13$) and *A. sobria* ($n = 3$) were used in this study. Zinc and copper inhibited the activity of the *Aeromonas* supernatant caseinase, whereas zinc, copper, iron inhibited the elastase activity.

Publication: Medycyna Wet. (Lublin), 62, 814–816, 2006, fig. 2. In Polish, summary in English.

OTHER PUBLICATIONS

GUZ L.: Ligulosis in fish. (Liguloza ryb).

Publication: Magazyn Wet. 15, 76, 2006. In Polish.

GUZ L.: Carp diseases caused by flukes. Class *Trematoda*. (Choroby karpia wywoływane przez przywry. I. Gromada *Trematoda*).

Publication: Medycyna w Praktyce 3, 30–36, 2006. In Polish, summary in English.

GUZ L.: Carp diseases caused by flukes. Class *Monogenea*. (Choroby karpia wywoływane przez przywry. II. Gromada *Monogenea*).

Publication: Medycyna w Praktyce 3, 50–53, 2006. In Polish, summary in English.

SUB-DEPARTMENT OF PARASITOLOGY AND INVASIVE DISEASES

12 Akademicka, Lublin

Head: Prof. Dr.habil. Andrzej Bernard Sadzikowski

REPORTS TO RESEARCH MEETINGS

TOMCZUK K., SADZIKOWSKI A.B., STUDZIŃSKA M.B.: Prevalence of *Eimeria leuckarti* in horses in the South-East Poland. (Das Vorkommen von *Eimeria leuckarti* bei Pferden in Sud-Ostpolen).

Ref. Tagung der DVG-Fachruppe „Parasitologie und parasitäre Krankheiten”. Wetzlar, 7–9 VI 2006.

Publication: Diagnostik, Epidemiologie und Bekämpfung von Parasitosen bei Nutz-, Haus- und Heimtieren, 123, 2006, In German.

TOMCZUK K., SADZIKOWSKI A.B., STUDZIŃSKA M.B.: Befall of tapeworms in horses in the South-East Poland. (Befall von Pferden mit Bandwürmern der Familie Anoplocephalidae in Sud-Ostpolen).

Ref. Tagung der DVG-Fachruppe „Parasitologie und parasitäre Krankheiten”. Wetzlar, 7–9 VI 2006.

Publication: Diagnostik, Epidemiologie und Bekämpfung von Parasitosen bei Nutz-, Haus- und Heimtieren, 54, 2006, In German.

OTHER PUBLICATIONS

GUNDEŁACH J.L., SADZIKOWSKI A.B., STUDZIŃSKA M.B.: Protozoan invasions of horses. (Inwazje pierwotniaków u koni).

Publication: Annales UMCS sectio DD, 61, 31–44, 2006, tab. 2. In Polish, summary in English.

GUNDEŁACH J.L., SADZIKOWSKI A.B.: Animals the source of parasitic invasions for humans. Invasions of trematodes. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Inwazja przywr).

Publication: Aktualności AR (Lublin) 10, 21, 2006, fig. 2. In Polish.

SADZIKOWSKI A.B.: Prof. zw. dr habil. Jerzy Lech Gundęłach 1939–2006.

Publication: Medycyna Wet. (Lublin) 62, 847, 2006 fig. 1. In Polish.

SADZIKOWSKI A.B.: J.L. Gundęłach 1938–2006.

Publication: Aktualności AR (Lublin) 10, 10–11, 2006, fig. 1. In Polish.

SADZIKOWSKI A.B.: Effects of viper-bite. (Następstwa ukąszeń przez żmije).

Publication: Aktualności AR (Lublin) 10, 12–13, 2006, fig. 1. In Polish.

SADZIKOWSKI A.B.: Animals the source of parasitic invasions for humans. Migrating larvae of nematodes of carnivorous animals. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Wędrujące larwy nicieni zwierząt mięsożernych).

Publication: Aktualności AR (Lublin) 10, 23, 2006, fig. 5. In Polish.

SADZIKOWSKI A.B.: Animals the source of parasitic invasions for humans. Toxocarosis of dogs. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Glistnica psów).

Publication: Aktualności AR (Lublin) 10, 21, 2006, fig. 1. In Polish.

SADZIKOWSKI A.B.: Simulidosis of horses. (Inwazje meszek u koni).

Publication: Informator Polskiego Stowarzyszenia Użytkowników i Przyjaciół Koni Roboczych oraz Konnych Producentów Zdrowej Żywności. 7, 13–15, 2006. In Polish.

SADZIKOWSKI A.B.: Cestodosis of horses. (Tasiemczycza koni).

Publication: Informator Polskiego Stowarzyszenia Użytkowników i Przyjaciół Koni Roboczych oraz Konnych Producentów Zdrowej Żywności. 8, 27–30, 2006. fig. 4. In Polish.

SUB-DEPARTMENT OF POULTRY DISEASES

30 Głęboka, Lublin

Head: Prof. ordin. Dr. habil. Jerzy Rzedzicki

RESEARCH STUDIES (SUMMARIES)

Monika Skowron, Jerzy Rzedzicki, Agnieszka Kolasa

IDENTIFICATION OF *Salmonella* RODS IN TISSUES OF HENS TREATED WITH SELECTED ANTIBIOTICS

Poultry products contaminated with *Salmonella* rods are most often mentioned as a *Salmonella* source as well as a cause of human's nutritional infections. The general objective of undertaken studies was to evaluate the influence of bird's treatment with antibiotics on identification of their infection by *Salmonella* rods applying bacteriological, serological and PCR techniques. The experiments included 80 birds infected with *Salmonella Enteritidis* rods. The following antibiotics were used in the experiments: enrofloxacin, norfloxacin, tiamphenicol, and florphenicol. *Salmonella* rods were isolated according to PN ISO 6579:1997. Bacterial DNA was extracted applying Genomic DNA Prep Plus kit by means of indirect method. InvA1 (GTGAAATTATCGCCACGTTCCGGCAA), InvA2 (TCATCGCACCGTC AAAGGAACC), and 284 pz. starters were used for amplifications: Salmonellas were isolated from intestines and other internal organs. The higher isolation percentage was achieved in PCR technique tests.

Publication: Annales UMCS, section DD (Lublin) 61, 229–238, 2006, fig. 1, tab. 2. In English, summary in Polish.

REPORTS TO RESEARCH MEETINGS

KOLASA A., RZEDZICKI J., SKOWRON M.: The influence of the therapy of hens with selected antibiotics on the transmission of *Salmonella* in to eggs contents. (Wpływ terapii kur niosek wybranymi antybiotykami na przekazywanie pałeczek *Salmonella* do treści jaj).

Ref. Conference: „The current problems in the pathology of poultry”. Wrocław, 15–16 IX 2006.

Publication: Proceedings of the Conference: „The current problems in the pathology of poultry”, 40–45, 2006. In Polish.

SKOWRON M., RZEDZICKI J., KOLASA A.: The assessment of selected diagnostic methods applied to the detection of infection chicken with *Salmonella* after antibiotic therapy. (Ocena wybranych metod diagnostycznych stosowanych do wykrywania zakażeń pałeczkami *Salmonella* u kurcząt po antybiotykoterapii).

Ref. Conference: „The current problems in the pathology of poultry”. Wrocław, 15–16 IX 2006.

Publication: Proceedings of the Conference: „The current problems in the pathology of poultry”, 46–48, 2006. In Polish.

RZEDZICKI J., KOLASA A.: The hazards of chemotherapy and chemoprophylactics, the usefulness of alternative methods. (Chemioterapia, chemioprophylaktyka, zagrożenia i postępowania alternatywne).

Ref. Conference: „The current problems in the pathology of poultry”. Wrocław, 15–16 IX 2006.

Publication: Proceedings of the Conference: „The current problems in the pathology of poultry”, 11–48, 2006. In Polish.

OTHER PUBLICATIONS

KOLASA A.: Deep pectoral myopathy – the disease of green muscle. (Głęboka mioopatia piersiowa – choroba zielonego mięśnia).

Publication: Pol. Drob. 6, 40–42, 2006. In Polish.

SKOWRON M.: The immunosuppression factors in birds. (Czynniki immunosupresji u ptaków)

Publication: Weterynaria w Praktyce. Monografia – Jesień, 12–14, 2006.

SUB-DEPARTMENT OF VETERINARY MICROBIOLOGY

12 Akademicka, Lublin

Head: Prof. Dr. habil. Grażyna Ziólkowska
Dr. habil. Barbara Majer-Dziedzic

RESEARCH STUDIES (SUMMARIES)

Barbara Majer-Dziedzic, Jan Buczek, Roman Dziedzic, Jerzy Ziętek

VIRAL HEMORRHAGE DISEASE IN HARES (EUROPEAN BROWN HARE SYNDROME, IN BREEDING FARMS – PROPHYLACTIC MEASURES

Przypadki choroby krwotocznej zajęcy (European Brown Hare Syndrome)
w hodowli kwaterowej – próby profilaktyki

The viral etiology of the disease was established on the basis of virological, anatomopathological, and bacteriological examinations. The isolated aetiological agent of the European Brown Hare Syndrome virus (EBHS; Caliciviridae, Logovirus) was used to produce its own vaccine against EBHS. The vaccine was used to immune 82 hares and eliminated the mortality rate of EBHS infected hares under controlled conditions. The study confirmed the minor pathogenicity of the EBHS virus for rabbits and indicated the presence of cross-immune reactions between the EBHS and RHD viruses.

Publication: Medycyna Wet. (Lublin) 62, 807–810, 2006, fig. 4, tab. 4. In Polish, summary in English.

Stanisław Tokarzewski, Andrzej Wernicki, Marta Kankofer,
Renata Urban-Chmiel, Marcin Arciszewski

TRANSPORT AT CHICKEN BROILERS AS AN AGENT INCREASED STRESS RESPONSE

Transport jako czynnik wzmagający reakcje stresowe u brojlerów kurzych

In intensive breeding of animals, especially poultry is significantly conducive to stressful situations. Commonly known is the fact of unfavorable influence of

stress factor on the bird organism, which leads to the increase of illnesses as a result of immunological response dysfunction. As a result, even weak pathogenic microorganisms may add to the appearance of an infection and clinical disease development. The aim of the conducted research was defining the transport stress impact on chicken broilers. The research was conducted on two groups of birds Ross 308 breed, aged 14 and 30 days composed of 5 heads each, which were transported on 180 km distance during two hours. The birds were clinically healthy, free of parasites and free of *Salmonella* sp. infection in the beginning of the experiment. They were housed in separate cages during the transportation. The blood smears and samples from the wing vein had been taken before the transportation, directly after and two days later. In order to specify the stress intensity the proportion of heterophils to lymphocytes (H/L) was counted according to Collette et al. [2000] method, which is the basic indicator of bird stress. In the serum samples the total protein level was noted with the use of biuret reaction with the wavelength of 546 nm. Additionally, in the examined samples the cortisol level (ELISA) were estimated. The analysis of the t-Student results showed the statistically significant increase at both: birds aged 14 as well as 30 days ($p < 0.05$) in proportion of heterophils to lymphocytes directly immediately after transport and decreased 2 days after transport. What is more, the increase of total protein level at both broiler groups has been revealed. It was particularly observed 2 days after the transport. In both examined groups of birds the transport stress significantly influenced cortisol level, which increased directly immediately after transport and decreased 2 days after it.

Publication: Annales UMCS (Lublin) sectio DD, 61, 128–134, 2006, fig. 4, tab. 2. In Polish, summary in English.

Grażyna Ziółkowska, Aneta Nowakiewicz

THE ISOLATION OF LIPID-DEPENDENT STRAINS *Malassezia* FROM DOGS AND CATS

Przypadki izolacji lipidozależnych szczepów *Malassezia* od psów i kotów

The investigations covered 180 dogs and 35 cats with otitis externa symptoms and clinically healthy. There were isolated 96 strains *Malassezia*, in that 13.5% (13 strains) constituted the lipid-dependent species, the others were classified as *M. pachydermatis*. Ten lipophilic isolates came from the diseased animals, in that two were isolated from dogs. Within the lipophilic strains pool, on the grounds of the phenotype classification, there were isolated *M. globosa* (5 strains), *M. sympodialis* (5 strains), *M. furfur* (one strain) and two isolates species remained unidentified. The genotypic identification was performed by PCR-REA (ITS, 26S, Bt). The biochemical identification results for all the strains *M. sympodialis*

and *M. globosa* were confirmed. A strain *M. furfur* and two isolates of unrecognizable species were reclassified to *M. pachydermatis*. The isolation of lipid-dependent strains *Malassezia* from the animals with otitis externa is a weighty report, whereas their isolation and identification by the techniques of molecular biology from dogs has been, according to our knowledge, the first case described.

Publication: Medycyna Wet. (Lublin) 62, 913–916, 2006, fig. 5, tab. 2. In Polish, summary in English.

Grażyna Ziółkowska, Stanisław Tokarzewski

PROTEIN PROFILES OF SURFACE ANTIGENS OF DERMATOPHYTES

Profile białkowe antygenów powierzchniowych dermatofitów

The objective of the study was to determine the optimal conditions for obtaining species – specific surface antigens of dermatophytes (the present authors' methodology) as well as their protein profiles analysis. The studies included the clinical isolates of the following strains: *Microsporum canis*, *Trichophyton verrucosum*, *Trichophyton mentagrophytes* and *Microsporum gypseum*. The analyzed strains were cultured on Sabouraud's solid medium for 7 and 21 days at 25°C temperature (*M. canis*, *M. gypseum*) and at 37°C (*T. verrucosum*, *T. mentagrophytes*). Surface antigens were obtained from this material according to the present authors' methodology, the established elution time of antigen fraction was 1,3 and 24 h. The obtained protein fractions were stored as a lyophilized at temperature of -20°C. The protein profiles of each antigen preparation were determined by SDS PAGE technique after Laemmli. The documents and analysis of the fractions obtained were performed with Gel-Doc (Bio-Rad). The studied preparations exhibited from 8 to 18 components of 190 kDa – 14.8 kDa molecular weight, while their qualitative and quantitative composition depended on the conditions of preparation obtainment and a fungus species. The comparative analysis of dermatophyte protein profiles comprised the selected preparations obtained after the 24 hours' elution and a week fungus culture. Besides the common components (70, 35 and 25 kDa), the examined surface antigens contained the species-specific fractions: a band of 27,7 kDa molecular weight was characteristic for *M. canis*, 107 and 87.3 kDa for *M. gypseum* and for *T. mentagrophytes* – 73.6; 59.4 and 45.6 kDa. The isolation and detailed characteristics of these proteins are likely to facilitate a quick and more specific diagnostics of dermatophytoses as well as the thorough recognition of fungus pathogenicity mechanisms.

Publication: Medycyna Wet. (Lublin) 62, 1056–1058, 2006, fig. 2, tab. 1. In Polish, summary in English.

Grażyna Ziółkowska, Stanisław Tokarzewski

**DETERMINATION OF ANTIFUNGAL ACTIVITY
OF BIOCIDAL PREPARATION ENIZOL**

Oznaczenie antygrzybiczej aktywności biobójczego preparatu Enizol

The objective of the studies was to evaluate the antifungal activity of Enizol, a new disinfecting preparation with enilkonazole as the active substance. The initial concentration of Enizol for the both studies *in vitro* and *in vivo* was constituted by aqueous solution of preparation at 1:100 ratio. The investigations covered 34 strains of the following mould fungi: *A. fumigatus* (n = 5), *A. versicolor* (n = 3), *Penicillium spp.* (n = 5), *Cladosporium spp.* (n = 4), *Scopulariopsis spp.* (n = 3), *Fusarium spp.* (n = 4), *Alternaria spp.* (n = 5), *Mucor spp.* (n = 5), as well as 10 strains of yeast-like fungi: *Candida albicans* (n = 5) and *Candida non-albicans* (n = 5). The minimal inhibitory concentration (MIC) and minimal fungicidal concentration (MFC) of Enizol was determined *in vitro* according to NCCLS M27-A and by a cylinder dilution method. The MIC values for these organisms appeared to be differentiated and ranged from 0,07 µgml⁻¹ (*A. versicolor*) up to 37.5 µgml⁻¹ (*Mucor spp.*). A group of extremely sensitive fungi comprised *Aspergillus spp.* (0.07–1.2 µgml⁻¹), *Penicillium spp.* (0.07–1.2 µgml⁻¹) and *Alternaria spp.* (2.4 µgml⁻¹); *Cladosporium spp.* genus (4.75 µgml⁻¹) showed the medium susceptibility to the inhibitory activity of Enizol, whereas *Fusarium spp.* (9.5 µgml⁻¹), *Mucor spp.* (19.0–37.5 µgml⁻¹) and *Scopulariopsis spp.* (19.0 µgml⁻¹) the lowest values. The antifungal efficacy of the studied preparation is confirmed by its killing characteristics. The minimal fungicidal concentrations (MFC) were differentiated, subject to a species of a fungus studied. At the same time the sensitivity of anascogenic yeasts *Candida* genus was analyzed and as a result classified the fungi among the organisms relatively resistant to (9.5 µgml⁻¹ MIC, 37.5 µgml⁻¹ MFC) Enizol activity. The studies *in vivo* confirmed the sensitivity of fimbriate fungi to the preparation and, commonly, it was consistent with the tests *in vitro*. At the same time the antifungal efficacy of Enizol *in vivo* was demonstrated towards the fungi *Candida* genus, that indicates its usability as a killing preparation in the environment where animals stay.

Publication: Medycyna Wet. (Lublin) 62, 792–796, 2006, tab. 4. In Polish, summary in English.

Grażyna Ziólkowska, Stanisław Tokarzewski, Aneta Nowakiewicz,
Anna Kostruba

BACTERIOLOGICAL FLORA ISOLATED FROM GEESE REPRODUCTIVE FLOCKS

The objective of the experiments was to determine the bacteria species isolated from the ontocenoses of the beak cavity and cloaca in the reproductive geese flocks as well as to recognize the potential dependence of the microbial spectrum on bird age, environmental conditions and season. The studies covered 17 farms of reproductive geese white Italian breed reared under differentiated conditions. The experimental material was constituted by the beak cavity and cloaca swabs (920 samples). Isolation and identification of every bacteria species was performed according to the conventional bacteriological methods with commercial tests, the obtained results were analysed statistically by t-Student test. Regardless of a sampling site (beak cavity, cloaca) the isolated bacterial flora composition included: *Escherichia coli*, *Proteus spp.*, *Staphylococcus spp.*, *Streptococcus spp.* and *Enterococcus spp.* Moreover, in single cases *Bacillus spp.*, *Citrobacter spp.*, *Yersinia spp.*, *Enterobacter spp.* and *Klebsiella spp.* were identified. Each microbial species incidence was mainly contingent on the environmental conditions and the examined bird age, while on the ontocenosis to a smaller extent.

Publication: Annales UMCS (Lublin) sectio DD, 61, 75–86, 2006, fig. 3, tab. 4. In English, summary in Polish.

Grażyna Ziólkowska, Stanisław Tokarzewski, Sławomir Strumiło, Adam Tylicki

ANTIFUNGAL EFFICACY OF OXYTHIAMINE – ANTIVITAMIN DERIVATIVE OF VITAMIN B₁

The *in vitro* antifungal activity (MIC, MFC) of oxythiamine was assessed against 15 dermatophyte strains, 9 moulds and 24 yeast-like fungi. High activity of oxythiamine was determined towards *Malassezia pachydermatis* strains (n = 10); in this case MIC was found within 1.25–2.5 µl⁻¹. The biocidal efficacy (MFC) of oxythiamine was not recorded in any drug dose applied.

Publication: Annales UMCS (Lublin) sectio DD, 61, 69-73, 2006, tab. 2. In English, summary in Polish.

REPORT TO RESEARCH MEETINGS

- ZIÓŁKOWSKA G., TOKARZEWSKI S.: Fungi as potential menace to the state of birds' health. (Grzyby jako potencjalne zagrożenie stanu zdrowia ptaków).
Ref. International Conference „The current problems in the pathology of poultry”, Wrocław, 15–16 IX 2006.
Publication: Proceedings of the Conference (Monograph), 58–62, 2006. In Polish.
- ZIÓŁKOWSKA G., TOKARZEWSKI S.: Mycological flora isolated from geese reproductive flocks – moulds. (Flora grzybicza w stadach gęsi reprodukcyjnych – grzyby pleśniowe).
Ref. International Conference „The current problems in the pathology of poultry”, Wrocław, 15–16 IX 2006.
Publication: Proceedings of the Conference (Monograph), 63-67, 2006. In Polish.
- Ziółkowska G. Nowakiewicz A.: Protein profiles of the surface antigens of *Malassezia pachydermatis*. (Profile białkowe antygenów powierzchniowych *Malassezia pachydermatis*).
Ref. XII International Symposium of the Mycology Section Polish Dermatology Society „Mycology 2006”. Białowieża, 20–24 IX 2006.
Publication: Mikologia Lekarska (Wrocław) (suppl.), 13, 2006. In English.

OTHER PUBLICATIONS

- ZIÓŁKOWSKA G., TOKARZEWSKI S.: Enizol – an antifungal preparation for animal habitat use. (Enizol – preparat przeznaczony do zwalczania grzybów w najbliższym środowisku bytowania zwierząt).
Publication: Pol. Drob. 1, 47–49, 2006. In Polish.
- ZIÓŁKOWSKA G., TOKARZEWSKI S.: Fungi as potential menace to the state of birds' health
Part I. (Grzyby jako potencjalne zagrożenie stanu zdrowia ptaków. Część I).
Publication: Pol. Drob. 11, 23-25, 2006. In Polish.
- ZIÓŁKOWSKA G., TOKARZEWSKI S.: Fungi as potential menace to the state of birds' health
Part II. (Grzyby jako potencjalne zagrożenie stanu zdrowia ptaków. Część II).
Publication: Pol. Drob. 12, 16–20, 2006. In Polish.
- Ziętek J., Ziętek E.: Tularemia – rodent plague. A hazard to human. (Tularemia – dżuma gryzoni. Zagrożenie dla człowieka).
Publication: Weterynaria w Praktyce 2, 56–58, 2006. In Polish.
- Ziętek J., Biegała P.: Parvovirus in dog. A still current problem. (Parwowirusa psów. Problem wciąż aktualny).
Publication: Weterynaria w Praktyce 4, 38–40, 2006. In Polish.

SUB-DEPARTMENT OF VETERINARY PROPHYLAXIS

12 Akademicka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Maria Kowalska, Jacek Sroka

STUDIES ON THE PREVALENCE OF ANTIBODIES TO *Toxoplasma gondii* IN DOGS FROM THE LUBLIN MACROREGION

Badania nad występowaniem przeciwciał anty-*Toxoplasma gondii*
w surowicach psów z terenu Lubelszczyzny

Blood sera of 43 adult dogs were analysed, the patients of veterinary ambulatory clinics and departments, mongrel dogs and Alsatians that showed symptoms which could indicate a suspicion of chronic neurological form of toxoplasmosis. The level of *Toxoplasma gondii* specific IgG antibodies was determined once by the direct agglutination method.

From among 43 dogs in the study, agglutinins against *T. gondii* were noted in blood sera of 20 (46.51%), and were more frequently observed in a group of older and mongrel dogs (71.42% and 50.94%), whereas in female and male dogs positive reactions occurred equally often (47.05% and 46.15% respectively). The study showed that dogs are frequently infected with *T. gondii*, and due to non-specific symptoms the disease is not diagnosed and treated. Frequent invasion by *T. gondii* in the population of the dogs examined confirms the necessity to consider toxoplasmosis during routine differential diagnostics of neurological cases in dogs. The presented preliminary results of the study may be useful in epidemiological studies in searching for the reservoir of this protozoon in the external environment.

*Publication: Annales UMCS (Lublin), sectio DD, 59, 61–68, 2006, tab. 2.
In Polish, summary in English.*

Patryk Mikucki, Andrzej Wernicki, Andrzej Puchalski, Renata Urban-Chmiel

**USE OF NATIVE AND INACTIVATED LEUKOTOXIN *Mannheimia haemolytica*
IN SPECIFIC IMMUNOPROPHYLAXIS OF RESPIRATORY SYNDROME IN SHEEP**

Skuteczność natywnej i inaktywowanej leukotoksyny *M. haemolytica*
w immunoprofilaktyce swoistej syndromu oddechowego owiec

The objective of this study was comparison of immunostimulating properties and prophylaxis effect of *M. haemolytica* leukotoxin (Lkt) native and inactivated by formaldehyde and glutaraldehyde. There were also evaluated the neutralizing properties of antibodies induced by different forms of Lkt and the protective effect on experimental challenge of sheep. The carried out study suggests that the inactivation procedure has an important influence on immunogenicity of the obtained toxoids. Vaccines used in immunized animals showed the presence of immunogenicity during increasing specific antibody titers in sera after immunization of sheep. The increase of neutralizing properties of antibodies contained in sera of animals immunized by Lkt was noted. Obtained results showed the possibility of more effective use of *M. haemolytica* Lkt isolated from bovine respiratory syndrome as a subunit of vaccines in immunoprophylaxis of this disease in sheep.

Publication: Medycyna Wet. (Lublin) 62, 1302–1305, 2006, fig. 2, tab. 2. In Polish, summary in English.

Renata Urban-Chmiel

**THE INFLUENCE OF INCREASE TEMPERATURE
ON HEAT SHOCK PROTEINS EXPRESSION AMONG WILDTYPE *M. haemolytica* STRAINS**

Wpływ podwyższonej temperatury na ekspresję białek szoku termicznego (Hsp70)
u terenowych szczepów *M. haemolytica* serotyp 1

The purpose of this study was an estimation of temperature increase on Hsp70 induction in *M. haemolytica* serovar 1 strain. Three wildtype *M. haemolytica* strains, obtained from calves respiratory tract were used as a material, were incubated at temp. 41.5°C for 2 hours. The analysis of particular fractions were carried out by SDS–PAGE electrophoresis. Identification of obtained proteins was carried out by immunoblotting (Western blotting) using polyclonal rabbit anti Hsp70 antibodies. In two-dimensional electrophoresis, at the first step the separation in capillars in gradient pH 5/7 and 3/10 was carried out. The second step was made in SDS–PAGE electrophoresis using 4% stocking and 12% resolv-

ing gels. Analysis of SDS-PAGE electrophoresis showed additional protein fractions which showed positive reactions with anti-Hsp70 antibodies. The presence of these proteins was observed both in membrane and cytoplasmatic bacterial cell fractions. Molecular weight of obtained proteins was contained between 77.5–79 kDa. In membrane fraction the additional protein fractions were present between mol. Weight 22–26 kDa, and they also showed a positive reaction with anti-Hsp70 antibodies. The electrophoregrams obtained in 2D electrophoresis showed the presence of additional spots in membrane, cyto- and periplasmatic fractions. The research results suggest a potency of *M. haemolytica* strains for Hsp70 production during stress caused by temperature increase.

Publication: Medycyna Wet. (Lublin) 62, 801–803, 2006, fig. 4. In Polish, summary in English.

