

EXCERPTA
VETERINARIA
LUBLIN

Vol. 47 (2008) UNIVERSITY OF LIFE SCIENCES IN LUBLIN 2009

PUBLISHED ANNUALLY
BY
THE FACULTY OF VETERINARY MEDICINE

Editor
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ISSN 2080-914X

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Project of cover
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WYDAWNICTWO UNIwersytetu PRZYRODNICZEGO W LUBLINIE

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Preface

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

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

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

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FACULTY OF VETERINARY MEDICINE LUBLIN 2008

Structure

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

Staff of Faculty

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

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

Vice-Dean: Prof. extraordin. Dr. habil. Cezary Kowalski
Prof. extraordin. Dr. habil. Piotr Silmanowicz

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Dr. habil. Zygmunt Nowakowski
Dr. habil. Iwona Puzio
Dr. habil. Marek Szczubiał
Dr. habil. Renata Urban-Chmiel
Dr.habil. Jose Luis Valvedre Piedra
Dr. habil. Grażyna Wałkuska

Assistants, adjuncts and lecturers: 81

Technicians: 56

Received the degree of Doctor of Veterinary Science: 10

Received the degree of Doctor habil.: 2

Students: 1058

Received the diploma of veterinary surgeon: 154

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
<hr/>	
Total	315 hours

Altogether didactic hours

General specific and professional subject	3885 hours
Optional subject	150 hours
Clinical practices	315 hours
<hr/>	
Total	4350 hours

Professional trainings

After the 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 2008)

INSTITUTE OF BIOLOGICAL RUDIMENTS OF ANIMAL DISEASES

30 Głęboka, Lublin

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

SUB-DEPARTMENT OF FISH DISEASES AND BIOLOGY

Akademicka 12, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Leszek Guz, Antonina Sopińska

INFLUENCE OF TEMPERATURE ON GROWTH, PROTEASE PRODUCTION, AND HEAT RESISTANCE OF AEROMONAS HYDROPHILA (HG-1), *A. bestiarum* (HG-2) AND *A. salmonicida* (HG-3)

The aim of the study was to evaluate the effect of different temperatures on caseinase and elastase production and growth of *Aeromonas hydrophila* K-101, *A. bestiarum* 15s, and *A. salmonicida* A-11 strains, isolated from diseased carp. In order to study the influence of the temperature on proteolytic yield and growth of the strains, standard spectrophotometric methods were used. For the determination of caseinase and elastase activity, the azocasein and elastin-Congo red as substrates were used. It was shown that K-101, 15s, and A-11 strains isolated from motile *Aeromonas* septicaemia (MAS) affected carp growth better at 28°C than at 18 and 38°C. The highest proteolytic activity of all studied strains was obtained when the bacteria were grown at 28°C. At 60°C the *D*-value for K-

101, 15s, and A-11 were 7, 4, and 3, respectively. Summing up, the temperature influenced the growth of the strains isolated from MAS affected carp. The adaptation of these strains to environmental factors imply their possible long survival in the water, which is a potential threat to public and animal health. From these results it can be concluded that the potential virulent ability of the ECP might vary due to culturing at different incubation temperatures.

Publication: Bull. Vet. Inst. Pulawy 52, 45-52, 2008, fig. 4, tab. 1. In English, summary in English.

**SUB-DEPARTMENT OF PARASITOLOGY
AND INVASIVE DISEASES**

Akademicka 12, Lublin

Head: Prof. Dr. habil. Andrzej Bernard Sadzikowski

**RESEARCH STUDIES
(SUMMARIES)**

Andrzej B. Sadzikowski., Klaudiusz O. Szczepaniak

LIVER COCCIDIOSIS IN LIZARDS

Kokcydioza wątroby u jaszczurek

In three lizards coccidian invasions from genus *Choleoeimeria* were reported. The oocysts were cylindrical, $24,3 \times 15,0 \mu\text{m}$, tetrasporocystic, sporocyst residuum present, without micropyle and Stieda body. Shape index (length : width ratio) – 1,62. Oocysts were found in gall blader.

Publication: Essentia Vet. 1, 38–42, 2008, fig. 6, tab. 3. In Polish, summary in English.

Andrzej B. Sadzikowski, Krzysztof Szkucik, Klaudiusz O. Szczepaniak,
Waldemar Paszkiewicz

PREVALENCE OF PROTOZOON GENUS *EIMERIA* IN SLAUGHTER RABBITS

Występowanie pierwotniaków z rodzaju *Eimeria*
u królików rzeźnych pochodzących z różnych hodowli

Intestines and livers of 167 slaughter rabbits from south-eastern Poland were investigated in 2007. 124 rabbits (slaughtered at three different times) came from small farms and 43 from an industrial rabbit farm. Protozoon from genus

Eimeria was recognized in 160 rabbits (94.80%), but only in some of them gross pathological lesions in the intestines or liver were found. Intestinal coccidia were found, depending on the group, in 86–96% of rabbits while liver coccidia in 25–60%. A total number of 9 species of *Eimeria* spp. was found. Among intestinal coccidia the most prevalent were *E. piriformis*, *E. media*, *E. perforans*, *E. intestinalis*, *E. magna*; *Eimeria stiedai* were common also (located in the liver). The extensiveness of invasion by individual species was different for the investigated groups. The intensity of invasion was the lowest in rabbits from the industrial farm, which suggested that prophylactic procedures had been in place. The analysis of Veterinary Inspection reports (RRW-6) showed that during the last 10 years rabbit coccidiosis has been responsible for a great part of lesions diagnosed in slaughter houses, however it has rarely caused rabbit carcasses to be declared unfit for human consumption.