Renata Urban-Chmiel, Andrzej Puchalski, Andrzej Wernicki

THE INFLUENCE OF THE TRANSPORT STRESS ON SUSCEPTIBILITY OF BOVINE LEUKOCYTES TO CYTOTOXIC EFFECT OF *M. haemolytica* LEUKOTOXIN

Wpływ stresu transportowego na stopień wrażliwości leukocytów na działanie leukotoksyny *M. haemolytica*

The purpose of the study was estimation the viability and susceptibility effect of leukocytes isolated from cattle before and after the transportation *in vitro* to *M. haemolytica* leukotoxin (Lkt) cytotoxicity. In experiment, 40 Simentaler heifers transported on truck for the distance of 1700 km for 72 hours were used. The material for the study was blood (40 samples) collected on heparin directly before and after the transportation. In relation to leukocytes, the examination of susceptibility to cytotoxic effect of Lkt was carried out with the use of MTT (microtitration assay) and viability of leukocytes after 1, 2, 3 and 6 hour of incubation. The results obtained in cell viability test did not show the statistical significant differences ($P \geq 0.05$) in 1st and 2nd incubation hour in leukocytes obtained from heifers prior to and after transportaion. After 1st incubation hour the percent of leukocytes viability was on a very high level and showed 87% in both groups of animals. The significant lower cell viability values in comparison to leukocytes isolated from animals before the transportation was observed in transported heifers from 3rd to 6th incubation hour. The analysis of the results obtained in MTT test showed statistically significant differences in susceptibility of leukocytes to cytotoxic activity of Lkt. The average values of toxic activity of Lkt in relation to leukocytes isolated before and after the transportation was 79%

and 92%, respectively. The lytic activity of Lkt for 50% of cell population referred as 1 unit (1U) was observed in Lkt concentration 15 µg/ml (leukocytes before transportation) and 7,5 µg/ml (after transportation). The increase of susceptibility of leukocytes isolated after the transportation to cytotoxic effect of leukotoxin suggests the significant influence of transporting stress on increase of respiratory diseases caused by *M. haemolytica* strains.

Publication: Medycyna Wet. (Lublin) 62, 1045–1047, 2006, fig. 1, tab. 1. In Polish, summary in English.

Andrzej Wernicki, Renata Urban-Chmiel, Marta Kankofer, Patryk Mikucki,
Andrzej Puchalski, Stanisław Tokarzewski

EVALUATION OF PLASMA CORTISOL AND TBARS LEVELS IN CALVES AFTER SHORT-TERM TRANSPORTATION

Peroksydacja lipidów u cieląt poddanych działaniu krótkotrwałego stresu transportowego

In the present study calves were subjected to stressful conditions that occur during short-term transportation. In order to describe the influence of transport stress on lipid peroxidation intensity as well as stress parameters plasma cortisol concentration and the indicator of lipid peroxidation processes were estimated.

The experiment was carried out on 9 clinically healthy calves, which were transported on a truck for 2 hours. The blood samples were taken the day before the transportation and on 1st, 3rd, 6th, 9th, 16th and 22nd day after transport. In the obtained plasma, the concentration of cortisol by use of enzyme immunoassay (EIA) was measured. The concentration of thiobarbituric acid-reactive substances (TBARS) was determined using colorimetric method.

The analysis of cortisol concentration in the samples collected from calves from the 1st to the 22nd day after transportation showed typical dynamics with massive increase followed by a gradual decrease. The highest values were observed on 1st and 3rd day after transportation. The analysis of lipid peroxidation processes with respect to TBARS content showed a significant increase on 1st, 3rd day ($P \leq 0.01$) and significant decrease on 6th day after transportation compared to results in plasma obtained before transportation.

These results suggest that short term transportation can induce stressful conditions for cattle leading to lipid peroxidation and oxidative stress which can be evidenced by the variation of plasma cortisol.

Publication: Rev. Med. Vet., 157, 30–34, 2006, fig. 8, tab. 1. In English, summary in French.

Andrzej Wernicki, Renata Urban-Chmiel, Andrzej Puchalski,
Patryk Mikucki, Wojciech Łopuszyński

**EVALUATION OF CLINICAL CASES OF ACUTE RESPIRATORY SYNDROME
IN FEEDLOT CATTLE IN LUBLIN MAKROREGION**

Ocena klinicznych przypadków syndromu oddechowego bydła opasowego
w makroregionie lubelskim

Clinical cases of acute bovine oedema and emphysema in the lung tissue on some feedlot cattle farms in Lublin macroregion have been observed in the last two years. The clinical, histo- and anatomopathological signs were consistent with many articles, where these signs were designated as an acute respiratory distress syndrome (ARDS), acute bovine pulmonary emphysema (ABPE), atypical interstitial pneumonia (AIP), fog fever and also fibrosing alveolitis.

The cases were observed in beef calves collected from individual farms. Depression, expiratory dyspnea, increase of respiratory rates and rectal temperature up to 39.9°C were observed. A very fast progress was characteristic for this clinical syndrome. In comparison to animals without clinical signs, sick calves were in a very good condition and well-fed. At the final stage of the illness in the dorsal and sternum area subcutaneous emphysema was observed. The following activities were carried out for the direct analysis of these clinical cases: the histopathological analysis of pulmonary tissue, the serological examination (ELISA) for presence of anti-BRSV antibodies, and the HPLC analysis of L-tryptophan level in the feed.

Pathology: The changes observable in the section involved mainly lung tissue, their colour consistency and surface. During the anatomopathological section the lungs were falling apart into single lobules. Different microscopic changes were detected in histopathological sections. In some part of resect areas significant hypertrophia in interalveolar septa connected with infiltration, mainly by mononuclear cells were noted. There was also observed significant hypertrophia of pulmonary capillares with erythrocytes inside, atrophia of alveolar epithelium and protein exudate with macrophages, the hyaline membranes inside the alveolar epithelium, exudate inside bronchi and bronchioles, desquamated of epithelium and numerous macrophages could also be seen. A significant part of alveolar walls was not continuous, as a typical picture of lung alveolar emphysema. This emphysema, together with areas of atelectasis suggest a compensatory emphysema, which was the consequence of difficulties in the respiration process. The presence of air bubbles under pleura and in interstitial tissue was another proof of respiratory inefficiency.

The analysis of sera obtained from calves coming from a farm with this syndrome, showed the presence of anti-BRSV antibodies in all of the examined animals. In the sera of calves from other farms, where this respiratory syndrome was not observed, the obtained results were negative. The estimation of L-tryptophan content in feed samples showed the presence of this component in dry matter and did not have any significant influence on the occurrence of respiratory syndromes. The obtained results suggest viral (BRSV) etiology of this respiratory syndrome. However, it is the first case of respiratory syndrome in the country, which has been analysed completely.

Publication: Annales UMCS (Lublin), sectio DD, 59, 197–205, 2006, fig. 6, tab. 2. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

URBAN-CHMIEL R.: The influence of transport stress on oxidative stress parameters in bovine leukocytes.

Ref.: VII Middle European Bujatric Congress, 29 III – 1 IV 2006 Radenci, Slovenia.

Publication: VII Middle European Bujatric Congress. Sloven. Vet. Res. 43, suppl. 10, 241–244, 2006. In English.

WERNICKI A., URBAN-CHMIEL R., PUCHALSKI A.: The occurrence of respiratory syndrome caused by *M. haemolytica* in beef and dairy calves. (Występowanie syndromu oddechowego z udziałem *M. haemolytica* u cieląt ras mięsnych i mlecznych).

Ref.: Conference „Housing with beef and dairy calves.” Wrocław 9 XII 2006.

Publication: Conference December, Proceeding 61–65, 2006. In Polish.

OTHER PUBLICATIONS

URBAN-CHMIEL R.: Transport of calves as a factor influencing basic physiological and biochemical processes. (Transport cieląt jako czynnik wpływający na przebieg podstawowych procesów fizjologicznych i biochemicznych ustroju).

Publication: Inf. Masarski 38–40, 2006. In Polish.

DEC M., WERNICKI A.: Conglutinin, CL-43 and CL-46-three bovine collectins.

Publication: Pol. J. Vet. Sci. 9, 265–275, 2006. In English.

WERNICKI A.: Avian's immunological system. Part. II. Immunoglobulins. (Układ odpornościowy ptaków. Cz. II. Immunoglobuliny).

Publication: Magazyn Wet. 15, Supl., 44–46, 2006. In Polish.

DEPARTMENT OF ANATOMY AND ANIMAL HISTOLOGY

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Stanisław Flieger

SUB-DEPARTMENT OF ANIMAL ANATOMY

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Stanisław Flieger
Prof. extraordin. Dr. habil. Ryszard Eustachiewicz
Prof. Dr. habil. Zbigniew Boratyński

RESEARCH STUDIES (SUMMARIES)

Zbigniew Boratyński, Agnieszka Pedrycz

P-53 PROTEIN AND PROTEINS FROM BCL-2 FAMILY IN THE HEART OF RAT AFTER ADRIAMYCIN ADMINISTRATION. IMMUNOHISTOCHEMICAL EVALUATION

Adriamycin (ADR) – the antineoplastic antibiotics has confirmed proapoptotic activity, mainly on neoplastic cells and young quick dividing cells. Cardiotoxicity of Adriamycin is limiting in antineoplastic therapy. The purpose of study was evaluation of internal pathway of induction of signal to the apoptosis in myocardial cells of rat supplied with Adriamycin. The sign of late cardiotoxicity after Adriamycin is coagulative necrosis. In the present study there was also noticed increased apoptosis of cells in rat heart induced via mitochondrial pathway through activation of p-53 protein and BAX/Bcl-2 ratio > 1 – with prevalence of proapoptotic BAX protein.

Publication: EJPAU, Med. Vet., 9, iss. 2, 11, 2006, fig. 3, tab. 2. In English, summary in English.

Zbigniew Boratński, Agnieszka Pedrycz, Izabela Krakowska

**AUTONOMIC ACCESSORY GANGLIONS IN THE NERVES REACHING THE ORGANS
OF THE UROGENITAL SYSTEM IN THE EWE**

In sheep, the presence of nerve cells concentrations was found in the nerves reaching the organs of the urogenital system which were called autonomic accessory ganglions (AAG) due to the region they occurred. Location of AAG in the studied nerves and their branches is changeable and their shape and size depend on the amount of ganglion cells from which AAG are made. The structure of AAG was described, as well as the appearance of nerve cells being part of it. Moreover, it was noted that most of AAG in the studied nerves or their branches could only be confirmed by microscopic examination. In the discussion the results were compared with those from the earlier studies of other authors and probable functions and role of AAG were discussed in the autonomic peripheral nervous system.

Publication: Bull. Vet. Inst. Pulawy, 50, 183–188, 2006, fig. 11. In English, summary in English.

Izabela Krakowska, Małgorzata Matysek, Jadwiga Jaworska-Adamu

**THE DEVELOPMENT OF THE HIPPOCAMPAL GYRUS DENTATE DURING BOVINE
FOETAL LIFE- OBSERVATION IN THE ELECTRON MICROSCOPE**

Rozwój struktur zakrętu zębatego w życiu płodowym bydła- obserwacje
w mikroskopie elektronowym

The objective of this study was to determine using electron microscope the period of foetal life when proper structures of mature nerve and glial cells in bovine hippocampal gyrus dentate appear and their development in different age groups. Samples for examination under the electron microscope were taken from foetal brains at age of 16, 18, 20, 23 and 29 week of life.

The ultrastructural development in different periods of development was described and results were shown as electronograms. The results of the study show that the ultrastructural development of neurons and glial cells of the studied regions ends in the last trimester of pregnancy.

Publication: Medycyna Wet. (Lublin) 62, 955–956, 2006. In Polish, summary in English.

Iwona Łuszczewska-Sierakowska

**MORPHOMETRICAL ANALYSIS OF NEURONS OF CORPUS AMYGDALOIDEUM'S
NUCLEUS AMYGDALOIDEUM BASO-LATERALIS**

Analiza morfometryczna neuronów jądra podstawno-bocznego ciała migdałowatego świni

Quantitative examinations (morphometrical analysis) were the aim of the research during the process of maturation of nucleus amygdaloideum baso-lateralis. The brain of domestic pig of both sexes (taken during the following period of its life: from 7th to 15th week of intrauterine life, newborn animals, one-month and one-year animals) were used as the material for the examination. The brains were removed and processed conventionally by the microscope. The preparations were stained according to Klüvera-Barrer's method and Nissel's. Histological preparations obtained in this way were used for morphometrical analysis of neurons of corpus amygdaloideum's nucleus amygdaloideum baso-lateralis. Morphometrical examination were carried out by microscope Nikon Eclipse E-600 connected with a camera JVC TK-1380-E and a computer using morphometrical programme MULTI-SCAN-BASE 08.98.

The examination comprised the following parameters: section area of nervous cell and the area of cell nucleus in μm^2 , a nucleo-cellar rate in %, average diameter of nervous cell in μm , volume of nervous cell in μm^3 , a number of neurons per 1 mm^2 , a number of neurons per 1 mm^3 . Morphometrical observation showed that in 9th week of fetal life the cells forming primary corpus amygdaloideum are of identical shape and size. Cell area size in the 9th week of fetal life oscillates around 45 μm^2 . In the 11th week of fetal life the cells, homogenous in the previous periods, undergo considerable differentiation. From homogenous cell mass nucleus structures appear, including nucleus amygdaloideum baso-lateralis.

On the basis of the examined morphometrical parameters, it may be stated that neurons get morphological maturity at the end of fetal life.

Publication: Medycyna Wet. (Lublin) 62, 170–173, 2006. In Polish, summary in English.

Iwona Łuszczewska-Sierakowska

**THE MORPHOLOGY OF NEURONS IN CHOSEN STRUCTURES OF PIG'S CORPUS
AMYGDALOIDEUM IN ONTOGENESIS PROCESS**

Morfologia neuronów w wybranych strukturach ciała migdałowatego świni w procesie ontogenezy

The aim of this research was the development and maturation of neurons in baso-lateral group of corpus amygdaloideum in pig in ontogenesis process.

The brain of domestic pig of both sexes (taken during the following period of its life: from 7th to 15th week of intrauterine life, newborn animals, one-month and one-year animals) was used as the material for examination. The brains were removed and processed conventionally by the microscope. Baso-lateral group of corpus amygdaloideum in domestic pig consists of nucleus amygdaloideum lateralis and nucleus amygdaloideum basalis-lateralis. In the 7th, 8th and 9th week of intrauterine life the primary corpus amygdaloideum is made up of a very big quantity of thickly arranged neuroblasts. Their nuclei are of spherical shape and cell nucleus is surrounded by a very small quantity of cytoplasm. In the 10th, 11th and 12th week of intrauterine life the differentiation of the formery homogenous cells takes place. The group, situated dorsally is corpus amygdaloideum lateralis, while that lying beneath it is corpus amygdaloideum basalis-lateralis. In the next period of the intrauterine life and in newborn animals the appearance of nervous cells forming nucleus amygdaloideum lateralis and nucleus amygdaloideum basalis-lateralis does not change. It may be said that the cells forming the above mentioned nuclei of corpus amygdaloideum in domestic pig have been already morphologically mature in newborn animals.

Publication: Medycyna Wet. (Lublin) 62, 289–293, 2006. In Polish, summary in English.

Agnieszka Pedrycz, Zbigniew Boratyński, Justynian Visconti

**HEAT SHOCK PROTEIN 70 (HSP70) AS A MARKER OF OXYGEN STRESS IN KIDNEYS
OF THE RAT OFFSPRING. IMMUNOHISTOCHEMICAL ASSESSMENT**

Heat shock protein 70 (HSP70) belongs to the family of the chaperones, which protects cellular protein against destruction as a result of damaging factors action, including drugs and environmental pollution.

Adriamycin (ADR) as an antineoplastic antibiotic induces apoptosis especially in cells with intensive proliferation. The cytotoxic activity of ADR is connected with free radicals, that develop the oxygen shock in a cell (HSP70).

In the present study there was used immunohistochemical method to determine HSP70 activity as a marker of cellular and oxygen stress, to check whether stressogenic factors (here ADR) that rat females are exposed to for long time before pregnancy are stressogenic towards kidneys of their offspring 4 weeks after delivery.

Pink-red HSP70(+) reaction observed in cytoplasm of renal tubular epithelial cells was significantly more intensive in the experimental group as compared to control group.

Publication: Bull. Vet. Inst. Pulawy, 50, 231–233, 2006, fig. 2, tab.1. In English, summary in English.

Radosław Szalak, Ryszard Eustachiewicz, Grzegorz Lonc,
Iwona Łuszczewska-Sierakowska

THE MORPHOLOGY AND TOPOGRAPHY OF FORMATIO HIPPOCAMPI IN CHINCHILLA BREVICAUDATA.

Morfologia i topografia tworów hipokampa u szynszyli

The investigations were carried out on 5 brains of chinchillas. The material was fixed in buffered 10% formalin, then dehydrated in ethyl alcohol of rising concentration, embedded in paraffin blocks and cut transversally into 12 micrometer-thick sections. The sections were stained according to Klüver and Barrera's method. Formatio hippocampi classified as a part of rhinencephalon, is located in the medial part of cerebral hemisphere, archedly indenting into the lateral ventricle. The structure described in chinchilla consists of the following: hippocampus and area dentate. The following cortical nervous structure: subiculum and four areas from CA1 to CA4 make formatio hippocampi in chinchilla. Formatio hippocampi as a cortical structure has a laminar build. In subiculum, one can distinguish the following layers: marginal layer, cellular layer I and II. In the structure of the areas CA1, CA2, CA3, CA4, the layers: stratum oriens, stratum pyramidale, stratum radiatum, stratum lacunosum-moleculare are found. Area dentate is a part of formatio hippocampi formed by gyrus dentatus and hilus fasciae dentate. Gyrus dentatus, as a cortical structure, has a laminar build. It is made up of two layers: stratum moleculare and stratum granulosum.

Publication: Medycyna Wet. (Lublin) 62, 444–447, 2006. In Polish, summary in English.

OTHER PUBLICATIONS

KRAKOWSKA I., BORATYŃSKI Z.: Anatomy of the Rabbit [In:] Rabbit's diseases. (Zarys anatomii [w:] Choroby królików).

Publication: Państwowe Wydawnictwo Rolnicze i Leśne, Warszawa 2005, pp. 11–25. In Polish.

MADEJ B., BURDAN F., DUDKA J., RADZIKOWSKA E., ŁUSZCZEWSKA-SIERAKOWSKA I., POZNAŃSKI P., CIECHANEK R., PRAŻMO W., MACIEJEWSKI R.: Role of intraperitoneally administered physiological saline in acuta pancreatitis therapy. (Rola do-otrzewnowego podawania soli fizjologicznej w leczeniu ostrego zapalenia trzustki).

Publication: Medycyna Wet. (Lublin) 62, 1443–1445, 2006. In Polish, summary in English.

RADZIKOWSKA E., MADEJ B., ŁUSZCZEWSKA-SIERAKOWSKA I., BURDAN F., DĄBROWSKA A., MACIEJEWSKI R.: Role of estrogen in the etiology of peliosis hepatis.

Publication: Medycyna Wet. (Lublin) 62, 395–396, 2006. In English, summary in English.

SUB-DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

12 Akademicka, Lublin

Head: Prof. extraordin. Dr habil. Regina Cybulska
Dr. habil. Jadwiga Jaworska-Adamu

RESEARCH STUDIES (SUMMARIES)

Krzysztof Lutnicki, Ewa Szpringer, Jan Wróbel, Jadwiga Jaworska-Adamu

VERAPAMIL AND CALCIUM IONS IN ETHANOL EVOKED GASTRIC MUCOSA INJURY

The effects of calcium ions were studied on the generation of free radicals and prostaglandin synthase activity in rat gastric mucosa after ethanol (50%) injury. Increased levels of peroxidation products (malonyl dialdehyde, hydroperoxides and conjugated dienes) were assessed. Verapamil administered before ethanol increased ulcerogenic activity of ethanol and caused decrease in the levels of peroxidation products in gastric mucosa. Bay K 8644 showed some protective effect to gastric mucosa and reduced the level of peroxidation products. Ethanol completely abolished the prostaglandin synthase, Bay K 8644 evoked the synthase activity growth. Cumene hydroperoxide administered intragastrically caused only slight incubation of prostaglandin synthase, however, it induced massive injures of gastric mucosa.

Publication: Annales UMCS (Lublin), sectio DDD, 19, 275–281, 2006, fig. 6, tab. 1. In English, summary in English.

Agata Wawrzyniak-Gacek, Jarosław Pawelec, Regina Cybulska

**IRON CONTENT IN VARIOUS TYPES OF OLIGODENDROGLIA
IN THE CORTEX FRONTALIS OF RAT'S BRAINS**

Zawartość żelaza w różnych typach oligodendrogleju w korze czołowej mózgowia szczurów

The aim of the study was to trace the content and location of iron in three types of oligodendrocytes in the cortex frontalis of the brain of thirty-day old Wistar rats. The assessment was made in a LEO OMEGA 912 AB electron microscope, using the ESI spectroscopy method of mapping iron (Electron Spectroscopic Imaging). Differentiated iron content in the three types of examined cells was indicated. The highest accumulation of iron was found in dark oligodendrocytes, lower in medium oligodendrocytes while, the lowest in the light oligodendrocytes. The paper discusses the dependence between cytoplasm density and iron content in the investigated types of oligodendroglia.

Publication: Medycyna Wet. (Lublin) 62, 957–959, 2006, fig. 6. In Polish, summary in English.

Agata Wawrzyniak-Gacek, Jarosław Pawelec, Regina Cybulska

**IRON CONTENT IN VARIOUS TYPES OF OLIGODENDROGLIA
IN THE CORPUS CALLOSUM AND CAPSULA INTERNA OF RAT BRAINS**

Zawartość żelaza w różnych typach oligodendrogleju w obszarze ciała modelowatego i torebki wewnętrznej mózgowia szczurów

The aim of the study was to trace the content and location of iron in three types of oligodendrocytes in the corpus callosum and capsula interna of the brains of thirty-day old Wistar rats. The evaluation was made by Leo Omega 912 AB electron microscope, using the spectroscopy method of mapping iron ESI (Electron Spectroscopic Imaging). A variety within the iron content of the three different types of examined cells was indicated. The highest accumulation of iron was recorded in the oligodendrocytes, lesser – medium and the least – light oligodendrocytes. The paper discussed the relation between cytoplasm density and iron content in the studied types of oligodendroglia.

Publication: Medycyna Wet. (Lublin) 62, 827–829, 2006, fig. 6. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

CYBULSKA R., DMOWSKA M., PIERSIAK T., SCHOENBORN R., JAWORSKA-ADAMU J., WLAŻ P.: Hippocampal pathology in the polycarpine model of epilepsy: neuronal density of CA1, CA3 and DG sectors of adenosine-preconditioned rats.

Ref. XV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS Molecular and physiological aspects of regulatory processes of the organism, Cracow, 1–2 VI 2006.

Publication: Materials of XV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS, 102–104, 2006. In English.

CYBULSKA R., JAWORSKA-ADAMU J., DMOWSKA M., SCHOENBORN R., WLAŻ P.: Pharmacological preconditioning with adenosine in the brain. Molecular and physiological aspects of regulatory processes of the organism.

Ref. XV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS Molecular and physiological aspects of regulatory processes of the organism, Cracow, 1–2 VI 2006.

Publication: Materials of XV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS, 105–106, 2006. In English.

DEPARTMENT OF BIOCHEMISTRY AND ANIMAL PHYSIOLOGY

12 Akademicka, Lublin

Head: Prof. extraordin. Dr habil. Marta Kankofer

SUB-DEPARTMENT OF ANIMAL PHYSIOLOGY

12 Akademicka, Lublin

Supervisor: Prof. Dr habil. Marta Kankofer
Dr. habil. Iwona Puzio

RESEARCH STUDIES (SUMMARIES)

Barbara Badzian

INFLUENCE OF WATER SOLUBLE VITAMINS ON ABSORPTION OF SELECTED EXOGENOUS AMINO ACIDS IN CHICKEN

Wpływ witamin rozpuszczalnych w wodzie
na wchłanianie wybranych aminokwasów egzogennych u kurcząt

The aim of the study was to show whether water soluble vitamins included in fodder may differentiate the absorption of exogenous amino acids from entrails. Tests were done on alive broiler chickens (age 2–4 months) in which loops of small intestine were done. Physiological liquid included amino acids such as: L-threonine, L-valine, L-methionine, L-lysine, L-histidine, L-phenylalanine, L-leucine, L-isoleucine or amino acids with water soluble vitamins: thiamin, riboflavin, pyridoxine, nicotine acid, panthotenic acid, cholin, biotin, vitamin C and folic acid. The method of liquid chromatography before and after the flow through the loop after 30 min was used to determine the concentration of amino acids in perfusion liquid. The results of this study may indicate a stimulatory

effect of the vitamins on absorption of amino acids in chickens. The influence on absorption of amino acids was the highest when water soluble vitamins were used together in doses 10, 50, 100 mg/l. There was noted a significant influence on absorption of exogenous amino acids for threonine, valine, histidine and isoleucine after application of thiamin, riboflavin, cholin and biotin used in separated liquid. The changes in absorption of exogenous amino acids depending on water soluble vitamins may stimulate the development and growth in chicken.

Publication: Medycyna Wet. (Lublin) 62, 1051–1055, 2006, tab. 3. In Polish, summary in English.

Barbara Badzian

**ABSORPTION OF SOME EXOGENOUS AMINO ACIDS IN ENTRAILS OF CHICKEN
AFTER APPLICATION OF OUABAIN AND WATER SOLUBLE VITAMINS**

Wchłanianie wybranych aminokwasów egzogennych w jelicie u kurcząt po zastosowaniu ouabainy i witamin rozpuszczalnych w wodzie

The aim of the study was to examine the influence of water soluble vitamins such as: thiamin, riboflavin, pyridoxine, vitamin C, folic acid, panthoten acid, nicotine acid, biotin and cholin on absorption of amino acids from entrails in chickens and explanation of this process. Tests were done on 160 alive broiler chicken, breed Hybro G (age 2-4 months). The absorption of amino acids was determined by the method of perfused loops of small intestine. Saline including amino acids such as: L-threonine, L-valine, L-methionine, L-lysine, L-histidine, L-phenylalanine, L-leucine, L-isoleucine and water soluble vitamins in dose 100 mg/l was passed through the loops. Ouabain-blocker of $\text{Na}^+\text{K}^+\text{ATP-ase}$ was added to perfusion fluid in the order to block active transport in intestine. Next, level of amino acids was measured by the method of liquid chromatography. The experiment demonstrated, that water soluble vitamins undoubtedly influenced exogenous amino acid absorption from entrails in chickens. Amino acid absorption in the presence of vitamins increased and the proof of their stimulating effect is the fact, that after ouabain administration in the presence of vitamins, they caused the inhibition of blocked effect of active transport. Absorption of amino acids after application of ouabain was lower as compared to the presence of ouabain and vitamins.

Publication: Acta Sci. Pol. Med. Vet. 5, 95–102, 2006, tab. 1. In Polish, summary in English.

Grażyna Bielecka, Waldemar Korol, Iwona Puzio

**EFFECT OF YELLOW LUPIN SEEDS AND RAPE „00” SEEDS ON PERFORMANCE
AND SOME BLOOD INDICES IN BROILER CHICKENS**

Wpływ nasion łubinu żółtego i rzepaku „00” na odchów oraz wybrane wskaźniki
krwi kurcząt brojlerów

The aim of the study was to investigate the influence of mixtures with de-hulled yellow lupin seeds and dehulled rape „00” seeds on the performance and some haematological and biochemical indices of blood in broiler chickens. The research was carried out on 96 Astra B broiler chickens during the period from 1 to 49 day of life. The chickens were divided into 4 groups with 24 birds in each group. Group I – the control – was fed typical mixed wheat-soybean. Dehulled yellow lupin seeds and dehulled rape „00” seeds were used in the experimental diets. In groups III and IV soybean meal protein was replaced by lupin meal protein in quantities of 50% in starter feed and 100% in grower. Dehulled rape „00” seeds were added in quantity of 10% to the diet for groups II and IV. The following were measured: indices of rearing – body weight, feed and total protein consumption; haematological parameters – erythrocytes, leucocytes, Ht, MCV, MCHC, MCH and biochemical parameters – total protein and uric acid in blood plasma. Chickens fed the diet with the parallel addition of dehulled yellow lupin and rape „00” seeds had the highest body weight (2.172 kg) and the lowest feed and protein intake (1.989 kg/kg and 0.385 kg/kg) per body gain. Rearing results obtained in the other experimental groups were comparable with controls. The influence of experimental feeding on haematological indices was not demonstrated. In the respective groups the content of uric acid and total protein in blood plasma were within the limits of physiological standards. The obtained results indicate that dehulled lupin seeds and dehulled rape „00” seeds are useful for broiler chickens feeding.

Publication: Medycyna Wet. (Lublin) 62, 420–422, 2006, tab. 3. In Polish, summary in English.

Marek Bieńko, Radosław P. Radzki, Iwona Puzio, Małgorzata Kapica,
Rafał S. Filip, Marta Pawłowska

**INFLUENCE OF BETA-HYDROXY BETA-METHYLBUTYRATE (HMB)
ON THE STRUCTURAL STRENGTH OF BONES**

Beta-hydroksy beta-metyloasmańlan (HMB) – czynnik wpływający na właściwości wytrzymałościowe tkanki kostnej szczurów

HMB, or beta-hydroxy beta-methylbutyrate, is a metabolite of the amino acid leucine and is produced naturally by the human body. HMB is produced from a metabolite of leucine, called ketoisocaproate (KIC), by the enzyme KIC-dioxygenase.

The aim of the study was to determine the effect of beta-hydroxy beta-methylbutyrate (HMB) on structural strength of bone and bone mineral density (BMD) of femur and lumbar vertebrae (L2–L4) in rats with established osteopenia. The experiment was conducted on 30 female Wistar rats at the age of 3 months and initial body weight about 250 g. After 60 days of experiment the femur was isolated and three point bending test and BMD was performed. Lumbar vertebrae (L2–L4) was also investigated.

Beta-hydroxy beta-methylbutyrate added to the drinking water has positive effects on BMD in femur, lumbar vertebrae and bone strength in ovariectomized Wistar rats.

Publication: Medycyna Wet. (Lublin), 62, 963–965, 2006. In Polish, summary in English.

Katarzyna Dudek, Ewa Śliwa, Marcin R. Tataro

**CHANGES IN BLOOD LEUKOCYTE PATTERN IN PIGLETS FROM SOWS
TREATED WITH GARLIC PREPARATIONS**

Changes in white blood cell pattern in piglets, as a consequence of administration of aged garlic extract (AGE) or allicin to sows during pregnancy and lactation, were presented. The experiment was performed on piglets born by sows of Large Polish White breed. Animals were kept under standard rearing conditions with free access to fresh water and well balanced diet. The piglets obtained from 18 sows were divided into three groups: one control and two experimental ones. Within those groups there were formed 7 age-differentiated subgroups (each subgroup n = 6): non-suckling newborn piglets (0 d) and at the

age of 1, 3, 7, 14, 28 and 35 d. Starting from 91 d of pregnancy up to the piglets' weaning on 28 d of their life, the sows were daily administered AGE per os at the dosage of 10 ml/100 kg b.w. or allicin at the dosage of 1.6 mg/100 kg b.w., whereas the controls received 10 ml/100 kg b.w. of vehiculum. The blood samples were collected from the piglets on days 0, 1, 3, 7, 14, 28 and 35 of their life and analysed immediately. In most cases the results showed a significant increase in the white blood cell counts in different periods of piglets' life. This indicates improvement in animal performance following treatment with the investigated garlic preparations.

Publication: Bull. Vet. Inst. Pulawy 50, 263–267, 2006, tab. 1. In English, summary in English.

Rafał S. Filip, Lech Panasiuk, Agnieszka Haratym-Maj,
Radosław P. Radzki, Marek Bieńko, Iwona Puzio

**SERUM LIPID PROFILE AND METABOLIC SYNDROME OCCURRENCE AMONG
OBESE RURAL WOMEN FROM LUBLIN REGION (EASTERN POLAND)**

Obesity is a multivariate syndrome which can negatively affect whole body functioning. It is most common in highly developed countries, and in recent years a progressive increase in obesity occurrence has been noticeable. The objective of the study was to assess serum lipid profile and metabolic syndrome occurrence among obese rural women from Lublin Region in eastern Poland. The study was conducted in the Institute of Agricultural Medicine in Lublin (IAM). All subjects had a negative history of diseases and treatment that could affect serum lipid profile or glucose measurements. The inclusion criterion for the study group was overweight and obesity, defined as a body mass index above 25 (BMI>25) and living in rural area; 44 women participated in the study. There were no women fulfilling the criteria or who had a history of incorrect fasting glucose (IFG) or incorrect glucose tolerance (IGT). In contrast, the prevalence of arterial hypertension (or treatment) was high – 53%. 22.7% women had normal serum TC values. The proportion of those with hyper-LDL-C was 38.6% and with hyper-TG – 18.2%. 20.5% of studied women had incorrect serum HDL-C levels, and in 15.9% hypo- HDL-C was accompanied by high serum TC levels. Analysis of correlation showed that serum TC was positively correlated with both LDL- and HDLC. 55% of the studied obese or overweight women had at least 2 additional components of the metabolic syndrome.

Publication: Ann. Agric. Environ. Med. 13, 77–80, 2006, tab. 3. In English, summary in English.

Małgorzata Kapica, Daniel Laubitz, Iwona Puzio,
Anna Lubańska, Romuald Zabielski

**THE GHRELIN PENTAPEPTIDE INHIBITS THE SECRETION
OF PANCREATIC JUICE IN RATS**

Ghrelin, a 28 amino acids polypeptide was recognized as an endogenous ligand for the growth hormone secretagogue receptor. It turned out that the entire sequence of ghrelin is not necessary for performing the above-mentioned functions. It was suggested that 5 residues (Gly-Ser-Ser(n-octanoyl)-Phe, pentaghrelin) constituted functionally active part of the full-length polypeptide. Ghrelin-28 was found to inhibit pancreatic enzyme output in rats, though the effect of pentaghrelin was not studied so far. The study aimed to determine the involvement of pentaghrelin in pancreatic juice secretion in anaesthetized rats. Male Wistar rats (220 ± 20 g body weight, b. wt.) were anesthetized, the external jugular vein and common biliary-pancreatic duct were cannulated. Pentaghrelin boluses (iv, 1.2, 12, and 50 nmol kg^{-1} b. wt.) were injected every 30 min with or without CCK-8 infusion, duodenal mucosal CCK₁ receptor blockade with tarazepide, vagotomy and capsaicin pretreatment. Pentaghrelin boluses reduced the volume of pancreatic-biliary juice, protein and trypsin outputs both under basal and CCK-8-stimulated conditions in a dose-dependent manner. However, exogenous pentaghrelin failed to affect the pancreatic secretion in rats subjected to vagotomy, capsaicin deactivation of afferents or pretreatment with Tarazepide. In conclusion, pentaghrelin may control exocrine pancreas secretion by affecting duodenal neurohormonal mechanism(s) involving CCK and vagal nerves in rats.

Publication: J. Physiol. Pharmacol. 57, 691–700, 2006. In English, summary in English.

Małgorzata Kapica, Małgorzata Kwiecień, Iwona Puzio, Marek Bieńko,
Radosław P. Radzki, Marta Pawłowska

INFLUENCE OF SOME HERBS ON ACTIVITY OF DIGESTIVE ENZYMES IN CHICKEN

Wpływ dodatku wybranych ziół na aktywność enzymów trawiennych u kurcząt rzeźnych

The aim of the experiments was to determine the influence of the addition of herbs to the diets on the total protein content and the activity of the digestive enzymes in broiler chickens. The experiments were carried out on 210 broiler ross chickens (in period from 1st to 42nd day) randomly divided into 7 groups: control and 6 experimental. Experimental chickens were fed the diet with 2%

addition of: hop (gr. I), linden (gr. II), melissa (gr. III), pansy (gr. IV), peppermint (gr. V), urtica (gr. VI). At the 42nd day, 10 chickens (5 males and 5 females) were chosen from each group which body weight was the closest to the average of particular group. The body weight (g), and after slaughter also relative liver weight (g/100 BW) and the content of abdominal fat (% of BW) were examined. The proventriculus was isolated and mucosa membrane was removed from them. After homogenization of mucosa membrane the total proteolytic activity and total content of proteins in it were analyzed.

The highest body weight was indicated in chickens receiving the addition of urtica. However, the addition of the linden caused the 20% reduction of the body weight in males and 11% in females. Considerably lower body weight was also observed in males fed the diet with hop. The addition of hop caused the increase of liver weight and abdominal fat content. Statistically considerable increase of the total protein content in mucosa membrane of proventriculus in groups fed the diet with linden, melissa, pansy, peppermint and urtica was observed. The analysis of the proteolytic activity of the mucosa membrane showed its considerable decrease in chickens of both sexes when the diet was enriched by the addition of linden, melissa, pansy, peppermint and in females fed a mixture with addition of hop and urtica.

Publication: Medycyna Wet. (Lublin) 62, 1048–1050, 2006. In Polish, summary in English.

Małgorzata Kapica, Iwona Puzio, Jose Valverde Piedra,
Sylvia E. Szymańczyk-Kwapik, Marta Pawłowska

CONCENTRATION OF IGF-1 IN PLASMA OF LECTIN ORAL ADMINISTRATION IN NEOTAL PERIOD

Zawartość insulinopodobnego czynnika wzrostu-1 (IGF-1) w osoczu krwi szczurów
w okresie postnatalnym w warunkach doustnego podawania lektyny

The aim of the study was to determine the effect of lectin administration on blood plasma IGF-1 concentration in the postnatal life of rats. The next aim was to examine the biological activity of two kinds of lectin preparations obtained in different technological processes. The study was conducted on 54 Wistar rats. At the age of 11 days control rats were given saline intragastrically, while the experimental rats received phytohemagglutinin and suilektin[®] solution 0.2-0.3 ml (100 mg/kg b.wt.), respectively. Blood plasma IGF-1 concentration was measured radioimmunologically (RIA) (Diagnostic System Laboratories, Webster, Texas, USA). Lectin administration during the neonatal period results in increased body weight and the weight of the stomach, pancreas and liver. Blood

plasma IGF-1 concentration increased with animal age, however, lectin administration does not induce significant changes in IGF-1 concentration.

Publication: Folia Univ. Agric. Stetin, Zootechnica 250, 97–102, 2006. In Polish, summary in English.

Marta Pawłowska, Jose Valverde Piedra, Sylwia E. Szymańczyk-Kwapik,
Małgorzata Kapica, Tomasz Piersiak, Iwona Puzio

**THE EFFECT L-ALANYL-L-GLUTAMINE ON THE DEVELOPMENT
AND MINERALIZATION OF THE FEMUR IN THE NEONATAL PIG**

Wpływ L-alanylo-L-glutaminy na rozwój i mineralizację kości udowej prosiąt
w okresie neonatalnym

The aim of the study was investigate the effect of L-alanyl-L-glutamine oral administration of the femur structure, geometric and mechanical properties and mineralization during the neonatal life in the pig. The studies were carried out on 14 piglets between the 1st and the 21st day of life. The piglets were sacrificed at 21st days of age and bones were striped out for further analyses. Bones physical (maximum elastic force, maximum strength) and geometric (cross sectional area, second moment of inertia, mean relative wall thickness) properties and mineral density were analyzed. Bone mineral density (BMD) was measured in the proximal and distal epiphysis using DEXA method.

During the postnatal period it was stated that the values of geometric, physical and BMD parameters were increased in the femora of piglets that were orally administrated Ala-Gln solution during 21 day of life, compared to the femora of control animals.

Publication: Folia Univ. Agric. Stetin, Zootechnica 250, 119–125, 2006, fig. 1, tab. 1. In Polish, summary in English.

Iwona Puzio, Małgorzata Kapica, Rafał S. Filip, Marek Bieńko,
Radosław P. Radzki

**FUNDECTOMY EVOKES ELEVATED GASTRIN
AND LOWERED GHRELIN SERUM LEVELS ACCOMPANIED BY DECREASE
IN GEOMETRICAL AND MECHANICAL PROPERTIES OF FEMORA IN RATS**

The objective of the study was to characterize physical parameters of bones in rats 12 weeks after fundectomy. Femora were isolated for the measurement of

their physical and geometrical parameters. The three-point bending test was used to determine mechanical bone properties – maximum strength and maximum elastic force. Bone mineral density was measured in shaft with dual energy X-ray absorptiometry employing a high-resolution scanning protocol and programme for small animals. Structural parameters were also measured – cross-sectional area, second moment of inertia, cortical area, cortical thickness, cortical area index and cortical index. The circulating concentration of gastrin, ghrelin, and calcium were determined, too. The gastric resection was not accompanied by changes in body weight, mass and length of the femur. Physical and geometrical parameters of the bone were reduced by fundectomy. Serum gastrin concentration was 3.8 times higher and serum total ghrelin concentration was about 30 times lower in fundectomised rats than in controls.

Publication: Bull. Vet. Inst. Pulawy 49, 69–73, 2005, tab. 4. In English, summary in English.

Iwona Puzio, Małgorzata Kapica, Marta Pawłowska, Jose Valverde Piedra, Gustaw Kulasek, Zbigniew Gajewski, Jacek Wilczak, Romuald Zabielski

CHARACTERISTICS OF PHYSICAL AND STRUCTURAL PARAMETERS OF BONES IN NEONATAL PIGLETS

Charakterystyka cech fizycznych i strukturalnych kości kończyn nowo narodzonych prosiąt

The aim of the present study was to estimate the influence of feeding pregnant and lactating sows with a diet supplemented with L-carnitine, taurine, vitamin E and blend of linden, rapeseed and flaxseed on the development of physical and structural parameters of bones in neonatal piglets. The study was carried out on 36 piglets from sows fed standard or improved diet. The supplemented feed (L-carnitine, taurine, vitamin E and blend of linden, rapeseed and flaxseed) was given from the gestation 80 day. The piglets were sacrificed on 1, 2 and 4 d of life. Femur and humerus were isolated and measured for weight, length, BMC, BMD, physical and architectural parameters. On 4 d piglets the body weight, mass and length of both bones and maximum strength, resilience limit and architectural parameters of humerus were higher in experimental piglets than in controls. In conclusion, the supplementation of pregnant and lactating sows diet with bioactive substances influenced the development of bones in the neonatal piglets.

Publication: Folia Univ. Agr. Stetinensis, Zootechnica 250, 109–118, 2006, fig. 2, tab. 4. In Polish, summary in English.

Radosław P. Radzki, Marek Bieńko, Małgorzata Kapica, Iwona Puzio,
Piotr Dobrowolski, Rafał S. Filip

**EFFECT OF β_2 -ADRENERGIC RECEPTOR AGONIST CLENBUTEROL
ON THE MINERALIZATION OF TIBIAE IN RATS WITH ESTABLISHED OSTEOPENIA**

Wpływ agonisty receptorów adrenergicznych β_2 -clenbuterolu na mineralizację kości piszczelowej
szczura w warunkach ustalonej osteopenii

The purpose of the study was to determine the effect of β_2 -adrenergic receptor agonist – clenbuterol on mineralization of tibiae of female rats with established osteopenia, induced by bilateral ovariectomy. The experiments were conducted on 30 female Wistar rats at the age of 3 months and initial body weight about 250 g. After acclimatization the animals were submitted to sham-operation – SHO (n = 10) and bilateral ovariectomy – OVX (n = 20). After 60 days of osteopenia induction the ovariectomized rats were subsequently divided into a group fed the standard diet (n = 10) and the other supplied with dietary clenbuterol in the dose of 5 mg/kg. After 14 days of experiment, the tibiae were isolated and tested using DEXA densitometer, peripheral quantitative computer tomography (pQCT) and three-point bending test. The obtained results proved, that 14 days of clenbuterol treatment significantly increased mechanical properties content and density of mineral, both planar (BMD) and volumetric (vTotBMD) of tibiae of ovariectomized rats.

Our observation proved the key role of the adrenergic system in regulation of bone tissue metabolism. However, some further studies are recommended to explain more thoroughly the relationship between adrenergic system and bone metabolism and potential usefulness of adrenergic receptors agonists as clenbuterol in both prophylactic and treatment of metabolic bone diseases.

Publication: Medycyna Wet. (Lublin) 62, 824–826, 2006, tab. 3. In Polish, summary in English.

Tomasz Skrzypek, Jose Valverde Piedra, Henryk Skrzypek,
Waldemar Kazimierczak, Jarosław Woliński, Romuald Zabielski

**THE DEVELOPMENT OF SMALL INTESTINE OF PIGLETS FEEDING
BY NATURAL AND ARTIFICIAL MILK DURING THE FIRST WEEK OF LIFE**

Rozwój jelita cienkiego u prosiąt karmionych mlekiem matki i preparatem mlekozastępczym
w pierwszym tygodniu życia

The present study aimed to investigate changes in the intestinal mucosa structure in neonatal piglets fed sow colostrum and milk and piglets fed artificial

milk formula diet in the first week of life. The observation and analysis was made using scanning electron microscopy. Analysis revealed a number of disadvantageous changes in piglets fed artificial diet. The shape and height of villi changed. The extrusion zone appeared earlier in the sow reared than in milk formula fed piglets. The architecture of small intestine mucosa underwent structural changes, which could result in reducing the absorptive area and epithelial integrity in the small intestine.

Publication: Folia Univ. Agric. Stetinensis Zootechnica 250, 67–80, 2006. In Polish, summary in English.

Ewa Śliwa

**EFFECT OF SIMULTANEOUS VERSUS APART ADMINISTRATION
OF DEXAMETHASONE AND ALPHA-KETOGLUTARATE ON GROWTH HORMONE,
CORTISOL AND INSULIN-LIKE GROWTH FACTOR-I IN PIGLETS**

The aim of this study was to determine the influence of dexamethasone and α -ketoglutarate administered simultaneously and separately during both prenatal and postnatal life on the serum level of cortisol, growth hormone, and insulin-like growth factor (IGF-I) in 30-d-old piglets. The experimental procedure was conducted from the 91st d of pregnancy to the parturition. The sows were administered orally AKG at the dosage of 0.4 g/kg b. w./d (AKG group), injected *i. m.* with dexamethasone at the dosage of 3 mg/sow/48 h (Dex group), and administered AKG simultaneously with dexamethasone (Dex + AKG group), similarly to the other groups. Newborns were divided into groups according to their mothers treatment to continue dexamethasone and AKG administration. The first group of neonatal piglets was administered orally AKG at the dosage of 0.4 g/kg b. w./d (AKG group) and the second group was injected *i.m.* with dexamethasone (Dex group) at the dosage of 0.5 mg/ kg b.w./48 h. The third group of piglets received dexamethasone simultaneously with AKG (Dex + AKG group), similarly to the other experimental piglets` groups. Experiment lasted up to 30 d of piglets` postnatal life. Piglets being under influence of dexamethasone during 24 last d of pregnancy and 30 d of their postnatal life showed final body weight lower by 38% compared with AKG treated piglets and by 35% compared with the Dex + AKG group. Moreover, the levels of growth hormone, IGF-I and cortisol were the lowest in the Dex group. There was significant correlation between body weight and IGF-I serum level ($r = -0.92$). The concentrations of IGF-I and growth hormone were the highest in AKG group. Levels of GH and IGF-I were significantly correlated in AKG group ($r = 0.7$) and Dex+AKG ($r = 0.64$). More-

over, the body weight and IGF-I were positively and significantly correlated in AKG group ($r = 0.67$). Simultaneous administration of α -ketoglutarate with dexamethasone improved body weight gain and enhanced the cortisol serum level of piglets compared with animals treated with dexamethasone alone which significantly decreased cortisol serum level.

Publication: Bull. Vet. Inst. Pulawy, 50, 205-210, 2006, tab. 3. In English, summary in English.

Ewa Śliwa, Marcin R. Tatar, Hubert Nowakowski,
Stefan G. Pierzynowski, Tadeusz Studziński

**EFFECT OF MATERNAL DEXAMETHASONE AND ALPHA-KETOGLUTARATE
ADMINISTRATION ON SKELETAL DEVELOPMENT DURING THE LAST THREE
WEEKS OF PRENATAL LIFE IN PIGS**

The objective of this study was to determine the effect of dexamethasone and alpha-ketoglutarate administered separately or simultaneously to sows during the last three weeks of pregnancy on the skeletal development in fetuses. Immediately after birth blood samples were collected from non-suckling piglets for alkaline phosphatase and osteocalcin determinations and the humeri were isolated. Bone mineral density and bone mineral content of humeri and the geometric and mechanical properties were evaluated. Dexamethasone and AKG administered separately to pregnant sows during the last 24 days of prenatal life decreased BMD, BMC and geometric and mechanical properties of humeri. The bone mineral density and mechanical and geometrical properties of humeri indicate an inverse effect of maternal separate or simultaneous administration of AKG and dexamethasone to sows on bone development during the last 24 days of prenatal life.

Publication: J. Maternal-Fetal Neonatal Medicine 19, 489-493, 2006. In English, summary in English.

Ewa Śliwa, Marcin R. Tatar, Stefan G. Pierzynowski

**TOTAL CHOLESTEROL, GLUCOSE AND ELECTROLYTES IN PIGLETS' SERUM
AFTER ALPHA-KETOGLUTARATE (AKG) AND DEXAMETHASONE TREATMENT
DURING PRENATAL AND NEONATAL LIFE**

The objective of this study was to determine the effect of dexamethasone (Dex) and α -ketoglutarate (AKG) on the total cholesterol, glucose, Na^+ , Cl^- , total

Ca and K⁺ levels in serum in newborn and neonate piglets. The blood samples were collected from newborn non-suckling piglets born by sows administered from the 91st d of pregnancy to the parturition with AKG and/or Dex (AKG – 0.4 g/kg BW/every day, orally; Dex – 3 mg/sow, *i.m.* every second day). The second blood sampling was from the same piglets on 14 d of their life after further Dex and AKG administration in the same way as in sows. The serum total cholesterol level of newborn piglets from controls was the highest and reached the value of 40.6 mg%, whereas the lowest was in AKG group (27.9 mg%). The total cholesterol serum level of the 14-d-old piglets in AKG + Dex and Dex groups reached 304 and 273 mg%, respectively, whereas in the AKG group only 155 mg%, while in the control 197 mg%. The decreased total serum cholesterol level in newborns and neonatal piglets' serum after maternal and neonatal administration of AKG indicate the same lowering effect. AKG given to sows during the last weeks of pregnancy decreased Na⁺, Cl⁻ and K⁺ levels in newborns serum, but it did not influence the levels after further administration to piglets during their 14 d of neonatal life. Increased serum K⁺ and total Ca levels in 14-d-old piglets from both groups treated with dexamethasone (Dex and AKG + Dex groups) and Cl⁻ loss in Dex group were observed.

Publication: Bull. Vet. Inst. Pulawy, 50, 561–566, 2006. In English, summary in English.

Christer Tannergren, Lena Evilevitch, Stefan Pierzynowski,
Jose Valverde Piedra, Björn Weström, Kennedy Erlwanger,
Marcin R. Tatara, Hans Lennernäs

**THE EFFECT OF PANCREATIC AND BILIARY DEPLETION
ON THE *IN VIVO* PHARMACOKINETICS OF DIGOXIN IN PIGS**

Several transporter systems in the liver and intestine are known to change their expression and function during cholestatic disease states. The objective of the present *in vivo* study was to investigate the effect of biliary depletion, as a method to mimic cholestasis, on the bioavailability and disposition of digoxin in biliary and pancreatic duct cannulated pigs. The study was divided in two parts. In the first part, a solution of 10 microg/kg digoxin was administered intravenously to the cannulated pigs with intact enterohepatic circulation (Control) and during depletion of the bile and pancreatic juice. In the second part, the same dose of digoxin was administered intraduodenally with intact enterohepatic circulation (Control) and during depletion of either bile or pancreatic juice or both. Biliary deple-

tion decreased the flow of bile and pancreas juice as well as the amount of digoxin appearing in the bile. Deprivation of both bile and pancreas juice significantly increased the bioavailability of digoxin, the plasma AUC after enteral administration increased from 17.6 ± 4.2 nmol/lh (Control) to 29.6 ± 8.3 nmol/lh ($P < 0.05$). The biliary clearance decreased significantly, from 0.22 ± 0.11 l/h/kg (Control) to 0.04 ± 0.03 l/h/kg during pancreatic and biliary depletion ($P < 0.05$). There was a significant decrease in elimination half-life ($P < 0.05$) and volume of distribution ($P < 0.01$) during the depletion experiments while the systemic clearance remained unchanged. The results clearly suggest that biliary depletion trigger a short-term downregulation, most likely posttranscriptionally mediated, of a sinusoidal uptake transporter in the liver, possibly a pig ortholog of OATP.

Publication: Eur. J. Pharm. Sci. 29, 198–204, 2006, fig. 5, tab. 3. In English, summary in English.