Publication: Medycyna Wet. (Lublin) 64, 1361–1440, 2008, fig. 5, tab. 5. In Polish, summary in English

Maria B. Studzińska, Krzysztof Tomczuk, Andrzej B. Sadzikowski

PREVALENCE OF *Eimeria leuckarti* IN YOUNG HORSES AND USEFULNESS OF SOME COPROSCOPICAL METHODS FOR ITS DETECTION

Two hundred and seven horses, weaned foals aged 6 to 12 months from small farms in the Lublin region were examined in the years 2005 to 2007. The investigations were carried out using flotation, sedimentary flotation methods, and McMaster's quantitative method modified by Wetzel. *Eimeria leuckarti* oocysts were found in 19 (9.18%) out of the 207 foals. The horses infected by *Eimeria leuckarti* occasionally demonstrated clinical signs (4 horses) and only 2 foals suffered a terminal diarrhoea. The number of oocysts excreted *via* faeces was generally low and their presence in the faeces was detected irregularly. The sedimentary flotation method was the most effective considering the identification of *E. leuckarti* invasion.

Publication: Bull. Vet. Inst. Pulawy 52, 541-544, 2008, fig. 1, tab. 2. In English, summary in English.

Klaudiusz O. Szczepaniak, Anna Łojarczyk-Szczepaniak

ULCERATIVE SHELL DISEASE OF TORTOISES

Choroba wrzodowa pancerza żółwi

The aim of this paper was to present a case of severe skin disease in turtle. In semi-aquatic freshwater female tortoise *Trachemys scripta elegans* with shell erosions and lesions, the ulcerative shell disease, USD, was recognized. It may have led to development of the secondary pneumonia. Furthermore, the USG examination of celomic cavity showed high-abundance of fluid. USD and related SCUD – septicemic cutaneous ulcerative disease in tortoise are caused by one or more pathogens. Most commonly Gram-negative bacteria are isolated but fungi, viruses, algae and also mixed infections are possible. Additionally, in this case ulcerative shell disease was associated with poor husbandry practices.

Publication: Życie Wet. 83, 1013–1017, 2008, fig. 9. In Polish, summary in English.

Klaudiusz O. Szczepaniak, Anna Łojarczyk-Szczepaniak, Janusz Karpiński

THE CASE OF RECCURENT ABSCESS IN BOA CONSTRICTOR

Przypadek nawracającego ropnia u boa dusiciela (*Boa constrictor*)

Abscesses are one of the most common dermatologic problems seen in reptiles. They are primary caused by unsuitable husbandry conditions, trauma or ectoparasites. There are differences between reptiles and mammals immune system, like lack of lysozymes and lymph nodes in reptiles. In contrast to liquid pus formed by mammals, in reptiles the formed abscess are presented as the hard subcutaneous masses, usually well encapsulated containing cheesy, thick pus. Diagnosis should be based on history, physical examination, laboratory analysis, including cytology and bacterial culture. Radiography, ultrasonography, resonance imaging or computed tomography may be necessary for localization of a foreign body and can be helpful to exhibit internal abscesses. The aim of this study was to present recurrent abscess of boa constrictor (*Boa constrictor*) resulting from the bite wounds. Successful treatment in this case was dependent on complete removal of abscess content with the snake tooth, as primary cause. There was shown the importance of different diagnostic tools for establishing effective therapy.

Publication: Życie Wet. 83, 671-674, 2008, fig. 5. In Polish, summary in English.