Marcin R. Tatar, Ewa Śliwa, Witold Krupski, Adam Brodzki,
Kazimierz Pasternak

ORNITHINE ALPHA-KETOGLUTARATE INCREASES MINERALIZATION AND MECHANICAL PROPERTIES OF TIBIA IN TURKEYS

Skeletal disorders in rapidly growing poultry are commonplace. This study was performed to investigate the effect of ornithine alpha-ketoglutarate (OKG) administration during the last 7 weeks of life on structural properties, mineralization, and mechanical endurance of skeleton in turkeys at slaughter. Healthy HB Medium Bronze female turkeys were randomly assigned to two weight-matched groups at the age of 12 weeks. OKG was administered orally to the experimental group ($n = 17$) at the dose of 0.4 g/kg body weight per day, while the control group ($n = 16$) received an equal dose of the vehicle. The turkeys were slaughtered at the age of 19 weeks and the tibiae were isolated for analysis. The effect of OKG on skeletal system development in turkeys was evaluated in relation to both geometrical and mechanical properties as well as quantitative computed tomography (QCT). Free amino acids concentrations were assessed with the use of ion-exchange chromatography. Significantly increased bone mineral density of the trabecular and the cortical bone of tibia in the turkeys given OKG for the last 7 weeks of production cycle were observed ($P < 0.05$). OKG administration improved mechanical endurance of the tibia estimated by the three-point bending test ($P < 0.01$). Plasma amino acid analyses showed increased level of aspartate, proline, alanine, valine, isoleucine, leucine, and ornithine (all $P < 0.05$) after OKG treatment, whereas cystathionine concentration was decreased ($P = 0.03$). Ob-

tained results indicate that oral OKG administration has beneficial effects on skeletal development in fast growing turkeys and this effect is connected with increased amino acid synthesis. These observations may serve to improve skeletal properties in birds, especially when considering that skeletal disorders often affect the tibia and the proper function of the skeletal system plays an essential role in animal welfare and poultry production.

Publication: Bone 39, 100–105, 2006, tab. 3. In English, summary in English.

Marcin R. Tatara, Malin Plumhoff Tygesen, Barbara Sawa-Wojtanowicz,
Adrian Paul Harrison

THE IMPACT OF BONE DEVELOPMENT ON FINAL CARCASS WEIGHT

Proper development and function of the skeleton is crucial for the optimal growth of an organism, with rapid growth rates often resulting in skeletal disorders in farm animals. Yet, despite clear benefits for breed selection and animal welfare, the impact of bone development on final livestock characteristics remains largely undetermined. Male Shropshire lambs, sired by a ram with a high genetic potential for daily live weight gain (n = 11), or a ram with a high genetic potential for both daily gain and lean content (n = 12), were slaughtered at a mean age of 146 days. The femur was removed and its parameters correlated with carcass weight. Results suggest that both femur length and femur weight act as good predictors of final carcass weight in lambs. However, no effect of paternal genetics, on the femur to carcass correlations, was noted.

Publication: Arch. Tierzucht 132–136, 2006, fig. 1. In English, summary in English and German.

Jose Valverde Piedra, Małgorzata Kapica,
Sylwia E. Szymańczyk-Kwapik, Marta Pawłowska, Iwona Puzio

THE EFFECT OF ORAL LECTIN ADMINISTRATION ON THE STRUCTURE OF THE GASTROINTESTINAL MUCOSA OF NEWBORN RATS

Wpływ doustnego podawania lektyny na strukturę błony śluzowej przewodu pokarmowego u nowo narodzonych szczurów

The aim of the study was to evaluate single administration of Suilektin® – a lectin preparation on small intestine structure during the postnatal development

period. Studies comprised 12 Wistar rats. On the 11th day of life a single dose of $100 \text{ mg} \cdot \text{kg b.wt}^{-1}$ was administered by gastric tube to experimental rats, while control rats received saline. For histological analyses samples were taken on 28 day of life, fixed and processed according to standard histological procedures. Rats that were treated with the lectin preparation gained higher body weight and had longer small intestine. In eosin-hematoxylin stained slices the structure of the small intestine was analyzed. The intestinal mucosa and muscle layer were thicker as well as the villi were shorter and crypt were deeper in lectin preparation treated rats compared to controls. These changes indicate the efficacy of the lectin preparation Suilektin® and the possibility of its application for suckling animals in order to minimize the negative effects of the weaning process.

Publication: Folia Univ. Agric. Stetin. Zootechnica 250, 81–86, 2006. In Polish, summary in English.

Jose Z. Valverde Piedra, Jarosław Woliński, Tomasz Skrzypek,
Daniel Laubitz, Marta Pawłowska, Sylwia E. Szymańczyk,
Paweł Michałowski, Romuald Zabielski

SUILEKTIN® – NEW PRODUCT FOR WEANING PIGLETS' PROPHYLAXIS.

Suilektin® – nowy preparat w profilaktyce odsadzania prosiąt

The process of weaning is complex and encompasses not only changes related to the type food ingested, but also environmental and psychological changes influencing the functioning of the digestive tract. During weaning there is a decreased feed intake and an ensuing lack of body weight gain or even a decrease in body weight. Histological and biochemical changes in the structure and functioning of the small intestine decrease the digestion and absorption capacity of the gastrointestinal tract leading to serious economical losses. The aim of the study was to determine the efficacy of the original compound (Suilektin®), obtained from kidney beans to prevent digestive dysfunctions of the gastrointestinal tract and piglet's body weight decrease during the weaning period. Experiments were carried out in 4 pig farms on 298 piglets of both sexes from days 10-63 of postnatal life. In each farm the piglets were divided into control and experimental groups. Piglets from the experimental group received a single oral dose of aqueous suspension of Suilektin® compound between day 10 and 14 of life. The piglets were weaned at the age of 28 days and fed a complete mixture during the appropriate growing period. In 2 farms mixtures not containing growth promoters were fed to the pigs, and in the remaining 2 farms a commer-

cial mixture containing antibiotic growth promoters was given to the animals. The results indicate the positive effect of Suilektin® compound when it is administered orally between day 10 and 14 of life. At the end of the observation period the piglets from the group receiving the lectin compound demonstrated a significantly higher body weight and daily body weight gain in comparison to the piglets from the control group. Feed conversion ratios also indicated better feed utilization in the group of piglets receiving the Suilektin® compound compared to the control groups. The results of the study indicate that a single dose of Suilektin® compound administered between day 10 and 14 of life facilitates an increased daily body weight gain during the weaning period in both large and small pig farms independently of whether or not antibiotic growth promoters are included in the feed.

Publication: Medycyna Wet. (Lublin), 62, 1412–1414, 2006. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

BIEŃKO M., RADZKI R.P., JAROSZ Ł.: Bone structure in male Wistar rats determined by dual energy x-ray absorptiometry and peripheral quantitative computed tomography after chromium exposure.

Ref. XXIII Congress of the Polish Physiological Society „Physiology without limits” Warszawa, 14–16 IX 2006

Publication: J. Physiol. Pharmacol. 57, 122, 2006. In English.

KAPICA M., VALVERDE PIEDRA J.L., PUZIO I., GAJEWSKI Z., WILCZAK J., LAUBITZ D., ZABIELSKI R.: Effect of some bioactive dietary ingredients on neonatal piglet development. (Wpływ wybranych bioaktywnych składników diety na rozwój nowo narodzonych prosiąt).

Ref. XXXV Scientific Conference: „Nutritional methods of stimulation of animal production and health”, Olsztyn-Mierki, 27–28 VI 2006.

Publication: Proceedings of the XXXV Scientific Conference: „Nutritional methods of stimulation of animal production and health”, 2006, In Polish.

KAPICA M., PUZIO I., ZABIELSKA M., ZABIELSKI R.: Apelin may control the secretion of pancreatic juice in anaesthetized rats.

Ref. XXIII Congress of the Polish Physiological Society „Physiology without limits” 14–16 IX 2006. Warsaw, Poland.

Publication: J. Physiol. Pharmacol. 57, suppl. 2, 159, 2006. In English.

KRUPSKI W., TATARA M. R., MAJCHER P.: Diagnostics of intervertebral discs degeneration and intervertebral foramens narrowing of the cervical spine using computed tomography with 3 D SSD reconstructions.

- Ref. The XXIVth International Congress of Radiology. South Africa, Cape Town, 12–16 IX 2006.
Publication: Proceedings of The XXIV International Congress of Radiology, 512, 2006. In English.
- KRUPSKI W., TATARA M. R., MAJCHER P.: Diagnostics of intervertebral discs degeneration and intervertebral foramens narrowing of the lumbar-sacral spine using computed tomography with 3 D SSD reconstructions.
 Ref. The XXIV International Congress of Radiology, South Africa, Cape Town, 12–16 IX 2006.
Publication: Proceedings of The XXIV International Congress of Radiology, 508, 2006. In English.
- KRUPSKI W., TATARA M. R., MAJCHER P.: 3 D computed tomography evaluation of osteophytes located on margins of fissure of spondylolysis.
 Ref. The XXIVth International Congress of Radiology. South Africa, Cape Town, 12–16 IX 2006.
Publication: Proceedings of The XXIVth International Congress of Radiology, 72, 2006. In English.
- PAWŁOWSKA M., VALVERDE J.L., KAPICA M., SZYMAŃCZYK S.E., SZCZEPANIAK K., SKRZYPEK H., GAWRON A., PIERZYNOWSKI S.G., FILIP R. STUZIŃSKI T.: Effects of L-alanyl-L-glutamine (Ala-Gln) dipeptide administration on intestinal mucosa and bones development during the postnatal life of pigs. (Wpływ dwupeptydu L-alanylo-L-glutaminy (Ala-Gln) na rozwój śluzówki jelit i kości podczas życia postnatalnego prosiąt).
 Ref. X International Symposium on Digestive Physiology in Pigs. 25–27 V 2006 Veile, Denmark.
Publication: Book of abstracts X International Symposium on Digestive Physiology in Pigs 16, 2006. In English.
- PAWŁOWSKA M., VALVERDE PIEDRA J.L., SZYMAŃCZYK S.E., PUZIO I., BIEŃKO M., SKRZYPEK T., STUZIŃSKI T.: The influence L-alanyl-L-glutamine (Ala-Gln) on small intestinal mucosa structure and bone features during the first 14 days of postnatal life of pigs. (Wpływ L-alanylo-L-glutaminy (Ala-Gln) na strukturę śluzówki jelita cienkiego i kości podczas pierwszych 14 dni życia postnatalnego prosiąt).
 Ref. XXXV Scientific Conference: „Nutritional methods and animal production and stimulation”, Olsztyn-Mierki, 27–28 VI 2006.
Publication: of XXXV Scientific Conference: „Nutritional methods and animal production and stimulation”, 2006. In English.
- PIERZYNOWSKI S.G., SILEIKIENE V., VALVERDE PIEDRA J.L., SZYMAŃCZYK S., GREGORY P.C., KRUSZEWSKA D., MOSENTHIN R., ZABIELSKI R., WESTRÖM B.: Ileal exposure to pancreatic enzymes and bile inhibit exocrine pancreatic secretion („ileal brake”) in pigs.
 Ref. X International Symposium on Digestive Physiology in Pigs, Vejle, Denmark 25–27 V, 2006.

Publication: Book of abstracts X International Symposium on Digestive Physiology in Pigs, 84, 2006.

PUZIO I., KAPICA M., LIPÍŃSKI P., VALVERDE PIEDRA J.L., STARZYŃSKI R.R., BIEŃKO M., ZABIELSKI R.: The effect of iron supplementation on bone development in neonatal piglets (Wpływ suplementacji żelaza na rozwój kości u nowo narodzonych prosiąt).
Ref. XXXV Scientific Conference: „Nutritional methods of stimulation of animal production and health”, Olsztyn-Mierki, 27–28 VI 2006

Publication: Proceedings of the XXXV Scientific Conference: „Nutritional methods of stimulation of animal production and health”, 2006. In Polish.

PUZIO I., KAPICA M., BIEŃKO M., VALVERDE PIEDRA J.L., GAJEWSKI Z., KULASEK G., ZABIELSKI R. Dietary bioactive substances influenced perinatal bone development in piglets.
Ref. X International Symposium on Digestive Physiology in Pigs. Denmark 25–27 V 2006.

Publications: Books of abstracts, X International Symposium on Digestive Physiology in Pigs, 53. 2006. In English.

RADZKI R.P., BIEŃKO M., FILIP R.S.: Strontium ranelate improves quality of bone tissue in orchidectomized rats.
Ref. XXIII Congress of the Polish Physiological Society „Physiology without limits” 14–16 IX 2006.

Publication: J. Physiol. Pharm. 52 (suppl. 2), 217, 2006. In English.

SKRZYPEK T., VALVERDE PIEDRA J.L., SKRZYPEK H., KAZIMIERCZAK W., SZYMAŃCZYK S.E., PAWŁOWSKA M., ZABIELSKI R.: Intestinal villi structure during the development of pig and wild boar crossbreed neonates.
Ref. X International Symposium on Digestive Physiology in Pigs, Vejle, Denmark, 25–27 V, 2006.

Publication: Book of abstracts, X International Symposium on Digestive Physiology in Pigs, 52, 2006. In English.

SKRZYPEK T., VALVERDE PIEDRA J.L., SKRZYPEK H., SZYMAŃCZYK S.E., ZABIELSKI R.: Comparison of the small intestine mucosa structure in natural and milk formula fed piglets and wild boar crossbreed neonates at 7 days of life using electron scanning microscope (SEM) (Porównanie struktury błony śluzowej jelita cienkiego prosiąt karmionych naturalnie i preparatem mlekozastępczym oraz świniodziaków w 7 dniu życia przy użyciu skaningowego mikroskopu elektronowego (SEM)).
Ref. IV National Conference of Gastrointestinal Tract Young Physiologists, Warsaw, 8–9 V 2006.

Publication: Proceedings of the IV National Conference of Gastrointestinal Tract Young Physiologists, 5–6, 2006. In Polish.

SKRZYPEK T., VALVERDE PIEDRA J.L., SKRZYPEK H., SZYMAŃCZYK S.E., ZABIELSKI R.: Development of the small intestine mucosa in the pig during 35 days of the postnatal life.

- Ref. XXIII Congress of the Physiological Society „Physiology without limits” Warsaw, Poland 14–16 IX, 2006.
Publication: Proceedings of the XXIII Congress of the Physiological Society „Physiology without limits” 27, 2006. In English.
- SZYMAŃCZYK S.E., VALVERDE PIEDRA J.L., PAWŁOWSKA M., DĄBEK M., PIERZYNOWSKI S.G.:
 The influence of phospho-gluco-peptides on broiler chickens performance.
 Ref. XXXV Scientific conference: „Nutritional methods of stimulation of animal production and health”. Olsztyn –Mierki, 27–28 VI 2006.
Publication: Proceedings of the XXXV Scientific conference: „Nutritional methods of stimulation of animal production and health” 2006. In Polish.
- SZYMAŃCZYK S.E., VALVERDE PIEDRA J.L., SKRZYPEK T., GODLEWSKI M., SKRZYPEK H., BIERNAT M., ZABIELSKI R., PIERZYNOWSKI S.G.: The influence of phospho-gluco-peptides on the structure and function of digestive tract in broiler chickens.
 Ref. XXXV Scientific conference: „Nutritional methods of stimulation of animal production and health”. Olsztyn-Mierki, 27–28 VI 2006.
Publication: Proceedings of the XXXV Scientific conference: „Nutritional methods of stimulation of animal production and health” 2006. In Polish.
- ŚLIWA E., TATARA M. R., PIERSIAK T., DOBROWOLSKI P., STUDZIŃSKI T.: Postnatal catch-up in piglets bone development after prenatal dexamethasone treatment.
 Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 68, 2006. In English.
- ŚLIWA E., TATARA M. R., STUDZIŃSKI T.: Dexamethasone (Dex) and alpha-ketoglutarate (AKG) influence the bone development during both maternal and neonatal administration in pigs.
 Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 68–69, 2006. In English.
- ŚLIWA E., TATARA M. R., KRUPSKI W., STUDZIŃSKI T.: Post-gastrectomy osteopenia of femur in pigs.
 Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 70, 2006. In English.
- TATARA M. R., ŚLIWA E., KRUPSKI W., STUDZIŃSKI T.: Prenatal administration of 3-hydroxy-3-methylbutyrate to pigs increases peak bone mass in offspring.
 Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 69, 2006. In English.

- TATARA M. R., ŚLIWA E., KRUPSKI W., STUDZIŃSKI T.: Alpha-ketoglutarate (AKG) administration to pregnant sows increases mineralization, geometrical and mechanical endurance of skeleton in their offspring.
Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 69, 2006. In English.
- TATARA M. R., ŚLIWA E., KRUPSKI W., STUDZIŃSKI T.: Fundectomy induces osteopenia in axial skeleton in pigs.
Ref. XXXIII European Symposium on Calcified Tissues. Prague, Czech Republic, 10–14 V 2006.
Publication: Calcified Tissue International, 78, Suppl. 1, 69–70, 2006. In English.
- TATARA M. R., ŚLIWA E., KRUPSKI W.: 3-hydroxy-3-methylbutyrate increases mineralization, geometrical properties and mechanical endurance of ulna under conditions of experimental osteopenia induction. (3-hydroksy-3-metylomaślan zwiększa mineralizację, parametry geometryczne i wytrzymałość mechaniczną kości łokciowej indyka w warunkach doświadczalnej indukcji osteopenii).
Ref. Scientific Conference of Bone and Joint Metabolic Diseases Section. Jurata-Hel, Poland, 1–3 IX 2006.
Publication: Proceedings of Scientific Conference of Bone and Joint Metabolic Diseases Section, 8, 2006. In Polish.
- VALVERDE PIEDRA J.L., PIERZYŃOWSKI S.G.: Diversion of bile and pancreatic juice influence the feedback regulation of pancreatic juice secretion in the pig.
Ref. X International Symposium on Digestive Physiology in Pigs, Vejle, Denmark, 25–27 V 2006.
Publication: Book of abstracts, X International Symposium on Digestive Physiology in Pigs, 55, 2006. In English.
- VALVERDE PIEDRA J.L., SZYMAŃCZYK S.E., KAPICA M., PUZIO I., PAWŁOWSKA M., PIERZYŃOWSKI S.G. The effect of bile acids on exocrine pancreatic secretion in the pig.
Ref. XXIII Congress of the Physiological Society „Physiology without limits” Warsaw. Poland 14–16 IX 2006.
Publication: Proceedings of the XXIII Congress of the Physiological Society „Physiology without limits” 37, 2006. In English.
- ZABIELSKA M., KAPICA M., PUZIO I. Role of apeline in regulation of pancreatic juice secretion in rat. (Rola apeliny w regulacji wydzielania soku trzustkowego u szczurów).
Ref. IV Conference of Young Scientists on Digestive System. Warsaw 8–9 V 2006.
Publication: Proceedings of IV Conference of Young Scientists on Digestive System. Warsaw, 2006. In Polish.
- ZABIELSKI R., GAJEWSKI Z., VALVERDE PIEDRA J.L., WOLIŃSKI J., LAUBITZ D., WILCZAK J., KULASEK G.: The perinatal development of the gastrointestinal tract in piglets can be modified by supplementation of sow diet with bioactive substances.

Ref. X International Symposium on Digestive Physiology in Pigs, Vejle, Denmark
25–27 V, 2006

Publication: Book of abstracts, X International Symposium on Digestive Physiology in Pigs, 52, 2006. In English

OTHER PUBLICATIONS

STUDZIŃSKI T., MATRAS J., GRELA E.R., VALVERDE PIEDRA J. L., TRUCHLIŃSKI J., TATARA M. R.: Minerals – functions, requirements, excessive intake and toxicity. [In:] Mo-senthin R., Zentek J., Zebrowska T. (Eds), *Biology of Nutrition in Growing Animals. Publication: Elsevier, New York, 467–509, 2006, In English.*

STUDZIŃSKI T., GRELA E.R., TATARA M.R., KLEBANIUK R.: Physiological conditioning of cows' nutrition. (Fizjologiczne uwarunkowania żywienia krów). [In:] Mikołajczak J. (Ed), *Cattle Nutrition. (Żywienie bydła). Publication: Wydawnictwa Uczelniane Akademii Techniczno-Rolniczej w Bydgoszczy, Bydgoszcz, 88–108, 2006. In Polish.*

TATARA M.R.: Current methods for *in vivo* assessment of the skeletal system in poultry. (Metody przyżyciowej oceny układu kostnego u drobiu).
Publication: Medycyna Wet. (Lublin) 62, 266–269, 2006. In Polish, summary in English.

ŚLIWA E., STUDZIŃSKI T., TATARA M. R. Glucocorticoids and the metabolism and skeletal system growth. (Glikokortykosteroidy a metabolizm i wzrost kości).
Publication: Medycyna Wet. (Lublin) 62, 377–379, 2006. In Polish, summary in English.

SUB-DEPARTMENT OF BIOCHEMISTRY

58 Lubartowska, Lublin

Head: Prof. Dr habil. Marta Kankofer

RESEARCH STUDIES (SUMMARIES)

Marta Kankofer, Justyna Lipko

THE RELATIONSHIP BETWEEN LIPID PEROXIDATION INTENSITY AND TOTAL ANTIOXIDANT CAPACITY IN CASES OF SPONTANEOUSLY RELEASED AND RETAINED BOVINE PLACENTA

The retention of foetal membranes (RFM) is supposed to be related to oxidative stress which can be evaluated through indirect and direct parameters, among others, total antioxidant capacity (TAC) and lipid peroxidation intensity (LPI).

Placental samples (maternal and foetal parts) were collected from Holstein-Friesian healthy cows immediately after spontaneous delivery (n = 10, group C) or caesarean section (n = 13, group A) at time or from RFM affected cows after spontaneous delivery (n = 8, group D) or caesarean section (n = 15, group B), and TAC and LPI were measured spectrophotometrically in corresponding supernatants obtained from placental samples. The TAC values were lowered in the healthy cows (without RFM) surgically delivered (group A) compared to the group C (spontaneous delivery) ($p < 0.05$) while the LPI was similar whatever the mode of delivery. The TAC and LPI values were markedly increased in both maternal and foetal placenta of RFM affected cows (groups B and D) compared to the respective controls (groups A and C) ($p < 0.05$). The LPI was more intense in the foetal part than in the maternal placenta ($p < 0.05$) whatever the mode of delivery or the occurrence of RFM whereas the TAC was higher in the maternal part except in cases of spontaneous delivery with RFM (group D).

The results confirm the occurrence of oxidative stress during RFM particularly in the foetal part but the relationship between oxidative/antioxidative processes in bovine placenta still needs clarification.

Publication: Rev. Med. Vet. 157, 405–409, 2006, fig. 3. In English, summary in English.

Marta Kankofer, Justyna Lipko, Edyta Albera, Renata Urban-Chmiel

**THE RELATIONSHIP BETWEEN MODE OF DELIVERY
AND OXIDATIVE/ANTIOXIDATIVE STATUS OF PLACENTA IN COWS**

The aim of study was to compare oxidative/antioxidative status in bovine placenta and to relate it to mode of delivery. Oxidative/antioxidative status was measured by total antioxidant capacity (TAC) and lipid peroxidation intensity. Healthy cows were divided into groups: A – caesarian section and B – spontaneous delivery. TAC and lipid peroxidation intensity were determined in homogenates of maternal and fetal part of placenta by use of spectrophotometric methods at 593 and 505 nm. TAC values were lower in group A than in B as well as in fetal as in maternal part of bovine placenta. Lipid peroxidation intensity was higher in fetal than in maternal part of placenta, values in both groups were similar. The results may indicate that mode of delivery influences oxidative/antioxidative status of bovine placenta.

Publication: Slovenian Vet. Res. 43 (suppl 10), 33–35, 2006, fig. 2. In English, summary in English and German.

Witold Kędzierski, Cezary H. Krawczyk

**THE LEVELS OF TRIACYLGLYCEROLS AND CHOLESTEROL IN BLOOD PLASMA
OF MARES IN THE PERIOVULATORY PERIOD**

Metabolism of lipids and their level in blood of animal and man is dependent on many factors, including the stages of estrus cycle. The aim of this study was to establish the level of triacylglycerols (TG) and cholesterol in blood plasma during the periovulatory period in mares. 12 Arabian mares were included in the investigation during the breeding season. The number of days of estrus cycle was defined on the basis of results of transrectal ultrasonography conducted once a day. The animals were divided into two groups: 8 mares with recorded ovulation and 4 with anovulatory cycle. Blood samples were collected from jugular vein at rest in the morning, and plasma TG and cholesterol levels were determined by enzymatic methods. In blood plasma of ovulating mares, the levels of TG and cholesterol decreased after ovulation. In group of anovulatory mares the values of measured parameters were not statistically different.

Publication: Annales UMCS (Lublin) sectio DD 61, 151–155, 2006, fig. 2. In English, summary in English.

Witold Kędzierski, Domenico Bergero

**COMPARISON OF THE METABOLIC RESPONSES OF THOROUGHBRED
AND ARABIAN HORSES DURING THE SAME-INTENSITY EXERCISE**

The objective of the present work was to compare the changes of blood parameters induced by the same work and performed in the same conditions in two racehorse breeds Thoroughbred and Arabian. The effect of moderate intensity exercise was studied in 20 stallions – ten Thoroughbreds, aged 2–3 years and 10 Arabians, 3–4 years old. All the horses were administered the same effort test consisting in 1200 m gallop at a speed typical of the daily training sessions, causing a rise of a blood LA level up to about 4 mmol/l. Three jugular venous blood samples were collected for each horse: at rest, just after the end of the gallop and 30 minutes later. In the gathered blood, a lactic acid (LA) and hemoglobin (Hb) concentration was determined as well as plasma level of glucose (Glc), triacylglycerols (TG), glycerol, free fatty acids (FFA), total plasma proteins (TP) and the activity of creatine kinase (CK), lactate dehydrogenase (LDH) and aspartate aminotransferase (AST). In the Arabian horses, an increase of CK activity measured just after exercise was higher than in Thoroughbreds as against the levels of TP, glycerol and FFA. Similarly, after 30 minutes` rest a post-exercise rise of TP, AST, glycerol and FFA proved higher in the Arabians compared to the Thoroughbred horses. Only a TG plasma concentration measured 30 minutes following the effort was significantly lower in the Arabian horses as in Thoroughbreds. It means that the Arabian horses adapted worse to effort test realized in this study as compared to the Thoroughbreds. The parameters related to lipid metabolism proved to be the most sensitive indicators of breed differences in relation to mild-intensity exercise.

Publication: Pol. J. Vet. Sci. 9, 233–238, 2006, tab. 2. In English, summary in English.

Roland Pagl, Joerg Aurich, Frank Müller-Schlösser,
Marta Kankofer, Christine Aurich

**COMPARISON OF AN EXTENDER CONTAINING DEFINED MILK PROTEIN
FRACTION WITH A SKIM MILK BASED EXTENDER FOR STORAGE
OF EQUINE SEMEN AT 5°C**

A problem of semen extenders based on milk or egg yolk is the fact that these biological products consist of a variety of substances. Extenders containing only components with clearly protective effects on spermatozoa would thus be

an advantage. In this study, we have compared the effects of an extender containing defined caseinates and whey proteins only (EquiPro, defined milk protein extender) with skim milk extender on equine spermatozoa during cooled storage. The defined milk protein extender was used with and without the antioxidant N-acetyl cysteine (NAC). In the second experiment, semen was diluted with PBS or defined milk protein extender and was either stored directly or 90% of seminal plasma was removed by centrifugation and replaced by defined milk protein extender before storage. In both experiments, eight stallions were available for semen collections. Motility, velocity and membrane integrity of spermatozoa were determined by CASA immediately after semen processing and after 24, 48 and 72 h of storage at 5°C. Total motility after 24 h of storage was lowest in semen diluted with PBS ($p < 0.05$ versus all extenders). At 48 and 72 h, motility of spermatozoa in defined milk protein extender was significantly ($p < 0.05$) higher than in PBS or skim milk extender. Velocity of spermatozoa after storage was highest in defined milk protein extender. Membrane integrity after storage was significantly ($p < 0.05$) lower in semen diluted with PBS than in semen diluted with both extenders. Addition of NAC was without effect on the examined parameters. Centrifugation further increased the percentage of motile and membrane-intact spermatozoa in the defined milk protein extender ($p < 0.05$). Velocity of spermatozoa in this extender was not negatively affected by centrifugation.

Publication: Theriogenology 66, 1115–1122, 2006, fig. 4, tab. 2. In English, summary in English

Roland Pagl, Christine Aurich, Marta Kankofer

ANTIOXIDATIVE STATUS AND SEMEN QUALITY DURING COOLED STORAGE IN STALLIONS

Activity of the antioxidative enzymes glutathione peroxidase (GSH-Px), superoxide dismutase (SOD) and catalase (CAT), content of thiobarbituric acid reactive substances (TBARS) and SH-groups were determined in native stallion semen ($n = 8$ stallions). Semen was then diluted in Kenney extender, EquiPro extender either with or without addition of N-acetyl cysteine or phosphate-buffered saline (PBS) and stored for 72 hours at 5°C. Correlations between initial activity of enzymes and development of semen motility and membrane integrity were calculated. Activities of GSH-Px, SOD and CAT immediately after semen collections were 10.0 ± 0.6 picokatals, 0.40 ± 0.03 SOD units and 0.70 ± 0.05 nanokatals/ 10^6 spermatozoa, respectively. TBARS content was 0.06 ± 0.01 nmol and SH-group content 1.7 ± 0.5 mmol/ 10^6 spermatozoa. The loss of motile spermatozoa during storage did not differ between extenders. N-acetyl cysteine had no effect on semen

motility and membrane integrity. The loss in membrane-intact spermatozoa was highest ($p < 0.05$) in semen diluted in PBS. Motility and membrane integrity after addition of extender were positively correlated with GSH-Px and CAT, indicating that antioxidative mechanisms contribute to the initial high percentage of motile and membrane-intact spermatozoa. However in these samples the decrease in semen quality was most pronounced. No correlations existed between initial activity of anti-oxidative enzymes, peroxidation products and semen quality during storage. This indicates that once extender has been added, peroxidative damage to sperm membranes is not the predominant cause of losses in semen quality.

Publication: J. Vet. Med. A 53, 486–489, 2006, fig. 2. In English, summary in English.

Maria Podolak, Witold Kędzierski, Domenico Bergero

**COMPARISON OF THE BLOOD PLASMA CATECHOLAMINES LEVEL
IN THOROUGHBRED AND ARABIAN HORSES
DURING THE SAME-INTENSITY EXERCISE**

The aim of this study was to compare changes in epinephrine (E), norepinephrine (NE) and dopamine (DA) levels in blood plasma of two racehorse breeds: Arabian and Thoroughbred during moderate intensity exercise performed in the same conditions.

The increase in plasma E level just after exercise was higher in Thoroughbreds than in Arabian horses. During the whole test, Arabians showed the higher levels of NE and DA as compared to those found in Thoroughbreds.

Publication: Pol. J. Vet. Sci. 9, 71–73, 2006, tab. 1. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

KANKOFER M., LIPKO J., ALBERA E., URBAN-CHMIEL R.: The relationship between mode of delivery and oxidative/antioxidative status of placenta in cows.

Ref. VII Middle European Buiatric Congress, Radenci, 29 III – 1 IV 2006.

Publication: Slovenian Vet. Res. 33–35, 43, suppl. 10, 2006. In English.

ALBERA E., LISOWSKI A., KANKOFER M.: The relationship of oxidative/antioxidative status between colostrum, mature milk and blood plasma of cows.

Ref. X Annual Conference of the European Society for Domestic Animal Reproduction, Portoroz, 7–9 IX 2006.

Publication: Repr. Domest. Anim. 172, 352, 41, 2006. In English.

PAGL R., AURICH JE., MÜLLER-SCHLÖSSER F., KANKOFER M., AURICH C. Comparison of an extender containing defined milk proteins with a skim milk extender for cooled storage of equine semen.
Ref. X Annual Conference of the European Society for Domestic Animal Reproduction, Portoroz, 7–9 IX 2006.

Publication: Repr. Domest. Anim. 36, 319, 41, 2006. In English.

ŁOPUCKI M., ROGOWSKA W., PIETRUSZEWSKI S., KANKOFER M., STACHOWICZ N., DANIŁOŚ J., KOTARSKI J.: Estimation of influence of variable magnetic field 50 Hz on oxygen content in human cotyledon *in vitro*. (Badania nad wpływem zmiennego pola magnetycznego o częstotliwości 50 Hz na przemiany tlenu w perfundowanym *in vitro* zraziku łożyska ludzkiego).

Ref. XXIX Congress of Polish Gynaecological Society, Poznań, 28–30 IX 2006.

Publication: Ginekologia Polska 77, suppl. 1, 34, 2006. In Polish.

ŁOPUCKI M., ROGOWSKA W., PIETRUSZEWSKI S., KANKOFER M., STACHOWICZ N., DANIŁOŚ J., KOTARSKI J.: Estimation of influence of variable magnetic field 50 Hz on HCG and HPL generation in perfusion fluid in human cotyledon *in vitro*. (Badania nad oddziaływaniem zmiennego pola magnetycznego o częstotliwości 50 Hz na wytwarzanie HCG i HPL w perfundowanym *in vitro* zraziku łożyska ludzkiego).

Ref. XXIX Congress of Polish Gynaecological Society, Poznań, 28–30 IX 2006.

Publication: Ginekologia Polska 77, suppl. 1, 37, 2006. In Polish.

OTHER PUBLICATIONS

ŁOPUCKI M., ROGOWSKA W., PIETRUSZEWSKI S., KANKOFER M., DANIŁOŚ J., STACHOWICZ N.:
The estimation of the influence of variable magnetic fields 50 Hz on oxygen content in fetal and maternal perfusion fluid in human cotyledon *in vitro*. (Badania nad oddziaływaniem zmiennego pola magnetycznego o częstotliwości 50 Hz na zawartość tlenu w płynie perfuzyjnym krążenia płodowego i matczynego w zraziku łożyska ludzkiego w warunkach *in vitro*).

Publication: III International Scientific Conference on Influence of Elektromagnetic Field on Agricultural Environment – Agrolaser 2006 ed. by The Institute of Agrophysics PAN in Lublin, 57–69, 2006. In Polish, summary in Polish and English.

ŁOPUCKI M., ROGOWSKA W., PIETRUSZEWSKI S., KANKOFER M., DANIŁOŚ J., STACHOWICZ N.:
The estimation of the influence of variable magnetic fields 50 Hz on oxygen utilisation in the human cotyledon *in vitro*. (Badania nad oddziaływaniem zmiennego pola magnetycznego o częstotliwości 5 Hz na zużycie tlenu w zraziku łożyska ludzkiego w warunkach *in vitro*).

Publication: III International Scientific Conference on Influence of Elektromagnetic Field on Agricultural Environment – Agrolaser 2006 ed. by The Institute of Agrophysics PAN in Lublin, pp. 57–69, In Polish, summary in Polish and English.

DEPARTMENT AND CLINIC OF ANIMAL INTERNAL DISEASES

30 Głęboka, Lublin

Head: Prof. ordin. Dr habil. Eligiusz Madej
Prof. ordin. Dr. habil. Zbigniew Pomorski
Prof. ordin. Dr. habil. Józef Filar
Prof. extraordin. Dr. habil. Adam Stec

RESEARCH STUDIES (SUMMARIES)

Marcin Gołyński, Marcin Szczepanik, Dorota Pomorska, Piotr Wilkołek

CUTANEOUS NOCARDIOSIS IN A DOG – CLINICAL CASE PRESENTATION

A case of cutaneous nocardiosis in a dog has been described. Clinical diagnosis was made on the basis of cytological and histopathological examinations and bacteriological analysis. The dog was treated with cephalexin and successfully cured in 8 weeks. There have been no reports of such cases in Poland so far.

Publication: Bull. Vet. Inst. Pulawy, 50,47–50. 2006. In English, summary in English.

Jacek Madany, Hubert Nowakowski, Andrzej Pępiak, Sławomir Paško

UVEITIS ANTERIOR IN A CAMEL – THE CLINICAL CASE

Characteristics, diagnostics, clinical signs and therapy course of uveitis in circus camel were described. Moderate *uveitis anterior* of traumatic origin in the camel is a real proof of possible uveitis occurrence in species other than cats, dogs, and horses in which the disease was observed most often.

Publication: Bull. Vet. Inst. Pulawy, 50, 131–135, 2006. In English, summary in English.

Aleksandra Sebastian, Anne Mette Madsen, Lennart Mårtensson,
Dorota Pomorska, Lennart Larsson

**ASSESSMENT OF MICROBIAL EXPOSURE RISKS FROM HANDLING
OF BIOFUEL WOOD CHIPS AND STRAW – EFFECT OF OUTDOOR STORAGE**

Handling of biofuels may release dust particles containing high concentrations of hazardous microorganisms, thus representing a potential occupational health problem. We analysed the microbial dustiness of baled straw (cultivated both conventionally and ecologically) and of wood chips from piles that had been stored outdoors for up to 11 months by using total spore counting, cultivation, and measuring of endotoxin and chemical markers of fungal biomass, lipopolysaccharide, and peptidoglycan. The bacterial dustiness of straw was much greater than of wood chips, whereas the fungal dustiness did not differ much. In general, samples from the inner part of each biofuel material were dustier than samples from the surface, except for fungal and bacterial biomass in wood chips and total fungi and fungal biomass in ecological straw. A considerable increase of bacterial dustiness occurred during storage over summer. Dust from ecological straw contained considerably less bacterial components than from conventional straw and, in addition, exhibited a less pronounced increase upon storage over summer. Summing up, biofuels represent sustainable energy resources of growing economic importance but may at the same time pose significant health problems. We found that storage of biofuels outdoors over summer increased the microbiological dustiness and should therefore be avoided and that ecological straw included less microbe-containing dust than conventional straw. That is why, it should be preferred as it reduces the exposure to harmful microbiological agents.

Publication: Annales Agric. Environ. Med. 13, 139–145, 2006, In English, summary in English.

Adam Stec, Łukasz Kurek, Jacek Mochol

**SELECTED ELEMENTS OF METABOLIC PROFILE AND CONDITION STATE
OF DAIRY CATTLE ON FARMS OF DIFFERENT MANAGEMENT SYSTEMS
AND METHODS OF FODDER APPLICATION**

The effect of three most frequent systems of management and methods of fodder application on development of disorders in the mineral and energetic metabolism as well as dysfunction of parenchymatous organs in the herds of

dairy cattle in central Lublin region was investigated. The studies were conducted on 180 clinically healthy cows, the Lowland Black-and-White and HF breeds, as well as their crossbreds, of the highest milk yield in autumn and winter seasons of 2003–2005. Numerous elements indicating the existence of strict correspondence between the studied parameters and the systems of management and methods of feed application were found. The most advantageous, both with respect to the condition and metabolic parameters of blood were the farms with the system of tethered maintenance and mechanized method of feed application.

Publication: Bull. Vet. Inst. Pulawy, 50, 199–203, 2006. In English, summary in English.

Marcin Szczepanik, Marcin Gołyński, Dorota Pomorska,
Piotr Wilkołek, Iwona Tazkun, Marcel Kovalik

DERMATOPHYLOSIS IN A HORSE – A CASE REPORT

A case of dermatophilosis in a horse was described. The disease was diagnosed in a three-year-old mare. Physical examination, cytology, bacterial culture, and histopathological examination were performed. Cytology revealed numerous filamentous chains of bacteria formed into 2 to 4 rows of cells. *D. congolensis* was grown in a culture. Histopathological examination revealed pyoderma accompanied by mixed cell infiltrate consisting primarily of neutrophils, and perifolliculitis as well as exocytosis of neutrophils and hyperkeratosis. Penicillin and streptomycin were administered and the lesions were washed out with a water solution composed of chlorhexidine. Complete recovery was observed after 6 weeks of treatment.

Publication: Bull. Vet. Inst. Pulawy, 50, 619–622, 2006. In English, summary in English.

Marcin Szczepanik, Marcin Gołyński, Piotr Wilkołek, Jarosław Popiel,
Anna Śmiech, Dorota Pomorska, Hubert Nowakowski

EHLERS-DANLOS SYNDROME (*Cutaneous asthenia*) A REPORT OF THREE CASES IN CATS

The paper presents three cases of Ehlers-Danlos syndrome, very rarely found in cats. The disease in this species is characterized by skin hyper-extensibility.

Physical examination and additional diagnostics, i.e. complete blood count, serum chemistry profile and histopathological examinations (including HE and van Gieson's staining), as well as electronmicroscopic examinations were performed. The diagnosis was based on physical examinations, and the results of additional testing. The values of extensibility index, which for the examined animals were 23.3, 17.25, and 21.2% respectively, were calculated. Histopathological examinations revealed a disorganized arrangement of collagen fibres. Electronmicroscopic examinations revealed a diverse diameter of cross section of the fibres. One cat was treated with vitamin C at a dose of 50 mg/animal/d, after which slight improvement was noted.

Publication: Bull. Vet. Inst. Pulawy, 50, 609–612, 2006. In English, summary in English.

Piotr Wilkołek

**STUDIES OF THE CONTACT SENSITIVITY PROPERTIES
OF THIOAMIDES DERIVATIVES IN GUINEA PIGS**

Badania nad kontaktowymi właściwościami uczulającymi pochodnych tioamidów
u świnek morskich

Thioamides, especially thiobenzanilides and related compounds, are characterized by a wide spectrum of biological activities (antimicrobial, anthelmintic, analgesic, anti-inflammatory) depending on the type of substitution. 2,4-dihydroxythiobenzanilides have been discovered to have interesting in vitro efficiency against dermatophytes, yeasts and moulds. The purpose of this study was to assess adverse reactions of thioamides after skin contact. The study was done on 29 guinea pigs. The guinea pig maximization test (acc. to Magnusson Kligman' test) was used to estimate the risk of the skin contact allergic reactions. Skin irritation of the examined substances in different concentrations was assessed after epidermal topical application. Cross-reactions between thioamides and tetramethylthiuram disulfide was also examined. The leukocyte inhibition migration test (in vitro test) was done to confirm results of the skin epidermal tests.

Thioamides derivatives have very weak irritant properties and using these compounds in therapeutic concentrations (0.5–3%) has no risk of irritant adverse reaction after coming into contact with skin. Cross-reactivity was noticed among 2,4-dihydroksytiobenzamid and tetramethylthiuram disulfide. 2,4-dihydroksytiobenzamid is characterized by a weak sensitizing capacity (only 20% of animals were sensitized in GPMT) and according to OECD guidelines it may not be

classified as a skin sensitizer (R43), but in special circumstances it may cause allergic contact dermatitis.

Publication: Medycyna Wet. (Lublin) 62, 696–700, 2006. In Polish, summary in English.

OTHER PUBLICATIONS

MADANY J.: Clinical approach to senile catarat in dogs. (Zaćma starcza psów w świetle badań klinicznych).

Publication: Medycyna Wet. (Lublin), 62, 1272–1275, 2006. In Polish.

MADANY J.: Corneal dystrophies and degeneration in dogs.

Publication: Annales UMCS (Lublin) sectio DD, 61, 45–54. In English, summary in English.

MADANY J.: Horner syndrome in dogs and cats. (Zespół Hornera u psów i kotów).

Publication: Magazyn Wet. 15, 16–18, 2006. In Polish.

MOCHOL J., STEC A., KUREK Ł.: Equine rhabdomyolysis syndrome. (Mięśniochwat porażenny).

Publication: Magazyn Wet. 15, 32–34, 2006. In Polish.

MOCHOL J., STEC A., KUREK Ł.: The influence of the preparation Humobentofet on the levels of selected macroelements and selected indicators of parenchyma organs in mares in late pregnancy and early lactation. (Wpływ preparatu Humobentofet na stan czynnościowy narządów mięsżowych oraz gospodarkę kłaczy w końcowym okresie ciąży I pierwszych miesiącach laktacji).

Publication: Monography – New trends in diagnostic and therapy of internal diseases in pets. Lublin, 21–28, 2006. In Polish.

NOWAKOWSKI H., MADANY J.: Small bowel acute diarrhea dietetic treatment in dogs and cats. Part I. (Postępowanie dietetyczne przy ostrej biegunce pochodzącej z jelita cienkiego u psów i kotów. Cz. I.

Publication: Magazyn Wet., 15, 28–31, 2006. In Polish.

NOWAKOWSKI H., MADANY J.: Small bowel acute diarrhea dietetic treatment in dogs and cats. Part II. (Postępowanie dietetyczne przy ostrej biegunce pochodzącej z jelita cienkiego u psów i kotów. Część II.

Publication: Magazyn Wet., 15, 38–40, 2006. In Polish.

STEC A., KUREK Ł., MOCHOL J.: Changes of the levels of selected macroelements in cows blood after administration of different phosphorus preparations in clinical and sub-clinical hypophosphatemia. (Dynamika zmian wybranych makroelementów we krwi krów po zastosowaniu preparatów fosforowych w stanach klinicznej i subklinicznej hipofosfatemii).

Publication: Monography – New trends in diagnostic and therapy of internal diseases in pets. Lublin, 29–34, 2006. In Polish.

SZCZEPANIK M., BLIMKE Z., ŚMIECH A., TASZKUN I., WILKOŁEK P., POMORSKA D., GOŁYŃSKI M., POPIEL J.: Selected genetic dermatosis in the dogs in own observations. Part II. (Wybrane dermatozy psów uwarunkowane genetycznie w świetle obserwacji własnych. Cz. II.)

Publication: Magazyn Wet. 15, 23–30, 2006. In Polish.

SZCZEPANIK M., GOŁYŃSKI M., WILKOŁEK P., ŚMIECH A.: Feline asthenia – case report. (Astenia skóry u kota – przypadek kliniczny).

Publication: Monography – New trends in diagnostics and therapy of internal diseases in pets. Lublin, 97–100, 2006. In Polish.

SZCZEPANIK M., POMORSKI Z.: Levels of zinc, cuprum and magnesium in enzootic trichophytosis cows plasma (Poziomy cynku, miedzi i magnezu w surowicy u bydła chorego na enzootyczna postać trichofitozy).

Publication: Monography – New trends in diagnostics and therapy of internal diseases in pets. Lublin, 91–96, 2006. In Polish.

SZCZEPANIK M., TASZKUN I., P. WILKOŁEK P.: Selected feline ectoparasitosis. Part II. (Wybrane ektoparazytozy kotów. Cz. II.)

Publication: Magazyn. Wet. 15, 32–41, 2006. In Polish.

SZCZEPANIK M., WILKOŁEK P.: Feline atopy. Diagnostics and treatment in own observations. (Atopia kotów. Rozpoznawanie i leczenie oraz obserwacje własne dotyczące cech klinicznych i alergenów odpowiedzialnych za rozwój uczulenia).

Publication: Weterynaria w Praktyce, 3, 6–11, 2006. In Polish.

SZCZEPANIK M., WILKOŁEK P., ŁOPUCKA D.: Pruritus in cats. (Świąd u kotów).

Publication: Weterynaria w Praktyce, 2, 64–70, 2006. In Polish.

TASZKUN I., JAROSZ Ł.: Pilot study of subpopulation CD4 and CD8 lymphocytes of atopic dogs in blood. (Badania pilotażowe nad udziałem subpopulacji CD4 i CD8 limfocytów krwi obwodowej w przebiegu atopii psów).

Publication: Monography – New trends in diagnostics and therapy of internal diseases in pets. Lublin, 71–76, 2006. In Polish.

TASZKUN I., WILKOŁEK P., SZCZEPANIK M., POMORSKA D.: Application of intradermal tests in diagnostics of allergy in the dogs. (Zastosowanie testów śródskórnych w diagnostyce alergologicznej u psów).

Publication: Weterynaria w Praktyce, 1, 12–17. 2006. In Polish.

WILKOŁEK P., SZCZEPANIK M., BLIMKE Z., NOWAK M., POMORSKA D.: Identification of bacteria in dog pyodermites and assessment of susceptibility to mostly used antibiotics in veterinary dermatology. (Identyfikacja bakterii z przypadków piodermii psów i ocena ich wrażliwości na antybiotyki najczęściej używane w dermatologii weterynaryjnej).

Publication: Annales UMCS, (Lublin) sectio DD, 61, 135–141. 2006. In Polish, summary in English.

WILKOŁEK P., SZCZEPANIK M., GOŁYŃSKI M.: Adverse skin drug reactions in the dogs.
(Niepożądane polekowe reakcje skórne u psów).

Publication: Weterynaria w Praktyce, 3, 42–47, 2006. In Polish.

WILKOŁEK P., SZCZEPANIK M., KOVALIK M., GOŁYŃSKI M.: Demodecosis in dogs.
(Nużycza u psów).

Publication: Weterynaria w Praktyce, 6, 26–30. 2006. In Polish.

DEPARTMENT AND CLINIC OF ANIMAL REPRODUCTION

30 Głęboka, Lublin

Head: Prof. ordin. Dr habil. Władysław Wawron
Prof. extraordin. Dr. habil. Zygmunt Wrona
Prof. Dr. habil. Leszek Krakowski
Dr. habil. Marek Szczubiał

RESEARCH STUDIES (SUMMARIES)

Roland Kusy, Władysław Wawron

SEXUAL ACTIVITY OF ARABIAN MARES WITH ENDOMETROSIS IN WINTER SEASON

Aktywność płciowa klaczy czystej krwi arabskiej z endometrosis w sezonie zimowym

Illnesses of genital tracts, often complicated with inflammation and degenerative processes in *endometrium* and disturbances in ovarian function reduce fertility of mares. The aim of the study was to estimate ovarian activity and assessment of intranuclear estrogen receptor in *endometrium* of mares with endometrosis. The study was performed before breeding season (December – January) on 13 Arabian mares which suffered from average and strongly advanced degenerative changes in *endometrium*. Three times in 2-week-periods there were performed ovarian ultrasonography and progesterone concentration estimated in serum (examines: I, II, III). Twice (at follicle size < 20 mm and > 25 mm) segments of *endometrium* were collected by biopsy and quantity of intranuclear estrogen receptors in each layer of *endometrium* estimated. In period of 29 days in most of mares (8 animals, 62%) ovarian cycle occurred and finished with ovulation. At remaining 5 animals (38%) there were detected: atresia of dominant follicle (2 mares), anovulatory haemorrhagic follicle (2 mares), corpus luteum persistent (1 mare). Average concentrations of serum progesterone in two examinations (I and III) clearly exceeded value 1 ng/ml ($p \leq 0,05$ between I and

II aminations). Stronger expression and greater score of immunoreactivity estrogen receptor in each layer of *endometrium* were noted, when on ovary large follicles ($p \leq 0,01$) were found.

Publication: Medycyna Wet. (Lublin), 62, 207–211, 2006, fig. 9, tab. 1. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

SZCZUBIAŁ M., DĄBROWSKI R., WAWRON W., KUSY R: Antioxidative status of uterus during pyometra in bitches. (Status antyoksydacyjny macicy podczas ropomacicza u suk).
Ref. Conference of the European Society Domestic Animal Reproduction (ESDAR),
7–9 IX 2006, Portorož-Lipica, Slovenia.

Publication: Reproduction in Domestic Animals, 41, 358, 2006.

DEPARTMENT AND CLINIC OF ANIMAL SURGERY

30 Głęboka, Lublin

Head: Prof. dr. habil. Piotr Silmanowicz
Dr. habil. Ireneusz Balicki

RESEARCH STUDIES (SUMMARY)

Ireneusz Balicki

RESEARCH ON DMSO AND DEXAMETHASONE APPLICATION FOR CHRONIC SUPERFICIAL KERATITIS TREATMENT IN DOGS

The aim of work was comparison of eye drops application containing 50% solution of DMSO applied commonly with dexamethasone or containing dexamethasone alone to treat chronic superficial keratitis. A method for long lasting treatment of chronic superficial keratitis with use of DMSO and cyclosporine has been elaborated. Photos with calibrated net on corneal surface were used for evaluation of treatment results in particular groups, by setting percentage of corneal changes before and 5, 32 and 48 weeks after beginning of treatment. During the treatment, corneal epithelium cells impressive cytology evaluation was performed by millipore filters. The examinations revealed that combined administration of 50% DMSO solution and dexamethasone in form of eye drops is a more effective way of chronic superficial keratitis treatment compared to dexamethasone administration alone. Initial chronic superficial keratitis treatment may be continued by use of DMSO and cyclosporine. Cytological examinations of epithelium corneal cells did not reveal any harmful effect of 12 months DMSO and cyclosporine corneal sac administration.

Publication: Scient. Messeng, L.N.A.V.M. (Lwów) 8, 192–195, 2006. In English, summary in English.

Henryk Krukowski, Andrzej Lisowski, Paweł Różański, Izabela Polkowska

THE LEVEL OF IGG IN MASTITIC COW MILK

Poziom IgG w mleku mastitowym krów

The objective of study was to determine IgG (total) concentrations in milk from cows with different forms of mastitis and in mastitic milk depending on etiological factor. The studies included 37 milk samples obtained from Black-and-White cows crossbred with Holstein-Friesian cattle.

Publication: Rocz. Nauk. Pol. Tow. Zootechn. (Kraków) 2, 65–69, 2006, tab. 2. In Polish, summary in English.

Izabela Polkowska, Maciej Orzelski

CONSERVATIVE PERIDONTAL THERAPY IN DOGS WITH THE COOPERATION OF THE OWNER

Zachowawcze leczenie paradontopatii psów z udziałem właściciela

The authors described the basic stomatological procedures in dogs, which should be performed with the owner cooperation. The proper technique of polishing, cleaning and flushing with antiseptic was described.

Publication: Magazyn Wet. 15, 20–22, 2006, fig. 11. In Polish.

Aleksandra Sobczyńska-Rak, Wojciech Łopuszyński,
Piotr Silmanowicz, Jacek Piórkowski

ESOPHAGUS CARCINOMA IN DOG – ENDOSCOPY AND PATHOMORPHOLOGY ASSESSMENT

Rak przełyku u psa – ocena endoskopowa i patomorfologiczna

Neoplasms of esophagus are very rare in dogs. They account for 0,5% of all tumors. In the presented case the development of carcinoma was latent. The first symptoms were hypersalivation, vomiting, the backward flow and difficulty in swallowing of solid food. Subsequently the dog was not able to swallow fluids. Hyperleucocytosis, lymphocytosis, monocytosis, anemia and elevated alkaline phosphatase level in the serum suggested tumor growth. Esophagoscopy was

performed and oesophagostenosis confirmed: a tumor with hemorrhagic focuses, ulcer formations and erosions were observed. The dog was subjected to euthanasia. Specimens for histological examination were taken. The histology and immunohistological analysis confirmed the diagnosis of squamous cell carcinoma.