OTHER PUBLICATIONS

- SADZIKOWSKI A. B.: Animals the source of parasitic invasions for humans. Alveococcosis caused with *Echinococcus multilocularis* larvae (Zwierzęta źródłem inwazji pasożytów dla człowieka. Alweokokoza. Bąblowica powodowana przez larwy tasiemców *Echinococcus multilocularis*).
Publication: Aktualności AR (Lublin) 12, 21, 2008. In Polish.
- SADZIKOWSKI A. B.: Animals the source of parasitic invasions for humans. Babesiosis (Zwierzęta źródłem inwazji pasożytów dla człowieka. Babeszjoza).
Publication: Aktualności AR (Lublin) 12, 22, 2008. In Polish.
- SADZIKOWSKI A. B.: Animals the source of parasitic invasions for humans. Cryptosporidiosis (Zwierzęta źródłem inwazji pasożytów dla człowieka. Kryptosporidioza).
Publication: Aktualności AR (Lublin) 12, 23, 2008. In Polish.
- SADZIKOWSKI A. B.: Successful protect cows against parasites (Skutecznie chroń bydło przed pasożytami).
Publication: TopAgrar Polska. Bydło 9, 40–43, 2008. In Polish.
- SADZIKOWSKI A. B.: Inspected the herd before the winter (Przed zimą skontroluj stado).
Publication: TopAgrar Polska. Bydło 11, 32–35, 2008. In Polish.
- SADZIKOWSKI A. B., STUDZIŃSKA M. B., TOMCZUK K., SZCZEPANIAK K. O.: Coproscopic examinations of parasitic invasions in dogs and cats - interpretations of result (Interpretacja wyników badań koproskopowych psów i kotów).
Publication: Weterynaria w praktyce 5, 14–20, 2008. In Polish, summary in English
- SADZIKOWSKI A. B., TOMCZUK K., SZCZEPANIAK K. O., STĘPIEŃ-RUKASZ H.: Nematomorphia in veterinary practice (Nitnikowce w praktyce weterynaryjnej).
Publication: Essentia Vet. 2, 54–57, 2008, fig. 3. In Polish, summary in English
- TOMCZUK K.: Animals the source of pathogens for humans. Toxocarosis (Zwierzęta źródłem patogenów dla człowieka. Toxocaroz).
Publication: Gazeta Jastkowska 29, 52-53, 2008. In Polish.
- TOMCZUK K.: Zoonosis. Hydatidosis (Choroby odzwierzęce. Bąblowica).
Publication: Gazeta Jastkowska 30, 49–50, 2008. In Polish.
- TOMCZUK K.: Zoonosis. Toxoplasmosis – myths and facts (Choroby odzwierzęce. Tokso-plazmoza – mity i fakty).
Publication: Gazeta Jastkowska 31, 1–4, 2008. In Polish.

SUB-DEPARTMENT OF POULTRY DISEASES

Akademicka 12, Lublin

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

REPORTS TO RESEARCH MEETINGS

RZEDZICKI J., STĘPIEŃ-PYŚNIAK D., KOLASA A.: The birds an important link in the transmission of infectious diseases (Ptaki ważnym ogniwem w transmisji chorób odzwierzęcych).
Ref. XIII Congress of the Polish Veterinary Science Society „From Science to Practice”.
Olsztyn, 18–20 IX 2008.

Publication: Proceedings of the XIII Congress of the Polish Veterinary Science Society „From Science to Practice” 39–40, 2008. In Polish.

STĘPIEŃ-PYŚNIAK D., KOLASA A., RZEDZICKI J.: Analysis of bacterial microflora on the surface of consumption eggs originating from hens kept on a litter system. (Analiza mikroflory bakteryjnej na powierzchni skorup jaj konsumpcyjnych pochodzących od kur utrzymywanych w systemie ściółkowym).

Ref. XIII Congress of the Polish Veterinary Science Society „From Science to Practice”.
Olsztyn, 18–20 IX 2008.

Publication: Proceedings of the XIII Congress of the Polish Veterinary Science Society „From Science to Practice”, 55–56, 2008. In Polish.

STĘPIEŃ-PYŚNIAK D., KOLASA A., RZEDZICKI J.: Occurrence of bacteria of the genus *Staphylococcus* in the yolk of consumption eggs. (Występowanie bakterii z rodzaju *Staphylococcus* w żółtkach jaj konsumpcyjnych).

Ref. XIII Congress of the Polish Veterinary Science Society „From Science to Practice”.
Olsztyn, 18–20 IX 2008.

Publication: Proceedings of the XIII Congress of the Polish Veterinary Science Society „From Science to Practice”. 50–51, 2008. In Polish

OTHER PUBLICATIONS

KOLASA A.: The colonization of reproductive tract of hens and infection of eggs contents with *Salmonella* spp. (Kolonizacja narządów układu rozrodczego oraz zakażenia jaj kurzych pałeczkami z rodzaju *Salmonella*).

Publication: Magazyn Wet. Suppl. Birds Diseases, monograph., 5, 383–387, 2008. In Polish.

KOLASA A., RZEDZICKI J.: Antibiotic resistance of *Salmonella* spp. (Antybiotykooporność pałeczek *Salmonella*).

Publication: Weterynaria w terenie. 1, 16–21, 2008. In Polish

SUB-DEPARTMENT OF VETERINARY MICROBIOLOGY

Akademicka 12, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Aneta Nowakiewicz, Grażyna Ziółkowska

INTRASPECIES DIFFERENTIATION OF *Malassezia pachydermatis* STRAINS WITH PCR-REA TECHNIQUE

Wewnątrzgatunkowe różnicowanie szczepów *Malassezia pachydermatis*
z wykorzystaniem PCR-REA

The aim of study was an attempt to show intraspecies heterogeneity of *Malassezia pachydermatis* strains in bearing of their origin (strains isolated from healthy dogs and with otitis externa symptoms)

The studies included 41 strains of *Malassezia pachydermatis* species isolated in a pure culture from the dogs with clinical otitis externa symptoms (n = 20), the clinically healthy dogs (n = 20) and a reference strain *M. pachydermatis* (CBS7925). In order to isolate the genetic material from the fungal cells, the following four procedures were selected: mechanical, enzymatic, thermal and chemical. Considering the yield and repeatability of a method for the genomic DNA extraction, a mechanical method was applied. The genetic material research of each strain was performed according to PCR-REA technique with the amplification of three genome regions: ITS, LSU rRNA and a gene encoding beta-tubuline.

The regions ITS and LSU rRNA were amplified employing the standard PCR reagents, whereas the region coding beta-tubuline with so called touch down. The obtained amplification products were subjected to the restrictive analysis by the following enzymes: EcoRI, NcoI, HinfI, AluI, Eco881 (AvaI). The researches performed allowed to reveal the genotypic differentiation within *M. pachydermatis* species as well as some correlation between a genotypic profile and a

strain origin place (from healthy animals or with otitis externa symptoms). That may imply the existence of genetic conditioning of the *Malassezia* strains pathogenicity.

Publication: Medycyna Wet. (Lublin) 64, 737–848, 2008, fig. 7, tab. 3. In Polish, summary in English.

Adam Tylicki, Grażyna Ziółkowska, Aleksandra Bolkun,
Magdalena Siemieniuk, Jan Czerniecki, Aneta Nowakiewicz

**COMPARATIVE STUDY OF THE ACTIVITY AND KINETIC PROPERTIES
OF MALATE DEHYDROGENASE AND PYRUVATE DECARBOXYLASE FROM
Candida albicans, *Malassezia pachydermatis*, AND *Saccharomyces cerevisiae***

Candida albicans and *Malassezia pachydermatis* cause human and animal infections of the skin and internal organs. We compare the properties of two enzymes, pyruvate decarboxylase (PDC) and malate dehydrogenase (MDH), from these species and from *Saccharomyces cerevisiae* cultivated under aerobic and anaerobic conditions to find differences between the enzymes that adapt pathogens for virulence and help us in searching for new antifungal agents. *Malassezia pachydermatis* did not show any growth under anaerobic conditions, as opposed to *C. albicans* and *S. cerevisiae*. Under aerobic conditions, *C. albicans* showed the highest growth rate. *Malassezia pachydermatis*, contrary to the others, did not display any PDC activity, simultaneously showing the highest MDH activity under aerobic conditions and a K_m value for oxaloacetate lower than *S. cerevisiae*. *Candida albicans* and *S. cerevisiae* showed a strong decrease in MDH activity under anaerobic conditions. *Candida albicans* was observed to have four different isoforms of MDH, while *M. pachydermatis* and *S. cerevisiae* are characterized by two and three isoforms. *Candida albicans* exhibits about a twofold lower activity of PDC but, simultaneously, almost a threefold lower K_m value for pyruvate in comparison with *S. cerevisiae*. The PDC apofrom share under aerobic conditions in *C. albicans* was 47%, while in *S. cerevisiae* was only 26%; under anaerobic conditions, the PDC apofrom decreased to 12% and 8%, respectively. The properties of enzymes from *C. albicans* indicate its high metabolic flexibility (contrary to *M. pachydermatis*) and cause easy switching between fermentative and oxidative metabolism. This feature allows *C. albicans* to cause both surface and deep infections. We take into consideration the use of thiamin antimetabolites as antifungal factors that can affect both oxidative and fermentative metabolism.

Publication: Can. J. Microbiol. 54 (9), 734-741, 2008, fig. 4, tab. 2. In English.

REPORTS TO RESEARCH MEETINGS

BUDZIWOJSKA M., ZIÓLKOWSKA G., NOWAKIEWICZ A.: Participation of yeast-like fungi in natural microflora of wild boar and deer. (Udział grzybów drożdżopodobnych w naturalnej mikroflorze dzików i jeleni).

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 172, 2008.

MAJER-DZIEDZIC B.: Attempts of adaptation of viruses EBHS and RHD for cellular cultivation *in vitro*. (Próby adaptacji wirusów EBHS i RHD do hodowli komórkowej *in vitro*).

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 174, 2008.

TOKARZEWSKI S., ZIÓLKOWSKA G.: MIC as determinant of drug-resistant *Aspergillus niger* strains isolated in poultry flocks. (MIC jako wyznacznik lekowrażliwości szczepów *Aspergillus niger* izolowanych w stadach hodowlanych ptaków).

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 42, 2008.

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Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 108–109, 2008.

ZIÓLKOWSKA G., TOKARZEWSKI S.: Application of cylinder method dilution for meaning drug-sensitiveness of fungi. (Zastosowanie cylindrycznej metody rozcieńczeń do oznaczania lekowrażliwości grzybów)

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 56–57, 2008.

ZIĘTEK J., MAJER-DZIEDZIC B.: Influence of kitchen seasoning on growth of *Staphylococcus aureus* and *Escherichia coli*. (Wpływ przypraw kuchennych na wzrost bakterii *Staphylococcus aureus* i *Escherichia coli*).

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 446, 2008.