Publication: Medycyna Wet. (Lublin) 62, 550–552, 2006, fig. 5. In Polish, summary in English.

Tomasz Szponder, Adam Brodzki, Maciej Orzelski,
Izabella Polkowska, Artur Bielawski

THE USE OF FIBRYN GLUE IN SMALL ANIMAL SURGERY

Zastosowanie kleju fibrynowego w operacjach u małych zwierząt

The basic rules for fibrin glue use in veterinary stomatology, ophthalmology and orthopedy were described.

Publication: Magazyn Wet. 1, 34, 2006, fig. 4. In Polish.

REPORTS TO RESEARCH MEETING

BALICKI I.: Corneal laceration and penetrating injuries (Rany rogówki i obrażenia perforujące).

Ref. I Ophthalmological Congress: „Emergency cases in ophthalmology of dogs”, Košice, 24 II 2006.

Publication: Proceedings of the I Ophthalmological Congress: „Emergency cases in ophthalmology of dogs”, 7, 2006. In Slovak.

BALICKI I.: Severe corneal ulcerations, descemetocoele and iris prolapse (Głębokie owrzodzenia rogówki, pęcherzyk rogówki i wypadnięcie tęczówki).

Ref. I Ophthalmological Congress: „Emergency cases in ophthalmology of dogs”, Košice, 24 II 2006.

Publication: Proceedings of the I Ophthalmological Congress: „Emergency cases in ophthalmology of dogs”, 8, 2006. In Slovak.

BALICKI I.: The DMSO, corticosteroids and cyclosporine application for chronic superficial keratitis treatment in dogs. (Zastosowanie DMSO, kortykosteronu i cyklosporyny w leczeniu przewlekłego, powierzchownego zapalenia rogówki).

Ref. Ophthalmology – the latest methods of diagnostics and treatment. Lublin 23 IV 2006.

Publication: Proceedings WSAVA Eastern European Continuing Education Project „Ophthalmology – the latest methods of diagnostics and treatment”, 16–20, 2006.

OTHER PUBLICATIONS

SILMANOWICZ P.: Treatment of hip and elbow dysplasia. (Leczenie dysplazji stawu łokciowego i biodrowego).

Publication: Dysplazja stawów biodrowych i łokciowych. Pol. Stow. Lek. Wet., Lublin 73–90, 2006. In Polish.

BALICKI I., TRBOLOVA A.: Corneal wounds – diagnostics and treatment (Rany rogówki – rozpoznawanie i leczenie).

Publication: Magazyn Wet. 15, 4–8, 2006. In Polish.

LABORATORY OF VETERINARY RADIOLOGY AND ULTRASONOGRAPHY

30 Głęboka, Lublin

Head: Dr. Renata Komsta

RESEARCH STUDIES (SUMMARIES)

Renata Komsta

ANALYSIS OF CHOSEN FACTORS INFLUENCING THE LATE RECOGNITION OF FRAGMENTATION OF THE MEDIAL CORONOID PROCESS IN DOGS

Analiza wybranych czynników wpływających na późne rozpoznawanie fragmentacji
przyśrodkowego wyrostka dziobiastego u psów

The aim of this study was to estimate some factors that were contributing to development and detection of fragmentation of the medial coronoid process (FMCP). The study was performed on a group of 51 large- and giant-breed dogs with recognized FMCP. The analysis of the information gathered from dogs' owners showed that, in general, they had problems of detecting any irregularities in their dogs' health and behaviour showing that the disease is developing. Symptoms of FMCP, when unaccompanied by other osteopathies were very weak. That was the cause of not reporting to the veterinarian at the beginning period of this disease. It can be predicted that if clear lameness appears in a young dog and it is easy to be noticed by its owner, the simultaneous development of a few clinical forms of osteochondrosis and other diseases of the osteogenesis period can be suspected. Most of the dogs (66.7%) suffered from FMCP and from one of other diseases: panosteitis, osteochondrosis dissecans, ununited anconeal process, hypertrophic osteodystrophy. The appearance of a few skeletal system conditions, each one manifested itself with a various degree of pain intensification, could make it difficult for veterinarians to locate exactly the illness process.

Publication: Bull. Vet. Inst. Pulawy, 50, 409–412, 2006, In Polish, summary in English.

REPORTS OF RESEARCH MEETING

KOMSTA R., DĘBIAK P., TWARDOWSKI P., LISIAK B.: Efficiency of diagnosis elbow dysplasia in dogs – own observations. (Skuteczność rozpoznawania dysplazji łokciowej u psów – obserwacje własne).

Ref.: Seminar of Polish Small Animal Veterinary Association, Section of Diagnostic Imaging and The Faculty of Veterinary Medicine, Agricultural University in Lublin, „Elbow and hip dysplasia in dogs”, Lublin 12 XI 2006.

Publication: Monograph – Materials of seminar Polish Small Animal Veterinary Association, Section of Diagnostic Imaging and The Faculty of Veterinary Medicine, Agricultural University in Lublin, „Elbow and hip dysplasia in dogs”, 91–94, 2006, In Polish.

OTHER PUBLICATION

TWARDOWSKI P., DĘBIAK P., LISIAK B.: Diagnostic radiology of foreign bodies in dog and cat stomach and intestines. (Rozpoznawanie radiograficzne ciał obcych w żołądku i jelitach u psów i kotów).

Publication: Magazyn Wet. 15, 15–17, 2006. In Polish.

DEPARTMENT OF EPIZOOTIOLOGY AND CLINIC OF INFECTIOUS DISEASES

30 Głęboka, Lublin

Head: Prof. ordin. Dr. habil. Zdzisław Gliński
Prof. extraordin. Dr. habil. Zbigniew Grądzki
Prof. extraordin. Dr. habil. Krzysztof Kostro
Prof. extraordin. Dr. habil. Stanisław Winiarczyk

RESEARCH STUDIES (SUMMARIES)

Łukasz Adaszek, Stanisław Winiarczyk, Jacek Kutrzuba,
Monika Skowron, Piotr Dębiak

INFECTION OF TREMATODES IN *Buteo buteo* FOLLOWED BY SEVERE INTOXICATION

Inwazja przywr przyczyną ciężkiej intoksykacji myszolowa (*Buteo buteo*)

The objective of this paper was to recognize the etiological factor of the disease in bird *Buteo buteo* with symptoms of apathy, diarrhoea, and paralysis. The clinical and radiological examination was done. Parasitological examination of the feces collected from bird revealed a large amount of trematodes cysts. After therapy with antiparasitological drugs, sulfonamids, vitamins and fluids for the period over three weeks, we observed full recovery of this bird.

Publication: Życie Wet. 81, 682–684, 2006 fig 2. In Polish, summary in English.

Zbigniew Grądzki, Anna Ziętek, Emilia Hetman, Stanisław Winiarczyk

**PREVALENCE OF *Rhodococcus equi* STRAINS IN SOIL SAMPLES
FROM STUDS WITH RHODOCOCOSIS**

Występowanie szczepów *Rhodococcus equi* w glebie w stadninach z rodokokozą

The objective of the study was to assess the prevalence of virulent and non-virulent *R. equi* strains in horse farms with enzootic and sporadic rhodococcosis. Based on the microbiological culture, the progressive growth of the number of bacteria in soil samples was found which was correlated with the air temperature growth and independent of the farm epizootic status. The number of virulence strains in the soil was dependent on the sample collection time and type of stud. PCR is the useful method to classify bacteria as a *R. equi* species and to detect the virulence marker. Comparison of microbiological culture and PCR suggests caution in interpreting culture results in terms of identifying all bacterial colonies as belonging to *Rhodococcus equi* species.

Publication: Medycyna Wet. (Lublin), 62, 1310–1313, 2006, tab. 3. In Polish, summary in English.

Krzysztof Kostro, Michał Krakowski, Leszek Krakowski,
Katarzyna Wojcicka-Lorenowicz

**THE INFLUENCE OF UNSPECIFIC IMMUNOSTIMULATION ON THE LEVEL
OF HAPTOGLOBIN IN SERA OF FEMALE POLAR FOXES
IN A REPRODUCTIVE PERIOD**

Wpływ nieswoistej immunostymulacji na kształtowanie się poziomu haptoglobiny
w surowicy samic lisów polarnych w okresie rozrodu

There was determined the influence of unspecific immunostimulation on the level of haptoglobin (Hp) in sera of female polar foxes in a reproductive period. A statistically significant increase of the Hp level in sera of female foxes before immunostimulation resulted from a developing infectious inflammatory process in the reproductive tract. The serum level of Hp in sera of the females stimulated unspecifically approached the physiological values. However, in sera of the females from a control group the concentration of Hp persisted on a high level during the whole period of the experiment. The evaluation of health state of animals on the basis of the concentration of serum Hp lowers a risk of transmission of diseases in farms of breeding foxes and hence decreases economical losses. The determination of the concentration of Hp in sera of female polar foxes may be a useful criterion for the evaluation of their health state in a reproduction period and efficacy of the unspecific immunostimulation used.

Publication: Medycyna Wet. (Lublin) 62, 842–845, 2006, fig. 3. In Polish, summary in English.

Krzysztof Kostro, Katarzyna Wojcicka-Lorenowicz, Kinga Leśniewska,
Jacek Madany, Barbara Majer-Dziedzic

**FLOW CYTOMETRIC EVALUATION OF PHAGOCYTIC ACTIVITY AND OXYGEN
METABOLISM IN GRANULOCYTES OF PERIPHERAL BLOOD OF RABBITS
WITH CHRONIC TRICHOPHYTOSIS**

Cytometryczna ocena aktywności fagocytarnej i metabolizmu tlenowego granulocytów
krwi obwodowej u królików z przewlekłą trichofitozą

The objective of the present study was to evaluate the activity of peripheral blood granulocytes in rabbits with chronic trichophytosis with commercial kits Phagotest and Burstest adopted to flow cytometry. In rabbits with chronic trichophytosis, strong suppression of unspecific cellular immune responses was found. Once established, fungal infection can only be destroyed by T cell-mediated mechanisms. T cells primarily function by activating macrophages and promoting epidermal growth and keratinization. The destroyed unspecific immune mechanisms are manifested by decreased phagocytic activity and oxygen metabolism of granulocytes. Therefore, it is reasonable to assume that in therapy of chronic trichophytosis in rabbits with vaccinotherapy, unspecific immunity should be modulated in order to restore destroyed mechanisms of unspecific immunity. Their normal function is a prerequisite for the development of specific antifungal immunity.

Publication: Medycyna Wet. (Lublin) 62, 423–426, 2006, fig. 4. In Polish, summary in English.

Michał Krakowski, Krzysztof Kostro

**STIMULATION OF NONSPECIFIC IMMUNITY IN FEMALE POLAR FOXES
IN THE SECOND PART OF PREGNANCY AND HEALTH STATE OF THEIR PROGENY**

Wpływ immunostymulacji na odporność nieswoistą samic lisów polarnych
w drugiej połowie ciąży i zdrowotność ich potomstwa

Isoprivet and Levamisole used twice at therapeutic doses were well tolerated by pregnant polar foxes. Used at the second part of pregnancy by increasing the metabolic, phagocytic and bactericidal activity of neutrophils, serum level of lysozyme and IgG, they restored the disturbed functions of cellular and humoral

nonspecific defense mechanisms of pregnant foxes. The existing strong correlation between the level of serum lysozyme and IgG may be used to evaluate the health state of foxes at the second part of pregnancy. It can also be used for prognosis of the disturbances of the periparturient period in polar foxes.

Publication: Annales UMCS (Lublin), sectio DD, 61, 219–228, 2006, fig. 8. In Polish, summary in English.

Michał Krakowski, Krzysztof Kostro

**EVALUATION OF ISOPRIVET AND LEVAMISOLE FOR STIMULATION
OF NONSPECIFIC IMMUNITY IN FEMALE POLAR FOXES
AND HEALTH STATE OF THEIR PROGENY**

Ocena wpływu Isoprivetu i Lewamizolu na odporność nieswoistą samic lisów polarnych i zdrowotność ich potomstwa

It was found that the disturbances of nonspecific immunity are the main cause of failure in reproduction in female polar foxes. The level of nonspecific cellular and humoral immune response is a valuable tool for monitoring of health state of animals in the period of reproduction. Nonspecific stimulation of female polar foxes with Isoprivet and Levamisole at the reproduction period increases activity of nonspecific cellular and humoral mechanisms of antinfectious immunity. The use of the immunostimulators restored the disturbed mechanisms of immune responses in the female polar foxes, and hence the better results in reproduction of breeding foxes were obtained.

Publication: Annales UMCS (Lublin), sectio DD, 61, 207–217, 2006, fig. 8. In Polish, summary in English.

Mariusz Pliszczyński, Mariusz Chelmiński, Katarzyna Bizoń

**HEMOCYTIC IMMUNE PARAMETERS OF THE WINTERING WORKERS
OF THE HONEY BEE *Apis mellifera* L. (Apidae)**

Parametry odporności komórkowej u robotnic pszczoły miodnej w okresie zimowania

The innate immune system of the honey bee, *Apis mellifera* L., consists of cellular components involved in response to intruding foreign microorganisms and environmental stress factors. To evaluate the efficacy of the cellular part of

the immune defense of the wintering bees the differential hemocyte count, phagocytosis and Wright's number were examined in native insects and in insects induced by intrahaemocolic injection of live cells of *E. coli* D31. The comparative studies in three periods of the bee colony development (wintering, pre- and post-wintering periods) enabled to determine the differential hemocyte count of the wintering bees and showed that the wintering bees possessed efficient system of cellular immune defense represented by discrimination of self from non self and phagocytosis. Two types of hemocytes, plasmatocytes (PL) and granular hemocytes (GR) appeared to play a main role in the cellular immune functions.

Publication: Annales UMCS (Lublin) sectio DD, 41, 157–172, 2006, fig. 13, tab. 3. In Polish, summary in English.

Mariusz Pliszczynski, Dorota Luft-Deptuła, Katarzyna Bizoń

**MONITORING OF IMMUNITY IN WINTERING WORKERS
OF THE HONEY BEE *Apis mellifera* L. (*Apidae*) BY A PROTECTION TEST**

Monitorowanie odporności zimujących robotnic pszczoły miodnej
Apis mellifera L. (*Apidae*) w oparciu o test działania ochronnego

One of the most remarkable and important research objectives in prevention and control of microbial diseases is to monitor the level of natural and induced immune response. Among the different tests, the protection test is suitable for insect pathology. Groups of non immunized worker bees, *Apis mellifera* L., wintering (group B), late autumn (group A) and early spring (group C) bees and bees injected with a live cells of *Escherichia coli* D31 were and challenged with an LD₁₀₀ dose of viable *Pseudomonas aeruginosa* and the survival percent in each group was calculated 96 h post challenge. The lowest level of protection was found in wintering non induced (65,0 ±1,4%), induced and challenged (71,1 ±2,4%) and only induced (82,0 ±1,8%) bees. In the late autumn bees and in the early spring bees the values of the protection test were significantly higher: 74,3 ±2,5%, 80,0 ±1,2%, 91,2 ±0,9%, and 74,2 ±1,9%, 89,0 ±2,0%, 90,0 ±1,8%, respectively.

Publication: Annales UMCS, (Lublin) sectio DD. 41, 173–178, 2006, tab. 1. In Polish, summary in English.

Mariusz Pliszczynski, Dorota Luft-Deptuła, Katarzyna Bizoń,
Mariusz Chełmiński

**HUMORAL IMMUNE DEFENSE OF THE WINTERING WORKERS
OF THE HONEY BEE *Apis mellifera* L. (Apidae)**

Odpowiedź humoralna zimujących robotnic pszczoły miodnej *Apis mellifera* L. (Apidae)

The second and more important line of defense of the honey bee, *Apis mellifera* L., is well developed capacity to discriminate between *self* and *non-self* and to kill microbial invaders by hemocytic and humoral immune responses. In the haemocoel antimicrobial peptides and proteins are expressed constitutively (lysozyme) or are readily inducible (lysozyme hypersynthesis on infection and *de novo* synthesized apidaecins). The influence of wintering on the honey bee humoral immune response was investigated. The internal defense system of the wintering honey bee represented by humoral components is well developed. The native level of blood lysozyme in the three periods of investigations was low. Lysozyme was strongly recruited for immune function in wintering non-induced and *E. coli* D31 induced honey bees. The highest expression of apidaecins was induced 72 h after intrahaemocoelic injection of live cells of *E. coli* D31 in bees before wintering and in wintering bees.

Publication: Annales UMCS (Lublin) sectio DD, 41, 179–188, 2006, fig .4, tab. 1. In Polish, summary in English.

Stanisław Winiarczyk, Łukasz Adaszek, Agnieszka Dżiduszko,
Zbigniew Grądzki, Jacek Madany, Maciej Skrzypczak

APPLICATION OF PCR METHOD IN DIAGNOSIS OF CANINE DISTEMPER VIRUS

Zastosowanie reakcji PCR w diagnostyce nosówki psów

The objective of this study was to estimate the utility of PCR method in diagnosis of canine distemper. A group of 4 healthy, vaccinated dogs (Canivac F Biowet Puławy) and a group 14 sick animals with symptoms of distemper were used in this experiment. Specimens of blood from all dogs were collected, isolation of leucocytes, extraction of RNA, reverse transcription was done. The obtained cDNA was used in RT-PCR. Genetic material of virus in leucocytes of all vaccinated animals, was detected by RT-PCR between 6–19 and by nested PCR between 2 and 24 day after immunization. In the group of sick animals RT-PCR was positive in 3 dogs and nested PCR in 9 additional dogs.

Publication: Medycyna Wet. (Lublin) 62, 840–842, 2006. In Polish, summary in English.

Stanisław Winiarczyk, Łukasz Adaszek, Jacek Kutrzuba, Piotr Barszcz

SEVERE CHLAMYDIOSIS IN PERSIAN CAT

Ciężki przebieg chlamydiozy u kota perskiego

The objective of this study was to recognise an etiological factor of disease in 1,5 years old cat with symptoms of conjunctivitis and pneumonia. The bacteriological, cytological and radiological examination was done. The swabs from nasal cavities were also examined with speed diagnostic test for chlamydiosis. On the basis of results we diagnosed chlamydiosis. After therapy with sulfonamides and tetracyclines full restitutio ad integrum was confirmed in this case.

Publication: Życie Wet. 81, 543–545, 2006, fig 3. In Polish, summary in English.

OTHER PUBLICATIONS

GLIŃSKI Z., KOSTRO K., LUFT-DEPTUŁA D.: Diseases of honey bees. Immunity, pathology and therapy. (Choroby pszczół. Odporność, patologia, terapia)
Publication. Państwowe Wydawnictwo Rolnicze i Leśne, Warszawa 2006. pp.235. In Polish.

GLIŃSKI Z., KOSTRO K., CHEŁMIŃSKI M.: Antibacterial insect immune polypeptides in therapy of infections in animals, humans and plants. (Poliptydy przeciwdrobnoustrojowe owadów alternatywą w leczeniu zakażeń zwierząt, ludzi i roślin).
Publication: Życie Wet. 81, 31–35, 2006.

GLIŃSKI Z., KOSTRO K.: Lumpy skin disease. (Guzowata choroba skóry bydła)
Publication: Życie Wet. 81, 467–469, 2006.

GLIŃSKI Z., KOSTRO K.: Phylogenesis of anti-infections immunity in animals. Part I. Invertebrates. (Filogeneza odporności przeciwzakaźnej u wybranych grup zwierząt. Część I. Bezkręgowce).
Publication: Życie Wet. 81, 671–675, 2006.

GLIŃSKI Z., KOSTRO K.: Phylogenesis of anti-infectious immunity in animals. Part II. Vertebrates. (Filogeneza odporności przeciwzakaźnej u wybranych grup zwierząt. Część II. Kręgowce).
Publication: Życie Wet. 81, 812–815, 2006.

DEPARTMENT OF FOOD HYGIENE OF ANIMAL ORIGIN

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Elżbieta Pełczyńska
Prof. Dr. habil. Krzysztof Szkucik
Dr. habil. Zygmunt Nowakowski

RESEARCH STUDIES (SUMMARIES)

Ryszard K. Pisarski, Krzysztof Szkucik, Iwona Pijarska, Henryk Malec

CARCASS CHARACTERISTICS, CHEMICAL COMPOSITION AND SENSORIAL EVALUATION OF MEAT FROM BROILER CHICKENS FED HULL-LESS BARLEY

Cechy rzeźne tuszek, skład chemiczny tkanki mięśniowej i ocena sensoryczna mięsa
kurcząt brojlerów żywionych jęczmieniem nagoziarnistym

The aim of the research was to investigate the effect of complete feeds containing as much as 45–50% of hull-less barley on broiler carcass characteristics, the basic sensory traits and chemical composition of breast and thigh muscles, with a special concern to the content of intramuscular and abdominal fat and their FA profile.

The influence of barley variety on the carcass characteristics was ambivalent. A disadvantageous effect of hull-less barley on the weight of breast and thigh muscles was noted. Feeding hull-less barley also decreased the content of crude protein and increased the share of fat in the examined muscles. However, the increased share of intramuscular fat was believed to improve tenderness and juiciness, especially with respect to the thigh muscles. Compared to regular barley, the hull-less variety significantly increased the share of C16:1 and C18:1 fatty acids in both intramuscular and abdominal fat, whereas it decreased the level of C18:2. Consequently, the sums of MUFA and PUFA differed significantly.

Publication: Medycyna Wet. (Lublin) 62, 74–76, 2006, tab. 4. In Polish, summary in English.

Krzysztof Szkucik, Krzysztof Libelt

NUTRITIONAL VALUE OF RABBIT MEAT

Wartość odżywcza mięsa królików

The aim of the study was to define the basic composition of the muscle meat of rabbits as well as determining its nutritional value in relation to muscle type. The research material consisted of muscles taken from three different types of rabbit meat (shoulder, thigh, saddle).

The chemical parameters (water, fatty content, protein and collagen) were noted. The biological value of protein was defined on the basis of the exogenic amino acid content, counting the chemical score (CS) and protein efficiency ratio (PER) defined on Wistar rats.

The study indicates that saddle has the highest culinary value in rabbits. Its muscles contained the lowest collagen and fat content, and the highest protein content which, additionally also had the highest PER value. The thigh muscles contained a significantly higher percentage of collagen and fat but their protein level was comparable to that of the saddle and had a similar PER value. The shoulder muscles contained the least valuable chemical composition and a significantly lower PER value. Protein in rabbits muscles have a valuable, almost ideal, exogenic amino acid content, with the exception to the shoulder muscles, which have a significantly lower level of tryptophan. The restricting amino acid used in the study was isoleucyn (CS = 61.82).

Publication: Medycyna Wet. (Lublin) 62, 108–110, 2006, tab. 3. In Polish, summary in English.

Krzysztof Szkucik, Renata Pysz-Łukasik

pH VALUE OF RABBIT MEAT

Wartość pH tkanki mięśniowej królików

The aim of the study was to evaluate pH changes of rabbit meat depending on the time following slaughter and a muscle type.

The study was performed on carcass from rabbits with the final body weight of 4.5–5.0 kg. pH values measurements were performed immediately after skin removal and 15 and 60 min after that. Moreover, pH values were measured after 12, 24, 72 and 144 h of storage, respectively. pH measurements were performed

using pH-Star-Pistole apparatus, equipped with electrode that was placed into three different muscles: the saddle, the thigh muscle and the scapula. Our investigations showed a progressive pH value decrease up to 12 h after slaughter when the highest acidification was reached. Furthermore, the pH values were constant until 24 hours after slaughter. After 24 h of meat storage, the increase of pH values was observed reaching neutral level on 6th day after slaughter. Significant differences of pH values were noted in all the investigated muscles of the carcass within each time period. The lowest value of pH was measured in the saddle, higher in the thigh, whereas the highest in the scapula.

Publication: Annales UMCS, (Lublin) sectio DD, 61, 115–118, 2006, tab. 1. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

PASZKIEWICZ W., PEŁCZYŃSKA E.: Expertises for court and police as activity of Department of Food Hygiene of Animal Origin, Agricultural University in Lublin. (Ekspertyzy sądowo-policyjne w działalności Katedry Higieny Żywności Zwierzęcego Pochodzenia Akademii Rolniczej w Lublinie).

Publication: Proceedings of the Conference on Law Activities in Veterinary Medicine, 11–12, 2006. In Polish.

PROST E.K.: Veterinary surgeons in court trials. (Lekarze weterynarii w rozprawach sądowych).

Publication: Proceedings of the Conference on Law Activities in Veterinary Medicine, 9–10, 2006. In Polish.

SZKUCIK K., PISARSKI R.: Variability in the chemical composition and sensory evaluation in broiler chickens meat in relation to their slaughter age. (Zmienność składu chemicznego i cech sensorycznych mięsa krucząt brojlerów w zależności od wieku ubojowego).

Ref. Scientific Conference „Meat in technology and human nutrition”. Lublin 21–22 IX 2006.

Publication: Proceedings of scientific conference: „Meat in technology and human nutrition”. 123–126, 2006. Summary in Polish and English.

OTHER PUBLICATIONS

PROST E.K.: Morbidity and mortality among veterinary surgeons. (Zachorowalność i śmiertelność wśród lekarzy weterynarii).

Publication: Medycyna Wet. (Lublin) 62, 583–585, 2006. In Polish.

PROST E.K.: Dr Marian Ignacy Janiak – recalling the unusual life experiences of the Polish veterinary surgeon (Dr Marian Ignacy Janiak – wspomnienie niezwykłych losów polskiego lekarza weterynarii).

Publication: Medycyna Wet. (Lublin) 62, 723–725, 2006. In Polish.

PROST E.K.: Slaughter animals and meat – evaluation and hygiene. (Zwierzęta rzeźne i mięso – ocena i higiena).

Publication: Lubelskie Towarzystwo Naukowe, Lublin 2006, pp. 431. In Polish.

DEPARTMENT OF PATHOLOGICAL ANATOMY

30 Głęboka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Hanna Bis-Wencel, Zbigniew Nozdryn-Płotnicki, Leon Saba, Andrzej Zoń,
Antoni Kopczewski, Agnieszka Sroka

INFLUENCE OF PRESERVATIVES ON THE HISTOPATHOLOGICAL PICTURE OF SOME INTERNAL ORGANS OF MINKS

Wpływ konserwantów na obraz histopatologiczny narządów wewnętrznych norek

The study was conducted at the „scanbrown” mink breeding farm. After weaning, the animals were divided into two groups, 50 units each (I treatment, II control). Both groups were fed a diet of an identical composition and energy level, but group I received dietary preservative and antioxidant additives. Sodium pyrosulphite was added at a dose of 0.2–0.3% ready feed mass and Hadox antioxidant at a dose of 0.15–0.20 g per 1 kg ready feed until November.

The slaughtered animals (10 units from each group) were subjected to postmortem and pathomorphological examinations. Histopathological examinations were carried out on sample specimens of the internal organs essential to the digestive and absorption processes and metabolism (stomach and duodenum, small intestine, large intestine, liver, kidneys). The feed preserved with sodium pyrosulphite and Hadox antioxidant did not show microbiological contamination at a level which would be hazardous to animal health. Supplementing the feed with a preservative and antioxidant resulted in variation within the histopathological changes in the liver of both groups of animals. The kidneys were reported to show slight epithelium steatosis of the I order and convoluted tubules. No pathological changes were recorded in the images of the mink`s alimentary tract.

Publication: Medycyna Wet. (Lublin) 62, 70–73, 2006, fig. 7. In Polish, summary in English.

Agnieszka Jasik, Wojciech Łopuszyński, Zbigniew Nozdryn-Płotnicki,
Wojciech Kozaczyński

IMMUNOHISTOCHEMICAL ANALYSIS OF CANINE HAEMANGIOPERICYTOMAS

Immunohistochemiczna analiza obłoniaków u psów

The objective of the study was an attempt to elucidate canine haemangiopericytoma histogenesis based on immunohistochemical analysis using a range of commercially available antibodies. Seventeen canine haemangiopericytomas were examined. Histological analysis revealed the presence of spindle cells arranged in a circular pattern around capillaries („fingerprint pattern”) or interlacing bundles. Fingerprint patterns constituted a distinguishing feature in all examined haemopericytomas. Immunohistochemical analysis revealed positive expressions of vimentin, neuron-specific enolase (NSE), glial fibrillary acidic protein (GFAP), S-100 protein (S-100) and smooth muscle actin (α -SMA). Negative reactions in tumor cells were observed for cytokeratin (CK), desmin (DES), epithelial membrane antigen (EMA) and VIII-related antigen factor (FVIII). Positive expression of neuronal markers may not necessarily reflect the neural origin of tumors due to their low specificity. Immunoreactivity for α -SMA and DES negativity may suggest the presence of vascular smooth muscle cells of pericytic origin. Moreover, the α -SMA antibody may be useful for a differential diagnosis of canine haemangiopericytomas.

Publication: Medycyna Wet. (Lublin) 62, 909–912, 2006, fig. 5, tab. 2. In Polish, summary in English.

Piotr Listos

EUROPEAN UNION LAW AND FIGHTING RABIES WITHIN THE TERRITORIES OF THE MEMBER STATES

Regulacje prawne Unii Europejskiej a zwalczanie wścieklizny w państwach członkowskich

The issue of fighting rabies is reflected in the European Union law. Every individual country may tackle the problem of rabies on its territory realizing

programs devised within its own scope. 422 cases of rabies in animals were reported between 2000 and the first quarter of 2004 in the European Union countries. There were no cases of rabies during the above period in Ireland, Luxembourg, Portugal, Italy and Sweden.

Publication: Medycyna Wet. (Lublin), 62, 234–237, 2006, fig.1. In Polish, summary in English.

Jacek Piórkowski

EFFECTIVENESS OF THE ALOPEVAC VACCINE AGAINST DERMATOMYCOSIS

Skuteczność szczepionki Alopevac przeciw grzybicy skórnej

Dermatophytes have the ability to invade keratinized tissue (hair, nails and skin). The invasion elicits a host response ranging from mild to severe. Local anti-dermatophyte immunity includes activation of macrophages, sensitization of T lymphocytes and the production of antibodies. Dermatophytes are eliminated from the skin by a cell-mediated immune reaction. Although antibodies play a small part in dealing with dermatophytosis, they somehow support phagocytosis and suppress adhesion of the fungus to host cell. The development of cell-mediated immunity correlated with delayed hypersensitivity is associated with clinical cure. Dermatophytoses are considered an important epidemiological problem. Therefore, all the latest efforts to develop an effective vaccine against ringworm are significant. However, the immunology of the dermatophyte infection still remains to be comprehensively examined.

Publication: Medycyna Wet. (Lublin), 62, 674–677, 2006, fig. 2, tab. 1. In Polish, summary in English.

Jacek Piórkowski, Zbigniew Nozdryn-Płotnicki, Piotr Listos

PATHOMORPHOLOGICAL DIAGNOSIS OF NEOPLASTIC CHANGES IN DOG'S PROSTATE

Diagnostyka patomorfologiczna nowotworów gruczołu krokowego u psów

The objective of the examinations was to define the kinds of neoplastic changes in dog's prostate using biopsy techniques and histopathological method.

Fifty dog's prostates received during the post mortem examination were used for the examination. In 14 cases neoplastic changes were diagnosed, 4 cases evidenced purulent inflammation, 17 no neoplastic growth, and 15 prostates had a normal structure. This article compares two described below methods of pathomorphological diagnosis demonstrating their usefulness and the complete agreement of received results.

Publication: Medycyna Wet. (Lublin), 62, 1016–1019, 2006, fig. 4, tab. 1. In Polish, summary in English.

DEPARTMENT OF PRECLINICAL VETERINARY SCIENCE

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Ryszard Bobowiec

SUB-DEPARTMENT OF PATHOPHYSIOLOGY

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Ryszard Bobowiec

RESEARCH STUDIES (SUMMARIES)

Ryszard Bobowiec, Michele Ducci, Franco Martelli,
Urszula Kosior-Korzecka, Elżbieta Tusińska

COLONIC WATER AND ION TRANSPORT UNDER THE INFLUENCE OF DEOXYCHOLIC ACID, THEOPHYLLINE AND ETHYLENEDIAMINETETRAACETATE IN RATS

The experiments (*in situ*) on isolated colonic loop in rats aimed at indicating the changes in the secretion/absorption of electrolytes and water under influence of such factors as deoxycholic acid (DCA), theophylline (T) and EDTA changing in various ways the transport mechanisms in colon. Temporary changes of water volume in the studied loop and ion movement were calculated after finding the marker concentration of PEG 4000. Contrary to the control solution, both DCA and T caused the secretion of water and electrolytes to the colon. Combining the two applied compounds decreased the response of colon. After applying EDTA a decrease of water absorption was observed instead of secretion. DCA caused elevated excretion of Na^+ and greatest, of all the substances used, increase of Cl^-

secretion, while T caused the highest secretion of sodium, decreasing the secretion of chloride. On the other hand, EDTA caused a considerable increase of NA^+ and a slight increase of Cl^- . The received secretive responses point out that the applied substances affect various transport processes in colon. The effect of EDTA results from its properties chelating Ca^{2+} ions inside the cells. It should be supposed that only non-conjugated bile acids, including DCA, increase the filtration to the colon beside the cells, giving rise of microscopic injuries of mucosa.

Publication: Annales UMCS (Lublin), sectio DD, 61, 189–196, 2006, fig. 3, tab. 1. In English, summary in English.

Michele Ducci, Sara Pacchini, Alberto Niccoloni, Angelo Gazzano,
Domenico Cerri, Joaquin Gadea, Ryszard Bobowiec,
Claudio Sighieri, Franco Martelli

**CONCENTRATIONS OF CARNOSINE, ANSERINE, L-HISTIDINE AND 3-METHYL
HISTIDINE IN BOAR SPERMATOZOA AND SHEEP MILK
BY A MODIFIED HPLC METHOD**

The present study deals with the application of high-performance-liquid-chromatography (HPLC) method for quantitative detection of carnosine, anserine, L-histidine and 3-methyl-L-histidine in biological material with o-phthaldialdehyde (OPA) post column derivatisation at the constant temperature of 50°C. For this purpose, some mobile-phases were prepared with scalar acetonitrile concentrations. Complete separation of all molecules, particularly for carnosine and 3-methyl-L-histidine, was obtained with a solution of acetonitrile and 6mM hydrochloric acid with 0.48 M sodium chloride (5%:95% v/v). Post column derivatisation reaction at temperature of 50°C allowed to obtain an increase in sensibility of all molecules. This method has been utilised for detection of histidine dipeptides in boar spermatozoa and in sheep milk. Concentrations (mean \pm S.E. nmol/ 10^9 spermatozoa) of carnosine (0.96 ± 0.14) and anserine (0.83 ± 0.18) in boar spermatozoa were significantly lower than those of L-histidine (52.85 ± 4.86) and 3-methyl-L-histidine (83.07 ± 7.1). Positive correlation was found between carnosine and anserine contents ($r = 0.740$; $p < 0.01$) and between L-histidine and 3-methyl-L-histidine ($r = 0.657$; $p < 0.01$). All histidine dipeptides studied were also present in 40 samples of sheep milk. In the case of samples without unit-forming colonies (UFC) of *Staphylococcus coagulase-positive*, carnosine concentrations (9.17 ± 0.89 nmol/ml) were higher than anserine (0.51 ± 0.02 nmol/ml) and both were significantly lower in respect to L-histidine (49.51 ± 6.48 nmol/ml) and 3-methyl-L-histidine (81.21 ± 6.82 nmol/ml). A negative correlation was observed between carnosine milk levels ($r = -0.773$;

$p < 0.01$) and UFC/ml of *Staphylococcus* coagulase-positive. In conclusion, this very simple and fast method can be used to detect histidine dipeptides in biological compartments where their concentrations are very low.

Publication: Pol. J. Vet. Sci. 9, 159–163, 2006, fig. 3, tab. 2. In English, summary in English.

Magdalena Fałkowska-Podstawka, Ryszard Bobowiec, Wojciech Rzeski

**THE EFFECT OF INTERFERON- τ AND OVARIAN STEROIDS
ON THE PROLIFERATION OF BOVINE ENDOMETRIAL CELLS *IN VITRO***

The objective of this study was to evaluate the effect of various concentrations of interferon-tau (IFN- τ) with or without steroid hormones, 17 β estradiol or progesterone, on the proliferation of bovine endometrial cells *in vitro*. Endometrial epithelial and stromal cells were isolated from the uterus of cows during the early estrus cycle (2–3 days) and incubated with different doses of IFN- τ with or without steroid hormones. The proliferation was determined by the MTT test in 48, 96, and 144 h of incubation. An antiproliferative activity of IFN- τ was observed both in epithelial and stromal cells cultured in RPMI 1640 medium supplemented with 10% FBS or serum replacement. However, epithelial cells were more sensitive to antiproliferative action of interferon-tau. Its activity was dose- and time-dependent. The inhibition of epithelial cell proliferation by 50% (ED₅₀) was obtained at concentrations of 500 U/ml, 340 U/ml, and 8.8 U/ml of IFN- τ after 48, 96, and 144 h of incubation, respectively. None of the doses of IFN- τ (10–10.000 U/ml) used inhibited stromal cell proliferation in 50%. The most effective dose of IFN- τ inhibiting stromal cell proliferation was 10.000 U/ml, which decreased cell growth by 17.08%, 22.87%, and 2.6% after 48, 96, and 144 h of incubation, respectively.

Steroid hormones, 17 β estradiol and progesterone, added to the culture of stromal cells with or without IFN- τ did not significantly modulate stromal cell growth. In contrast, a high concentration of progesterone (10⁻⁵ M) alone significantly enhanced stromal cell growth. Progesterone at low, physiological concentrations (10⁻⁷–10⁻⁹ M) ameliorated the antiproliferative activity of IFN- τ , especially at the 10⁻⁹ M concentration. At this concentration, the stimulatory effect on stromal cell growth was observed. The mechanisms of such response are not entirely clear but may arise from the influence of IFN- τ on progesterone down regulation of its own receptor. Depicted activity of IFN- τ may find usefulness in therapy of neoplastic disorders.

Publication: J. Vet. Sci. 9, 239–246, 2006, fig. 5, tab 2. In English, summary in English.

Urszula Kosior-Korzecka, Ryszard Bobowiec

**LEPTIN EFFECT ON NITRIC OXIDE AND GnRH-INDUCED FSH SECRETION
FROM OVINE PITUITARY CELLS *IN VITRO***

The secretion of gonadotrophins from anterior pituitary cells can be modulated by leptin and signals originating from the immune system, among others, by nitric oxide (NO). There are some studies that have demonstrated a role for leptin and NO in the regulation of FSH in rodents, however, no similar data are available in regard to ewes. Therefore, the objective of the present study was to analyse the leptin effect on GnRH-induced FSH secretion from the ovine anterior pituitary cells *in vitro*. Additionally, the influence of leptin on NO release and its role in the GnRH and leptin-modulated secretion of FSH from pituitary gland of ewes was investigated. The obtained results show that the influence of leptin on FSH secretion is biphasic. Leptin in concentration 10^{-8} and 10^{-7} M/l significantly enhances, whereas 10^{-6} and 10^{-5} M/l of leptin suppresses FSH secretion from the pituitary cells in comparison to the control. The secretion of FSH and NO release under the influence of leptin are in very high positive correlation ($r = 0.77$). The inhibition of NO synthesis with L-NAME, instead, unables leptin to stimulate FSH secretion.

Publication: J. Physiol. Pharmacol. 57, 637–647, 2006, fig. 6, tab. 1. In English, summary in English.

Urszula Kosior-Korzecka, Ryszard Bobowiec, Czesława Lipecka

**FASTING-INDUCED CHANGES IN OVULATION RATE, PLASMA LEPTIN,
GONADOTROPINS, GH, IGF-I AND INSULIN CONCENTRATIONS
DURING OESTRUS IN EWES**

The aim of this experiment was to study the changes in the hormonal status and ovulation rate (OR) evoked by starvation during the follicular phase of the oestrous cycle in ewes. For this purpose, 12 female crossbreed sheep were synchronized and then half of them were fasted from the 12th to the 16th day of the oestrous cycle. On the 16th day, analysis of hormones and insulin-like growth factor-I (IGF-I) were performed in 10-min intervals. Then, on the 6th day of the following oestrous cycle, the OR in all ewes was determined by laparoscopy. Fasting reduced significantly ($P < 0.05$) the OR in ewes (1.25 ± 0.50) in comparison with control (1.75 ± 0.50). The drop in the OR was coincident with a significant ($P < 0.001$) decrease in the plasma concentration and pulse amplitude of leptin (0.29 ± 0.08 ng/ml versus control 0.53 ± 0.14 ng/ml), the plasma level of luteinizing hormone (LH) (0.19 ± 0.06 IU/l versus 0.25 ± 0.09 IU/l

in control; $P < 0.05$) and the mean frequency of LH pulses (2.0/h versus 2.5/h in control). Fasting also resulted in a significant ($P < 0.05$) decrease in the plasma concentration and pulse amplitude of follicle stimulating hormone (FSH) in comparison with the control. Simultaneously, a significant ($P < 0.001$) decline in the IGF-I concentration in the fasted ewes (4.78 ± 0.91 ng/ml) was found in comparison with control (7.63 ± 1.85 ng/ml). Alike the levels of insulin were significantly ($P < 0.001$) lower in the fasted (178.99 ± 39.08 pM/l respectively) than in the control sheep (302.66 ± 49.01 pM/l respectively). Meanwhile, a double increase in the growth hormone (GH) pulses frequency and augmentation in its plasma concentrations as a result of starvation was noted. The obtained results show that the acute fasting exerts an inhibitory effect on the ovulation rate in ewes coincident with suppression in leptin, FSH and LH secretion and changes in signalization mediated by GH.

Publication: J. Vet. Med. A 53, 5–11, 2006, fig. 6, tab. 1. In English, summary in English.

Jan Marczuk, Józef Filar, Michele Ducci, Ryszard Bobowiec,
Urszula Kosior-Korzecka, Hubert Nowakowski

**APPLICATION OF THE STEWART MODEL FOR THE ANALYSIS
OF ACID-BASE DISTURBANCES IN DOGS WITH CHRONIC RENAL INSUFFICIENCY**

Zastosowanie modelu Stewarta do analizy zaburzeń równowagi kwasowo-zasadowej
u psów z przewlekłą niewydolnością nerek

The objective of these studies was to introduce the Stewart approach to analyse acid-base changes in dogs with the chronic renal failure (CRF). The acid-base status was investigated in 12 healthy dogs and 20 dogs with CRF. In the CRF affected dogs the level of urea and creatinin rose to 350 mg/dl and 394.8 μ mol/l respectively. The three independent variables (P_{CO_2} , SID-strong ion difference, and the A_{tot} -sum of net charges of nonvolatile plasma buffers (albumin + inorganic phosphate) together with the strong ion gap (SIG) were calculated by a method adopted from articles employing Stewart's approach. The SID averaged 41.85 and 48.81 mEq/l in normal and diseased dogs respectively. Nonvolatile plasma buffers (A_{tot}) were higher especially in more severely diseased dogs. The most considerable changes observed in affected dogs negative value of SIG (-28.03 mEq/l). The albumin value were significantly associated with the SID values. All the regarded estimates of SIG may be used as an accurate marker of CRF in dogs.

Publication: Medycyna Wet. (Lublin) 62, 837–839, 2006. fig. 3, tab. 1. In Polish, summary in English.

Marta Wójcik, Ryszard Bobowiec, Ewa Ćwiok

**CHANGES OF HEPATIC AND OXIDATIVE STRESS PARAMETERS
DURING EARLY LACTATION IN SHEEP WITH POSTPARTUM DISTURBANCES**

Lactation in sheep is a high-risk period associated with hepatic metabolic disturbances and oxidative stress. The aim of this study was to evaluate oxidative status in health and having prolapsed vagina sheep during lactation, using plasma malondialdehyd and ubiquinone Q10 concentrations. The next objective was to determine hepatic functional parameters during intensive hepatic metabolism in lactating sheep. The experiments were performed on sheep, divided into two major groups: I-control-health animals and II-experimental with diagnosed prolapsed vagina. Within these groups, sheep with single lamb and twins were separated. Plasma Q10 level and the profile and quantity of bile salts was analysed with HPLC method. Plasma concentration of MDA was measured by spectrophotometric method. The total glucose plasma level was determined in duplicate by the enzymatic method using a diagnostic KIT. Highest plasma concentration of MDA (2.56 ± 0.66 nM/ml) in sheep with PV having twins was observed. In comparison to health animals, postpartum disturbances in sheep with one lamb resulted in marked ($p \leq 0.05$) decrease of Q10 concentration. Under such condition plasma Q10 averaged 631.01 ± 154.6 ng/ml; 719.47 ± 34.78 ng/ml; 644.72 ± 53.36 ng/ml in first, second and third blood collecting period respectively. The opposite results were recorded in group of sheep having twins. On 17 day after parturition in all groups of animals plasma glucose level significantly decreased and reached minimum value (2.08 ± 0.32 mM/l) in HT sheep. The level of bile acids averaged 107.94 ± 22.06 μ M/l in HT group and 141.79 ± 16.52 μ M/l in PVT group. Our data obtained in the present study suggest that postpartum disturbances occurring in lactating sheep directly influenced hepatic activity and imbalanced oxidative status as well.

Publication: Acta Sci. Pol., Medicina Veterinaria 5, 117–125, 2006, fig. 3, tab. 1. In English, summary in Polish.

REPORTS TO RESEARCH MEETINGS

- BORUCH W.: Influence of physical exercise on plasma ubiquinone Q level in racehorses. (Wpływ wysiłku fizycznego na poziom ubichinonu Q w osoczu krwi koni sportowych.)
Ref.: XI International Conference Students Scientific Circle (Section of Veterinary), Wrocław 11–12 V 2006 r.
Publication: Proceedings of the XI International Conference Student Scientific Circle (Section of Veterinary), 87, 2006.
- DUCCI M., KOSIOR-KORZECKA U., BOBOWIEC R.: The influence of leptin, insulin and IGF-I on GnRH-induced LH secretion from porcine pituitary cells *in vitro*.
Ref. LX Annual Meeting of the Italian Society for Veterinary Sciences, Terrasini, 27–30 IX 2006.
Publication: Proceedings of the LX Annual Meeting of the Italian Society for Veterinary Sciences, 32, 2006. In English.
- KOSIOR-KORZECKA U., ZAŃ R., BOBOWIEC R.: Protective action of doxycycline and amoxicillin against H₂O₂ and Cd²⁺ – induced apoptosis and oxidative stress in ovine anterior pituitary cells *in vitro*.
Ref.: XXIII Congress of the Polish Physiological Society „Physiology without limits”, Warsaw, 14–16 IX 2006.
Publication: J. Physiol. Pharmacol. 57, suppl. 2, 165, 2006. In English.
- KOT K.: Changes in paraoxonase activity during early and late lactation in sheep. (Zmiany aktywności paraoksonazy w okresie wczesnej i późnej laktacji u owiec).
Ref.: XI International Conference Students Scientific Circle (Section of Veterinary), Wrocław 11–12 V 2006 r.
Publication: Proceedings of the XI International Conference Student Scientific Circle (Section of Veterinary), 88, 2006. In Polish.
- MARTELLI F., WÓJCIK M., BUONCRISTIANI P., BOBOWIEC R.: Changes of plasma lipoproteins and apolipoprotein E during lactating period in sheep.
Ref.: LX Annual Meeting of the Italian Society for Veterinary Sciences, Terrasini, 27–30 IX 2006.
Publication: Proceedings of the LX Annual Meeting of the Italian Society for Veterinary Sciences, 33, 2006. In English.
- SALETRA G.: The protective action of melatonin against hydrogen peroxidative and cadmium – induced oxidative stress in rams pituitary cells *in vitro*. (Protekcyjne działanie melatoniny na komórki przysadki mózgowej trzyczkó w *in vitro* w warunkach stresu oksydacyjnego indukowanego nadtlaniem wodoru i kadmem).
Ref.: XI International Conference Students Scientific Circle (Section of Veterinary), Wrocław 11–12 V 2006 r.
Publication: Proceedings of the XI International Conference Students Scientific Circle (Section of Veterinary), 89, 2006. In Polish.

WESSELY-SZPONDER J.: The influence of THF- α on nitric oxide production by neutrophils derived from heifers with bovine respiratory disease.

Publication: Proceedings of the IX International Conference: „The science and technologies: a step in the future”, Dniepropetrovsk, 11–15, 2006. In English.

WESSELY-SZPONDER J., BOBOWIEC R.: The influence of IL-8 on nitric oxide generation by neutrophils isolated from heifers in the course of acute and chronic bovine respiratory disease (BRD).

Ref.: XXIII Congress of the Polish Physiological Society „Physiology without limits”, Warsaw, 14–16 IX 2006.

Publication: J. Physiol. Pharmacol, 57, suppl. 2, 239, 2006. In English.

OTHER PUBLICATION

WESSELY-SZPONDER J., BOBOWIEC R.: The pathogenesis and treatment of bovine respiratory disease. (Patogeneza i leczenie zespołu oddechowego u bydła).

Publication: Magazyn Wet. 15, 113, 48–51, 2006. In Polish, summary in Polish.

SUB-DEPARTMENT OF PHARMACOLOGY

12 Akademicka, Lublin

Head: Prof. Dr. habil. Cezary Kowalski

RESEARCH STUDIES (SUMMARIES)

Cezary Kowalski, Małgorzata Pomorska

EVALUATION OF BIOEQUIVALENCE OF TWO TYLOSIN FORMULATIONS AFTER ORAL ADMINISTRATION IN BROILER CHICKENS

Ocena biorównoważności pomiędzy dwoma preparatami tylozyny
po podaniu doustnym u kurcząt rzeźnych

Tylosin, a drug mainly used in veterinary medicine, belongs to the macrolide group of antibiotics. In this study the bioequivalence and differences in pharmacokinetics of solution and powdered tylosin formulations were established. The following recommended by EMEA parameters: C_{max} , T_{max} , AUC were determined. All the investigations were carried out in the populations of 74 broilers chickens. The concentration of tylosin in plasma was determined by means of the appropriately modified HPLC method. The mean maximum concentration (C_{max}) of tylosin in plasma was found to occur 3.0 h (for powder and liquid) after oral administration. They were 403.20 ng/ml and 403.12 ng/ml respectively. The plasma profiles of tylosin following administration of both formulations were similar.

Publication: Annales UMCS (Lublin), sectio DD, 61, 25–29, 2006, fig. 1, tab. 2. In Polish, summary in English.

Cezary Kowalski, Małgorzata Pomorska, Bronisław K. Głód, Anna Konior

**TOTAL ANTIOXIDANT POTENTIAL MEASUREMENT
USING IMPROVED FLUOROMETRIC ASSAY**

Zastosowanie metody fluorometrycznej do oszacowania całkowitego potencjału antyoksydacyjnego

Total Antioxidant Potential (TAP) is frequently more efficient to describe the antioxidant properties of the complex biological samples (such as herbal extracts or blood plasma) than concentrations of all individual antioxidants in the sample. In the paper improved fluorometric assays of the TAP measurements were described. This test adopts thermolabile diazocompound (2,2'-diazobis(2-amidinopropane) dihydrochloride – AAPH) generating peroxy radical, Fenton reaction produced hydroxyl radicals and SIN-1 (3-morpholino-sydnonimine) generating peroxynitrite. These radicals oxidize the analyzed samples and so called „detector”. A sample competes with the reaction between detector and radical, therefore it delays this reaction. Results are calculated from the delay time during which antioxidants are consumed. Assays related to different radicals are described and compared. They will be tested measuring antioxidant potentials of different herbs extracts and alcohol compounds.

Publication: Annales UMCS (Lublin), sectio DD, 61, 55–59, 2006, fig. 2. In Polish, summary in English.

Cezary Kowalski, Małgorzata Pomorska, Tomasz Sławik

**DEVELOPMENT OF HPLC WITH UV-VIS DETECTION
FOR OXYTETRACYCLINE LEVEL DETERMINATION IN THE BIOLOGICAL MATRIX**

An isocratic reversed phase high performance liquid chromatographic procedure was developed for determination of oxytetracycline in the biological matrix. The procedure is based on isolation of the compound and the standard (oxytetracycline hydrochloride) from pig plasma using the Shimadzu C18 (500 mg) cartridge with satisfactory recovery (92.50%) and specificity on a Varian ChromSep HPLC OmniSpher C18 (250 × 4.6 mm, 5 μm) column coupled with a UV-VIS detector set at 360 nm. The suggested technique was shown to be linear ($R^2 = 0.9999$) over the concentration range 25–500 ng/mL. These results clearly demonstrate that the HPLC method is a useful tool in many applications, particularly in veterinary medicine studies.

Publication: J. Liq. Chromatogr. & Related Technol., 29, 2721–2731, 2006, fig. 5, tab. 1, In English, summary in English.

Rafał Zań, Cezary Kowalski, Artur Burmańczuk

**VALIDATION METHOD FOR DETERMINATION OF 8- α - HYDROXYMUTILIN
IN BIOLOGICAL MATERIAL**

Walidacja metody oznaczania 8- α -hydroksymutyliny w materiale biologicznym

Validation method is a key element in both elaboration of reference methods and assessment of laboratory competence in producing reliable analytical data.

The aim of the study was to validate the GC method (according to Marcus and Sherma) used in determining 8- α - hydroxymutilin in a biological matrix (swine tissues – liver and muscles). The basic parameters for validation, including accuracy, precision, selectivity, sensitivity reproductibility and stability were estimated.

The studies confirmed the usefulness of the GC method to determine tiamulin residues in swine tissues.