ZIĘTEK J., MAJER-DZIEDZIC B.: Detection of parvovirus in feces of dogs suspected of infection. (Wykrywanie parwowirusa w kale psów podejrzanych o zakażenie).

Publication: Proceeding XIII Congress of Polish Society of Veterinary Sciences „From science for practice” Olsztyn, 456–457, 2008.

SUB-DEPARTMENT OF VETERINARY PROPHYLAXIS

Akademicka 12, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Danuta Kowalczyk-Pecka, Andrzej Puchalski

POTENTIAL INTERACTION BETWEEN THE *Cepaea nemoralis* WILD SNAIL AND *Citrobacter* spp. BACTERIA

The aim of this study was to determine the effect of various dietary supplements on the level of selected unsaturated fatty acids, with potential antibacterial properties, in the hepatopancreas of *Cepaea nemoralis* snails, and to perform a preliminary phenotypic characterization of *Citrobacter braakii* strains occurring in the intestinal tract of these snails, which are environmental reservoirs for these bacteria. Gas chromatography was used for fatty acid analysis of the snails. Biochemical characteristics of *Citrobacter braakii* isolates and their resistance profiles for six chemiotherapeutics were determined. Giving *Cepaea nemoralis* food supplemented with *Allium sativum* (garlic), *Urtica dioica* (stinging nettle) and *Aloe vera* caused an increase in the total unsaturated fatty acids in the hepatopancreas. In the invertebrates studied, the *Aloe vera* and *Allium sativum* supplements caused an increase in arachidonic acid, while *Urtica dioica* increased oleic and linoleic acid content, which probably contributed to the 2-log CFU (colony forming unit) reduction of *Citrobacter* in the intestine. Wild snails of the genus *Cepaea* should be taken into consideration in epidemiological investigations as potential vectors for pathogenic strains of *Citrobacter* spp.

Publication: Medycyna Wet. (Lublin), 64, 786–790, 2008. In English, summary in English.

Andrzej Puchalski, Agnieszka Kolasa, Marta Dec, Renata Urban-Chmiel,
Danuta Kowalczyk-Pecka

**ELECTROPHORETIC CHARACTERIZATION OF OUTER MEMBRANE PROTEINS
OF *Salmonella Enteritidis* STRAINS GROWN IN DIVERSIFIED CONDITIONS
AND THE EVALUATION OF THEIR ANTIGENIC PROPERTIES**

Charakterystyka elektroforetyczna białek błony zewnętrznej szczepów *Salmonella Enteritidis*
hodowanych w zróżnicowanych warunkach oraz ocena ich właściwości antygenowych

The purpose of the study was both to evaluate the electrophoretic profiles (SDS_PAGE) of outer membrane proteins among *Salmonella Enteritidis* strains isolated from humans and poultry, as well as to identify the antigens which can induce the appearance of specific antibody response among vaccinated animals. The densitometry analysis of electrophoregrams showed that a single protein complex of 21 fractions was distinctive for strains grown in standard conditions. Among these fractions those with 20,22, 35 and 37 kDa characterized by high optical density were found dominant. A single protein profile with 24 fractions was also characteristic of strains grown in conditions with restricted access to iron ions. High optical density was a feature of proteins with 19, 35, 37, 55 and 74 kDa. Adding 200 μ M 2,2-dipyridyl to the culture medium caused the expression of proteins and 78 kDa taking part in obtaining and transporting iron through *S. Enteritidis* within a mass range of 19, 55, 70, and 74.

Densitometry analysis of electrophoregrams obtained from nitrocellulose membranes for proteins from bacterial strains grown in conditions with restricted access to iron ions indicated the presence of specific, intensive reactions towards the antigens of 35 and 55 kDa. As far as proteins obtained from bacterial culture grown with and without the addition of chelator were concerned, distinctive reactions were found towards antigens of 35 and 58 kDa. The main protein present in electrophoregrams of bacteria grown both with and without the addition of chelator were concerned, distinctive reactions were found towards antigens of 35 and 58 kDa. The main protein present in electrophoregrams of bacteria grown both with and without a supplement of chelator and in immunoblotting reactions was that of 35 kDa, belonging to porins of OmpA type.

Publication: Medycyna Wet. (Lublin), 64, 193–196, 2008, fig. 2. In Polish, summary in English.

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

**COMPARISON OF IMMUNOGENIC PROPERTIES OF NATIVE AND INACTIVATED
M. haemolytica LKT IN IMMUNOPROPHYLAXIS IN CALVES**

The aim of this study was to compare the immunostimulatory properties of Lkt of *M. haemolytica* inactivated by formaldehyde and glutaraldehyde and to evaluate the neutralizing properties of anti-Lkt antibodies.

The experiment was conducted on 20 Black-and-White Lowland calves of 100 kg body weight, assigned to 4 experimental groups. The animals were given subcutaneous vaccine injections with native Lkt, Lkt inactivated by formaldehyde or Lkt inactivated by glutaraldehyde. The anti-Lkt antibody titres were measured using an enzyme-linked immunosorbent assay (ELISA), based on absorbance of the sera obtained from the animals immunized with the different forms of Lkt. The protective effects of the antibodies present in the sera isolated from the vaccinated animals were estimated using an MTT assay.

Analysis of the ELISA absorbance values in the sera from calves in the vaccinated groups did not show any significant differences between the groups. The highest increase in absorbance of sera was observed in calves from the group that received formaldehyde-inactivated Lkt. In the case of calves immunized with native Lkt, the absorbance values were lower than in the group immunized with Lkt inactivated by formaldehyde. The lowest absorbance values were observed in the sera obtained from calves vaccinated with Lkt inactivated by glutaraldehyde. Analysis of the MTT assay results revealed the greatest Lkt-neutralizing properties of antibodies in the sera of calves immunized with two doses of a vaccine containing native Lkt and Lkt inactivated with formaldehyde.

Publication: Pol. J. Vet. Sci. 11, 83–88, 2008, fig. 2. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

BEDNAREK D., DUDEK K., URBAN-CHMIEL R.: Protective effect of Pastbov in calves experimentally challenged with *M. haemolytica* A1 leukotoxin. (Ochronne działanie szczepionki Pastobov u cieląt zakażonych eksperymentalnie leukotoksyną *M. haemolytica* A1).

Ref. XIII Congress Polish Society of Veterinary Sciences, Olsztyn 18-20 IX 2008.

Publication: Proceedings of the XIII Congress Polish Society of Veterinary Sciences 268, 2008. In Polish.

- BEDNAREK D., URBAN-CHMIEL R., DUDEK K.: Protective effect of Pastbov and alterations of peripheral blood leukocyte subpopulations in calves experimentally challenged with *M. haemolytica* A1 leukotoxin.
Ref. XXV World Buiatric Congress, Budapest, Hungary, 6–11 VII 2008.
Publication: Proceedings of the XXV World Buiatric Congress, Budapest, Hungary, 77, 2008. In English.
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Publication: Proceedings of the IX Middle European Buiatric Congress, 174, 2008. In English.
- DEC M., WERNICKI A., PUCHALSKI A., URBAN-CHMIEL R., WYSOKA M.: Bovine conglutinin – isolation, purification and electrophoresis analysis. (Konglutynina bydłęca – izolacja, oczyszczanie i analiza elektroforetyczna).
Ref. XIII Congress Polish Society of Veterinary Sciences, Olsztyn 18–20 IX 2008.
Publication: Proceedings of the XIII Congress Polish Society of Veterinary Sciences 272, 2008. In Polish.
- PUCHALSKI A., WERNICKI A., DEC M., URBAN-CHMIEL R., NAKIELSKI J., WYSOKA M.: Identification of *M. haemolytica* strains with using of PCR methods. (Identyfikacja *M. haemolytica* przy wykorzystaniu techniki PCR).
Ref. XIII Congress Polish Society of Veterinary Sciences, Olsztyn 18–20 IX 2008.
Publication: Proceedings of the XIII Congress Polish Society of Veterinary Sciences 287, 2008. In Polish.
- URBAN-CHMIEL R.: The meaning of the transport in pathogenesis of shipping fever in calves. (Znaczenie transportu w patogenezie shipping fever u cieląt.)
Ref. The IV Conference the Section of Neonatology, Polish Society of Veterinary Sciences Wrocław, 5–6 XII 2008.
Publication: Proceedings of the IV Conference the Section of Neonatology, Polish Society of Veterinary Sciences 223–239, 2008. In Polish.
- URBAN-CHMIEL R., PUCHALSKI A., DEC M., WERNICKI A.: The influence of different concentration of α -tocopherol and ascorbic acid on chosen immunological parameters of bovine leukocytes *in vitro*. (Wpływ zróżnicowanych stężeń α -tokoferolu i kwasu askorbinowego na wybrane parametry immunologiczne leukocytów bydłęcych w warunkach *in vitro*).
Ref. XIII Congress Polish Society of Veterinary Sciences, Olsztyn 18–20 IX 2008.
Publication: Proceedings of the XIII Congress Polish Society of Veterinary Sciences 295, 2008. In Polish.

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Publication: Lecznica Dużych Zwierząt, 9, 77–80, 2008, tab. 2. In Polish.

DEC M., PUCHALSKI A.: Use of oromucosally administered interferon- α in the prevention and treatment of animal diseases.

Publication: Polish J. Vet. Sci., 11, 175–186, 2008, fig.1, tab.1. In English

URBAN-CHMIEL R.: The influence of transport stress on susceptibility of cattle and sheep on *M. haemolytica* leukotoxin. (Wpływ stresu transportowego na stopień podatności bydła i owiec na działanie leukotoksyny *M. haemolytica*.)

Publication: Wydawnictwo Akademii Rolniczej, Lublin, 2007, 323, pp. 89.