Publication: Medycyna Wet. (Lublin) 62, 797–800, 2006. fig. 6, tab. 3. In Polish, summary in English.

Rafał Zań, Cezary Kowalski, Zbigniew Roliński, Artur Burmańczuk

**THE ELIMINATION RATE 8- α -HYDROXYMUTILIN,
RESIDUE MARKER OF TIAMULIN IN PIGS**

Tempo eliminacji 8- α -hydroksymutyliny, markera pozostałości tiamuliny u świń

Tiamulin, a semi-synthetic antibiotic agent, is used solely in veterinary medicine. This antibiotic is rapidly distributed in the body and intensively metabolized in the liver. The aim of this study was to estimate the residue levels of tiamulin metabolite in pigs tissues after oral and intramuscular administration.

The experiment was carried out on 38 PL breed weaners, divided into two groups. One of them was administered Tiamowet 45% granulate orally in a dose of 24 mg/kg b.w./day and the other one Tiamowet 200 intramuscularly 15 mg/kg b.w./day. The drugs were given for 5 days. The weaners from both groups were sacrificed after 3, 4, 6, 8, 10, 12 and 15 days from the end of drugs administration. The samples of the tested tissues from livers and muscles were isolated for measurement of the residue marker level. 8- α -hydroxymutilin residues were estimated according to GC method by Marcus and Sherma in the present author's own modification. The validation method procedure was carried out. The

GC experiment showed that 8- α - hydroxymutilin concentration in the tested muscles reaches the lower level than that given by MRL which means 100 $\mu\text{g}/\text{kg}$ on 10 day after intramuscular Tiamowet 200 preparation administration and on 12 day after oral Tiamowet 45% granulate administration.

Publication: Medycyna Wet. (Lublin) 62, 448–451, 2006. fig. 3, tab. 2. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

KOWALSKI C., POMORSKA M., ŁEBKOWSKA B., SŁAWIK T.: Determination of OTC in biological matrices.

Ref. V Multidisciplinary Conference on Drug Research (MKNOL¹ 2006) Darłówo Wsch. 15–17 V 2006.

Publication: Book of Abstracts: The V Multidisciplinary Conference on Drug Research (MKNOL¹ 2006). 57, 2006. In English.

KOWALSKI C., ŁEBKOWSKA B., POMORSKA M., GŁÓD B.K.: Probiotics – as an alternative for antibiotics?

Ref. V Multidisciplinary Conference on Drug Research (MKNOL¹ 2006) Darłówo Wsch. 15–17 V 2006.

Publication: Book of Abstracts: The V Multidisciplinary Conference on Drug Research (MKNOL¹ 2006). 57–58, 2006. In English.

KOWALSKI C., POMORSKA M., ŁEBKOWSKA B., BORZĘCKI A.: Residues of sulphadiazine and trimetoprim in edible weaners' tissues. (Pozostałości sulfadiazyny oraz trimetoprimu w jadalnych tkankach warchlaków).

Ref. III Scientific Conference „Immunomodulation and immunotoxicology” Jurata 2–3 VI 2006.

Publication: Materials of III Scientific Conference „Immunomodulation and immunotoxicology”, 36–37, 2006. In Polish.

KOWALSKI C., BURMAŃCZUK A., ZAŃ R.: Determination of Cefacetril pharmacokinetics after intramammary supplementation in mastitis and physiological state in cows. (Określenie farmakokinetyki cefacetrilu po dowymieniowym stosowaniu w stanach zapalnych i fizjologicznych gruczołu mlekowego u krów).

Ref. III Scientific Conference „Immunomodulation and immunotoxicology”. Jurata 2–3 VI 2006.

Publication: Materials of III Scientific Conference „Immunomodulation and immunotoxicology. 34–35, 2006. In Polish.

KOWALSKI C., POMORSKA M., ŁEBKOWSKA B.: Determination of tylosin concentration in plasma using HPLC. (Oznaczanie stężenia tylozyny w osoczu z wykorzystaniem techniki HPLC.)

- Ref. Science Symposium „Modern research technics in evaluation of medicinal products qualits administration”, Lublin, 21–22 IX 2006.
Publication: Proceedings of the Scientific Symposium: „Modern research technics in evaluation of medicinal products qualits administration”, 67–68, 2006. In Polish.
- KOWALSKI C., POMORSKA M., ŁEBKOWSKA B.: Determination of erythromycin in plasma after therapeutic doses. (Oznaczanie erytromycyny w osoczu po jej zastosowaniu w dawkach terapeutycznych).
 Ref. Science Symposium „Modern research technics in evaluation of medicinal products qualits administration”, Lublin, 21–22 IX 2006 r.
Publication: Proceedings of the Scientific Symposium: Modern research technics in evaluation of medicinal products qualits administration”, 65–66, 2006. In Polish.
- KOWALSKI C., ŁEBKOWSKA B., POMORSKA M., KLIMONT E.: Intravenous infusions and injections functions and practical application in farm animals and pets animals. Part I. (Wlewy i iniekcje dożylnie – ich funkcje i zastosowanie u dużych i małych zwierząt. Część I).
 Ref. VII Conference of Veterinarians, Serock 30 IX 2006.
Publication: Materials of VII Scientific Conference of Veterinarians, 13–26, 2006. In Polish.
- KOWALSKI C., ŁEBKOWSKA B., POMORSKA M., KLIMONT E.: Intravenous infusions and injections functions and practical application in farm animals and pets animals. Part. II. (Wlewy i iniekcje dożylnie – ich funkcje i zastosowanie u dużych i małych zwierząt. Część II).
 Ref. VII Conference of Veterinarians, Serock 30 IX 2006.
Publication: Materials of VII Scientific Conference of Veterinarians, 27–34, 2006. In Polish.
- POMORSKA M.: Determination and comparison of basic pharmacokinetics parameters after oral administration of tiamulin in broiler chickens. (Wyznaczenie oraz porównanie podstawowych wskaźników farmakokinetycznych tiamuliny po podaniu doustnym u kurcząt rzeźnych).
 Ref. IV Conference of PhD students „Problems of plants, animals and ford technology”, Lublin 6–7 IV 2006.
Publication: Materials of IV Conference of PhD students: Problems of plants, animals and ford technology”. 75–77, 2006. In Polish.
- ZAŃ R., BURMAŃCZUK A., ROLIŃSKI Z.: Chromatographic (GC) determination of tiamulin residue marker in biological material. (Chromatograficzne GC oznaczenie markera pozostałości tiamuliny w materiale biologicznym).
 Ref. III Scientific Conference „Immunomodulation and immunotoxicology” Jurata 2–3 VI 2006.
Publication: Materials of III Scientific Conference „Immunomodulation and immunotoxicology”, 84–85, 2006. In Polish.

ZAŃ R., KOWALSKI C., BURMAŃCZUK A., KLIMONT E., POLSKA B.: Validation method for determination of tiamulin residue marker in animal tissues. (Walidacja metody oznaczania markera pozostałości tiamuliny w tkankach zwierząt).
Ref. Science Symposium „Modern research technics in evaluation of medicinal products qualits administration”, Lublin, 21–22 IX 2006.
Publication: Proceedings of the Scientific Symposium: „Modern research technics in evaluation of medicinal products qualits administration”, 146–148, 2006. In Polish.

OTHER PUBLICATIONS

KOWALSKI C., ŁEBKOWSKA B., POMORSKA M.: Probiotics as a potential alternative for antibiotics therapy. (Probiotyki – potencjalna alternatywa dla terapii antybiotykowej).
Publication: Magazyn Wet., Supl. Świnie, 62–66, 2006. In Polish.

KOWALSKI C., POMORSKA M., ŁEBKOWSKA B.: Chemiotherapy of the urinary system bacterial infections in cats and dogs. (Chemioterapia zakażeń bakteryjnych układu moczowego u psów i kotów).
Publication: Magazyn Wet., 15, 64–69, 2006. In Polish.

KOWALSKI C., ŁEBKOWSKA B., POMORSKA M.: Problems with controlling bacterial infections in farm fish. (Problemy zwalczania infekcji bakteryjnych u ryb hodowlanych).
Publication: Komunikaty Rybackie, 6, 11–16, 2006. In Polish.

KOWALSKI C., POMORSKA M., ŁEBKOWSKA B.: Immunotoxic properities of the pesticides. [In:] Natural and synthetic modulators of immunological response and angiogenesis, Ed. by A.K. Siwicki i E. Skopińska-Różewska. (Immunotoksyczne właściwości pestycydów. [W:] Naturalne i syntetyczne modulatory odpowiedzi immunologicznej i angiogenezy).
Publication: Preparation Studio of Publications „Edycja” Olsztyn, 211–228, 2006. In Polish.

SUB-DEPARTMENT OF VETERINARY TOXICOLOGY AND ENVIRONMENT PROTECTION

12 Akademicka, Lublin

Head: Dr. habil. Wojciech Cybulski
Dr. habil. Grażyna Wałkuska

RESEARCH STUDIES (SUMMARIES)

Wojciech Cybulski, Joanna Wessely-Szponder, Lidia Radko,
Ryszard Bobowiec, Andrzej Wernicki

INFLUENCE OF MONENZIN ON SECRETION AND VIABILITY OF NEUTROPHILES ISOLATED FROM BRD INFECTED HEIFERS

Wpływ monenzyny na żywotność i aktywność izolowanych neutrofilów od jałówek
w przebiegu zespołu oddechowego (BRD)

Bovine respiratory disease (BRD) outbreaks are common in heifer herds. Monenzin, a feed additive, is often used in order to improve rumen digestion. The impact of this antibiotic on neutrophil phagocytes and the secretion of its granule contents have been reported in several species, although not in cattle. The presented study focused on the secretor and viability traits of neutrophils from healthy heifer blood ($n = 4$) and BRD heifers ($n = 6$). Isolated cells were subjected to monenzin (1–50 mM) within a 24 hr incubation period. Elastase, myeloperoxidase and alkaline phosphates activities as well as ROS, NO and cell viability assessment were carried out using MTT tests in incubation media. Neutrophils of BRD heifers displayed a significantly higher granular enzyme release and lowered vitality than in the healthy animals. Increased concentrations of monenzin inhibited secretions of NO both in healthy and BRD heifers, yet did not influence O_2^- levels. Monenzin at 1 mM stimulated ALP activity, but higher concentrations of the substance suppressed their release. Elastase output grew in relation to increasing amounts of the antibiotic. Cell viability was significantly affected by higher concentrations of monenzin. The obtained *in vivo* results sug-

gest that heifers fed monensin-containing diets may show neutrophil-augmented reactions and, as a result, the course of BRD may become more severe.

Publication: Medycyna Wet. (Lublin) 63, 951–954, 2006, fig. 3, tab. 1. In Polish, summary in English.

Lidia Radko, Wojciech Cybulski, Joanna Wessely-Szponder, Wojciech Rzeski

STUDIES ON CYTOTOXICITY OF MONENSIN AND NARASIN IN RAT HEPATOCYTE CELL LINE CULTURE

Badania cytotoksyczności monensyny i narasyny w hodowli linii ciągłej hepatocytów szczura

The aim of the work was to determine monensin, narasin hepatotoxicity and nature of cell death. Rat hepatocyte model cell line (FAO) was used to investigate two ionophore antibiotics cytotoxic effects estimated by MTT, NRU and KB tests approved by Invitox. Additional apoptotic/ necrotic nature of cell death was searched by propidium iodide and HO 342 staining of the cultured hepatocytes. IC₅₀ indices for monensin and narasin estimated by MTT test during 24 hour incubation were established at level $0,027 \pm 0,001 \mu\text{M}$ and $0,037 \pm 0,001 \mu\text{M}$, respectively. However incubation for 48 h yielded equal value, $0,02 \mu\text{M}$, for both ionophores. Contrary to MTT test, NRU and KB estimations showed lower IC₅₀ values for narasin than to monensin. These results correlated to in vivo acute toxicity, LD₅₀ indices in rats (data from references). Apoptotic nature of hepatocytes death in the cultures were dominating. Mechanisms of ionophore induced cytotoxicity are discussed.

Publication: Medycyna Wet. (Lublin) 62, 834–837, 2006, fig. 3. In Polish, summary in English.

Grażyna Wałkuska, Jerzy L. Gundlach, Andrzej B. Sadzikowski,
Maria B. Studzińska, Agnieszka Chałabis-Mazurek, Krzysztof Tomczuk

THE CONTENT OF Cd, Cr, Cu, Mn, Ni AND Pb IN SELECTED PARASITES AND THEIR HOSTS – AQUATIC BIRDS

Zawartość Cd, Cr, Cu, Mn, Ni i Pb w wybranych pasożytach i tkankach ich żywicieli – ptaków wodnych

The aim of this study was to determine the content of selected elements in parasites and tissues of their hosts – aquatic birds from the Lublin area. The content of Cd and Cu in the examined tapeworms and thorny-headed worms was

comparable. However, the content of Cr and Mn was lower in tapeworms and thorny-headed worms in contrast to the content of Ni and Pb. A comparison of the content of the examined elements in tapeworms and thorny-headed worms and their hosts showed a significantly higher level of Cr and Mn in parasites than in their hosts. The results concerning Pb were not clear. There were found significant differences in the content of the examined elements in tissues of individual species of birds and between representatives of the same species related to the housing in different environmental conditions and birds movement.

Publication: Annales UMCS, (Lublin), sectio DD, 61, 119–125, 2006. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

CYBULSKI W., RADKO L.: Pathophysiological mechanisms of ionophore antibiotics action on rats hepatocyte and myocyte cell lines.

Ref. XXIIIth Congress of Polish Scientific Society Physiology: „Physiology without barrier”. Warsaw, 15–16 IX 2006.

Publication: Materials of the XXIIIth Congress of Polish Scientific Society Physiology: „Physiology without barrier”. Warsaw, 130, 2006. In English.

CYBULSKI W., RADKO L.: The sylimarin useful and safety phytotherapeutic agent in veterinary. (Sylimaryna przydatnym i bezpiecznym fitofarmaceutykiem w weterynarii).

Ref. Scientific Conference: „Present-day phytotherapy – adverse action and interaction”, Poznań, 7 XI 2006.

Publication: Herba Polonica, 52, 3, 120–121, 2006. In Polish.

RADKO L., CYBULSKI W., RZESKI W.: Applicability of alternative methods in assessment of cytotoxicity silybin. (Zastosowanie alternatywnych metod *in vitro* do oceny cytotoxyczności silybiny).

Ref. Scientific Symposium: High Technique in Assessment of Quality of Therapeutic Products. Lublin, 21–22 IX 2006.

Publication: Materials of the Scientific Symposium: „High technique in assessment of quality of therapeutic products. Lublin, 94–95, 2006. In Polish.

RADKO L., CYBULSKI W., RZESKI W.: Protective and toxic effect of the silybin on rats, chicken and human hepatocytes cell lines (Ochronne i toksyczne działanie silybiny na hepatocyty linii komórkowych szczura, kurcząt i człowieka).

Ref. XXIIIth Congress of Polish Scientific Society Physiology: “Physiology without barrier”. Warsaw, 15–16 IX 2006.

Publication: Materials of the XXIIIth Congress of Polish Scientific Society Physiology: „Physiology without barrier”. Warsaw, 216, 2006. In English.

RADKO L., CYBULSKI W., RZESKI W.: Cytoprotection action of sylimarin to toxic effect of thiuram on hepatocyte human hepatocytes cell lines. (Cytoprotekcyjny wpływ sylimaryny na hepatocyty linii ciągłej człowieka wobec toksycznego działania thiuramu). Ref. Scientific Conference: „Present-day phytotherapy – adverse action and interaction”, Poznań, 7 XI 2006.

Publication: Herba Polonica, 52, 3, 117–118, 2006. In Polish

RADKO L., CYBULSKI W., RZESKI W.: Cytoprotection action of sylimarin to toxic effect of antibiotics ionophore *in vitro* study. (Cytoprotekcyjny wpływ sylimaryny wobec toksycznego działania wybranych antybiotyków jonoforowych w badaniach *in vitro*).

Ref. Scientific Conference: „Present-day phytotherapy – adverse action and interaction”, Poznań, 7 XI 2006.

Publication: Herba Polonica, 52, 3, 124–125, 2006. In Polish.

RADKO L.: Study of protection action sylimarin on toxicity of ionophore antibiotics. (Badania protekcyjnego wpływu sylimaryny wobec toksycznego działania wybranych antybiotyków jonoforowych).

Ref. IVth Scientific Conference of Doctorates Agricultural University of Lublin: „Problems in technology of vegetable, animal and foods production. Lublin, 6–7 IV 2006.

Publication: Materials of the IVth Scientific Conference of Doctorates Agricultural University of Lublin: „Problems in technology of vegetable, animal and foods production”. Lublin, 78–79, 2006, In Polish.

OTHER PUBLICATIONS

CYBULSKI W., RADKO L.: Pharmaceuticals of β -agonist group; pharmacological, toxicological, hygienic and legislative aspects. (Środki farmaceutyczne z grupy β -agonistów – aspekty farmakologiczne, toksykologiczno-higieniczne i legislacyjne).

Publication: Życie Wet. 81, 760–766, 2006. In Polish.

INDEX OF AUTHORS

Lublin vol. 45

- Adaszek Ł. **82**, 87, 88
Albera E. 62, 65, **65**
Arciszewski M. 18
Aurich C. 64, 66, 63
Aurich J.E. 63, 66
Badzian B. **39**, **40**
Balicki I. **76**, **78**, **79**
Barszcz P. 88
Bergero D. 63, 65
Biegała P. 23
Bielawski A. 78
Bielecka G. **41**
Bieńko M. **42**, 43, 44, 46, 48, **55**, 56, 57
Biernat M. 58
Bis-Wencel H. **93**
Bizoń K. 85, 86, 87
Blimke Z. 72
Bobowiec R. **97**, 98, 99, 100, 101, 102, 104, 111
Boratyński Z. 30, 31, 33, 35
Boruch W. **102**
Borzęcki A. 108
Brodzki A. 52, 78
Buczek J. 18
Buoncristiani P. 103
Burdan F. 35
Burmańczuk A. 107, 108, 109, 110
Cerri D. 98
Chałabis-Mazurek A. 112
Chelmiński M. 85, 87, 88
Ciechanek R. 35
Cybulska R. 37, **38**
Cybulski W. **111**, 112, **113**, 113, 114, **114**
Ćwiok E. **102**
Daniłoś J. 66
Dąbek M. 58
Dąbrowska A. 35
Dąbrowski R. 75
Dec M. **29**
Dębiak P. 81, 82
Dmowska M. 38
Dobrowolski P. 48, 58
Ducci M. 97, **98**, 101, **103**
Dudek K. **42**
Dudka J. 35
Dziduszko A. 87
Dziedzic R. 18
Erlwanger K. 51
Eustachiewicz R. 34
Evilevitch L. 51
Fałkowska-Podstawka M. **99**
Filar J. 101
Filip R.S. 42, **43**, 46, 48, 56, 57
Gadea J. 98
Gajewski Z. 47, 55, 57, 59
Gawron A. 56
Gazzano A. 98
Gliński Z. **88**
Głód B.K. 106, 108
Godlewski M. 58
Gołyński M. **67**, 69, 72, 73
Grądzki Z. **83**, 87
Gregory P.C. 56
Grela E.R. 60
Gundlach J.L. **14**, 112
Guz L. **12**, **13**
Haratym-Maj A. 43
Harrison A.P. 53
Hetman E. 83
Jarosz Ł. 55, 72
Jasik A. **94**
Jaworska-Adamu J. 31, 36, 38
Kankofer M. 18, 27, **61**, **62**, 63, 64, **65**, 65, 66
Kapica M. 42, **44**, **45**, 46, 47, 48, 53, **55**, 56, 57, 59
Kazimierzczak W. 48, 57
Kędzierski W. **62**, **63**, 65
Klebaniuk R. 60
Klimont E. 109, 110
Kolasa A. 16, **17**, 17
Komsta R. **80**, **81**
Konior A. **106**
Kopczewski A. 93
Korol W. 41

Kosior-Korzecka U. 97, **100**, 101, 103, **103**
 Kostro K. **83**, **84**, 84, 85, 88
 Kostruba A. 22
 Kot K. **103**
 Kotarski J. 66
 Kovalik M. 69, 73
 Kowalska M. **24**
 Kowalski C. **105**, **106**, 107, **108**, **109**,
 110, **110**
 Kozaczyński W. 94
 Krakowska I. 31, **31**, **35**
 Krakowski L. 83
 Krakowski M. 83, **84**, **85**
 Krawczyk C.H. 62
 Krukowski H. **77**
 Krupski W. 52, **55**, **56**, 58, 59
 Kruszewska D. 56
 Kulasek G. 47, 57, 59
 Kurek Ł. 68, 71
 Kusy R. **74**, 75
 Kutrzuba J. 82, 88
 Kwiecień M. 44
 Larsson L. 68
 Laubitz D. 44, 54, 55, 59
 Lennernäs H. 51
 Leśniewska K. 84
 Libelt K. 90
 Lipecka Cz. 100
 Lipiński P. 57
 Lipko J. 61, 62, 65
 Lisiak B. 81
 Lisowski A. 65, 77
 Listos P. **94**, 95
 Lonc G. 34
 Lubańska A. 44
 Luft-Deptuła D. 86, 87, 88
 Lutnicki K. **36**
 Łebkowska B. 108, 109, 110
 Łopucka D. 72
 Łopucki M. **66**
 Łopuszyński W. 28, 77, 94
 Łuszczewska-Sierakowska I. **32**, **33**, 34, 35
 Maciejewski R. 35
 Madany J. **67**, **71**, 71, 84, 87
 Madej B. **35**, 35
 Madsen A.M. 68
 Majcher P. 55, 56
 Majer-Dziedzic B. **18**, 84
 Malec H. 81
 Marczuk J. **100**
 Martelli F. 97, 98, **103**
 Martensson L. 68
 Matras J. 60
 Matysek M. 31
 Michałowski P. 54
 Mikucki P. **25**, 27, 28
 Mochol J. 68, **71**, 71
 Mosenthin R. 56
 Müller-Schlösser F. 63, 66
 Niccoloni A. 98
 Nowak M. 72
 Nowakiewicz A. 19, 22, 23
 Nowakowski H. 50, 67, 69, **71**, 101
 Nozdryn-Plotnicki Z. 93, 94, 95
 Orzelski M. 77, 78
 Pacchini S. 98
 Pagl R. **63**, **64**, **66**
 Panasiuk L. 43
 Pasternak K. 52
 Paszkiewicz W. **91**
 Paško S. 67
 Pawelec J. 37
 Pawłowska M. 42,44, 45, **46**, 47, 53, 54,
56, 57, 58, 59
 Pedrycz A. 30, 31, **33**
 Pełczyńska E. 91
 Pepiak A. 67
 Piersiak T. 38, 46, 58
 Pierzynowski S.G. 50, 51, **56**, 56, 58, 59
 Pietruszewski S. 66
 Pijarska I. 89
 Piórkowski J. 77, **95**
 Pisarski R.K. **89**, 91
 Pliszczyński M. **85**, **86**, **87**
 Podolak M. **65**
 Polkowska I. 77, **77**, 78
 Popiel J. 69, 72
 Polska B. 110
 Pomorska D. 67, 68, 69, 72
 Pomorska M. 105, 106, 108, 109, **109**, 110

Pomorski Z. 72
 Poznański P. 35
 Prażmo W. 35
 Prost E.K. **91, 92**
 Puchalski A. 25, 26, 27, 28, 29
 Puzio I. 41, 42, 43, 44, 45, 46, **46, 47, 48,**
 53, 55, 56, **57, 59**
 Pyz-Łukasik R. 90
 Radko L. 111, **112, 113, 113, 114, 114**
 Radzikowska E. 35, **35**
 Radzki R.P. 42, 43, 44, 46, **48, 55, 57**
 Rogowska W. 66
 Roliński Z. 107, 109
 Różański P. 77
 Rzedzicki J. 16, 17, **17**
 Rzeski W. 99, 112, 113, 114
 Saba L. 93
 Sadzikowski A.B. 14, **14, 15, 112**
 Saletra G. **103**
 Sawa-Wojtanowicz B. 53
 Schoenborn R. 38
 Sebastian A. **68**
 Sighieri C. 98
 Sileikiene V. 56
 Silmanowicz P. 77, **79**
 Skowron M. **16, 17, 17, 82**
 Skrzypczak M. 87
 Skrzypek H. 48, 56, 57, 58
 Skrzypek T. **48, 54, 56, 57, 58**
 Sławik T. 106, 108
 Sobczyńska-Rak A. 77
 Sroka A. 93
 Sroka J. 24
 Stachowicz N. 66
 Starzyński R.R. 57
 Stec A. **68, 71, 71**
 Strumiło S. 22
 Studzińska M.B. 14, 112
 Studziński T. 50, 56, 58, 59, **60, 60**
 Szalák R. **34**
 Szczepaniak K. 56
 Szczepaniak M. 67, **69, 72, 72, 73**
 Szczubiał M. **75**
 Szkucik K. 89, **90, 91**
 Szponder T. **78**
 Szpringer E. 36
 Szymańczyk S.E. 56, 57, **58, 59, 54**
 Szymańczyk-Kwapik S.E. 45, 46, 53
 Śliwa E. 42, **49, 50, 52, 58, 58, 59, 60**
 Śmiech A. 69, 72
 Tannergren C. **51**
 Taszkun I. 69, 72, **72**
 Tatar M.R. 42, 50, 51, **52, 53, 55, 56, 58,**
 58, 59, 60, 60
 Tokarzewski S. **18, 20, 21, 22, 23, 27**
 Tomczuk K. **14, 112**
 Trbolova A. 79
 Truchliński J. 60
 Tusińska E. 96
 Twardowski P. **81, 81**
 Tygesen M.P. 53
 Tylicki A. 22
 Urban-Chmiel R. 18, **25, 25, 26, 27, 28, 29,**
 29, 62, 65,
 Valvedre-Piedra J.L. 45, 46, 47, 48, 51, **53,**
 54, 55, 56, 57, 58, 59, 59, 60
 Visconti J. 33
 Wałkuska G. **112**
 Wawron W. 74, 75
 Wawrzyniak-Gacek A. **37**
 Wernicki A. 18, 25, 26, **27, 28, 29, 29, 111**
 Weselly-Szponder J. **104, 111, 112**
 Weström B. 51, 56
 Wilczak J. 47, 55, 59
 Wilkołek P. 67, 69, **70, 72, 72, 73**
 Winiarczyk S. 82, 83, **87, 88**
 Właż P. 38
 Wojcicka-Lorenowicz K. 83, 84
 Woliński J. 48, 54, 59
 Wójcik M. **102, 103**
 Wróbel J. 36
 Zabielska M. **59, 55**
 Zabielski R. 44, 47, 48, 54, 55, 56, 57, 58, **59**
 Zań R. 103, **107, 108, 109, 110**
 Zietek A. 83
 Ziętek E. 23
 Ziętek J. 18, **23**
 Ziółkowska G. **19, 20, 21, 22, 23**
 Zoń A. 93