DEPARTMENT OF ANATOMY AND ANIMAL HISTOLOGY

Akademicka 12, Lublin

Head: Prof. Dr. habil. Zbigniew Boratyński

SUB-DEPARTMENT OF ANIMAL ANATOMY

Akademicka 12, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Marcin Bartłomiej Arciszewski, Sylwester Barabasz, Jarosław Całka

IMMUNOHISTOCHEMICAL LOCALIZATION OF GALANIN RECEPTORS (GAL-R1, GAL-R2, AND GAL-R3) ON MYENTERIC NEURONS FROM THE SHEEP AND DOG STOMACH

Galanin exerts its biological activities (inhibitory or excitatory) via three different G protein-coupled receptors. In the present study, double immunocytochemical labeling was used to localize GAL-R1, GAL-R2 and GAL-R3 on PGP 9.5-positive myenteric neurons from the dog and sheep stomach/forestomachs. In both species, the occurrence of galanin in neurons and nerve fibers of gastric ganglia was also studied. Myenteric ganglia of the dog stomach were supplied with numerous, mainly varicose, galanin-immunoreactive (IR) nerve terminals whereas the frequency of galanin-positive nerve fibers in myenteric ganglia of the ovine stomach and forestomachs was moderate. The number of PGP 9.5-IR/galanin-IR myenteric neurons was significantly lower in the dog stomach ($12.3 \pm 1.3\%$) as compared to the sheep rumen ($20.1 \pm 0.7\%$), omasum ($19.5 \pm 2.9\%$),

abomasum ($23.8 \pm 1.2\%$) but not reticulum ($8.1 \pm 0.8\%$). In the canine stomach the frequencies of GAL-R1, GAL-R2 and GAL-R3 expressing myenteric neurons were statistically equivalent ($4.4 \pm 0.9\%$, $3.5 \pm 0.7\%$ and $3.1 \pm 0.5\%$, respectively). Immunoreactivity to GAL-R1 was absent in myenteric ganglia from the ovine rumen, reticulum as well as omasum. GAL-R1 was localized on 0.570.3% of myenteric perikarya from the abomasum. GAL-R2 bearing myenteric neurons were localized in the ovine rumen ($0.6 \pm 0.3\%$), reticulum ($0.5 \pm 0.3\%$), omasum ($1.0 \pm 0.2\%$) and abomasum ($1.1 \pm 0.3\%$). The percentages of PGP 9.5-IR/GAL-R3-IR neurons were $0.8 \pm 0.2\%$ in the rumen, 0.670.3% in the reticulum, $0.7 \pm 0.2\%$ in the omasum and $0.9 \pm 0.3\%$ in the abomasum. In all compartments of the sheep stomach, the proportions of GAL-R1, GAL-R2 and GAL-R3 expressing neurons were significantly lower when compared to analogous neuronal subpopulations present in the dog. It is suggested that, although endogenous galanin may potentially inhibit or stimulate the activity of sparse gastric enteric neurons, its general role in direct mediation of gastric motility and/or secretion seems to be of minor importance.

Publication: Ann. Anatomy 190, 360–367, 2008, fig 3. In English, summary in English.

Marcin Bartłomiej Arciszewski, Jarosław Całka, Mariusz Majewski

COCAINE- AND AMPHETAMINE-REGULATED TRANSCRIPT (CART) IS EXPRESSED IN THE OVINE PANCREAS

Indirect immunohistochemistry was applied to demonstrate the presence of cocaine and amphetamine-regulated transcript (CART) peptide expression in the pancreas of the sheep. Using double immunocytochemical staining, the coincidence of vasoactive intestinal polypeptide (VIP), neuropeptide Y (NPY) or substance P (SP) in CART-immunoreactive (IR) nerve fibers and intrapancreatic neurons was analyzed. Immunoreactivity to CART was detected in endocrine cells predominantly localized at the islet periphery. The exocrine pancreas and blood vessels were intensively innervated by CART-IR nerve fibers. Moderate numbers of CART-IR nerve terminals were found in the connective tissue, while the ductal system and islets were poorly supplied with CART-IR nerve endings. No islet penetrating CART-IR nerve fibers were detected. Approximately $53.7 \pm 1.8\%$ of intrapancreatic neurons displayed immunoreactivity to CART and pancreatic ganglia were moderately supplied with CART-IR nerve fibers. De-

pendent upon the pancreas region, CART-IR nerve fibers showed a varying degree of co-existence of SP, VIP or NPY. CART-IR intrapancreatic neurons very frequently co-localized with SP, moderately with VIP and rarely with NPY. We conclude that abundant immunoreactivity to CART in the ovine pancreas and the co-existence of CART with other regulatory peptides may reflect a possible involvement of CART in hormone and enzyme secretion as well as regulation of pancreatic blood flow.

Publication: Ann. Anatomy 190, 292–299, 2008, fig 3., tab. 1. In English, summary in English.

Marcin Bartłomiej Arciszewski, Elin Sand, Eva Ekblad

VASOACTIVE INTESTINAL PEPTIDE RESCUES CULTURED RAT MYENTERIC NEURONS FROM LIPOPOLYSACCHARIDE INDUCED CELL DEATH

The role of the enteric nervous system in intestinal inflammation is not fully understood and the plethora of cellular activities concurrently ongoing in vivo renders intelligible studies difficult. In order to explore possible effects of bacterial lipopolysaccharide (LPS) on enteric neurons we utilised cultured myenteric neurons from rat small intestine. Exposure to LPS caused markedly reduced neuronal survival and increased neuronal expression of vasoactive intestinal peptide (VIP), while the expression of Toll-like receptor 4 (TLR4) was unchanged. TLR4 was expressed in approximately 35% of all myenteric neurons irrespective of if they were cultured in the presence or absence of LPS. In neurons cultured in medium, without LPS, 50% of all TLR4-immunoreactive neurons contained also VIP. Addition of LPS to the neuronal cultures markedly increased the proportion of TLR4-immunoreactive neurons also expressing VIP, while the proportion of TLR4 neurons devoid of VIP decreased. Simultaneous addition of LPS and VIP to the neuronal cultures resulted in a neuronal survival comparable to controls. Conclusions: LPS recognition by myenteric neurons is mediated via TLR4 and causes neuronal cell death. Presence of VIP rescues the neurons from LPS-induced neurodegeneration.

Publication: Regulatory Peptides 146, 218–223, 2008, fig 4. In English, summary in English.

Jarosław Całka, Michał Zalecki, Marcin Bartłomiej Arciszewski

**CO-LOCALISATION OF NOS- AND CHAT-IMMUNOREACTIVITY IN THE SPINAL
AUTONOMIC NUCLEI OF THE PIG. AN IMMUNOCYTOCHEMICAL STUDY**

Our previous studies revealed an overlap of cholinergic and NO-ergic preganglionic neurons in the autonomic sympathetic and parasympathetic spinal cord nuclei of the pig. A close topographical as well as morphological relationship between both neuronal populations suggests a possible co-expression of the ChAT and NOS in the same autonomic neurons. Therefore, the goal of the present study was to determine the correlation between the ChAT- and neuronal NOS-immunoreactivity in the thoracic intermediolateral and sacral intermediolateral and intermediomedial nuclei. Double immunocytochemical staining revealed that many of the ChAT positive cell bodies demonstrated immunoreactivity to NOS. The number of the double stained cell bodies depended on the cross-section level. In the intermediolateral nucleus of the thoracic spinal cord about 60% of the ChAT-positive cells coexpressed also NOS, while in the intermediolateral nucleus of the S2 spinal segment constituted approximately 52%. The colocalisation of both substances in the intermediomedial nucleus varied from 39% at S1 level until 58% at S2 spinal plane. Our data provide morphological evidence confirming the co-expression of NOS in the spinal sympathetic and parasympathetic cholinergic neurons and suggest that NO may play a role in the modulation of the spinal cholinergic transmission.

Publication: Bull. Vet. Inst. Pulawy 52, 635–641, 2008, fig 3., tab. 1. In English, summary in English.

Jarosław Całka, Michał Zalecki, Krzysztof Wąsowicz,
Marcin Bartłomiej Arciszewski, Mirosław Łakomy

**A COMPARISON OF THE DISTRIBUTION AND MORPHOLOGY OF ChAT-, VAcHT-
IMMUNOREACTIVE AND AChE-POSITIVE NEURONS IN THE THORACOLUMBAR
AND SACRAL SPINAL CORD OF THE PIG**

Present knowledge concerning the organization of cholinergic structures of the spinal cord has been derived primarily from studies on small laboratory animals, while there is a complete lack of information concerning its structure in the pig. In the present study we employed choline acetyltransferase (ChAT) and vesicular acetylcholine transporter (VAcHT) immunocytochemistry and acetylcholinesterase (AChE) histochemistry to identify the cholinergic neuronal population in the thoracolumbar and sacral spinal cord of the pig. The distribution of

ChAT-, VAcHT- and AChE-positive cells was found to be similar. Distinct groups of cholinergic neurons were observed in the gray matter of the ventral horn, intermediolateral nucleus, intermediomedial nucleus as well as individual stained cells were found in the area around the central canal and in the base of the dorsal horn. Double staining confirmed complete colocalization of ChAT with AChE in the ventral horn and intermediolateral nucleus although in the intermediomedial nucleus only 64% of the AChE-positive neurons expressed ChAT-immunoreactivity, indicating unique, region restricted, diversity of ChAT and AChE staining. Our results revealed details concerning spatial distribution and morphological features of the cholinergic neurons in the thoracolumbar and sacral spinal cord of the pig. We also found that the pattern of distribution of cholinergic neurons in the porcine spinal cord shows great similarity to the organization of the cholinergic system in other mammalian species studied.

Publication: Veterinarni Medicina 53, 434-444, 2008, fig 4., tab. 1. In English, summary in English.

Radosław Szalak

**THE MORPHOLOGY OF NEURONS AND TOPOGRAPHY OF GYRUS
PARAHIPOCAMPALIS IN CHINCHILLA**

Morfologia neuronów i topografia zakrętu przyhipokampowego u szynszyli

The aim of the research was to get to know the structure and topography of gyrus parahippocampalis in chinchilla (*Chinchilla laniger*). The examination was carried out on 5 brains of sexually mature chinchillas. The material of the examination underwent fixing, dehydrating, embedding in paraffin. Frontal slices were stained according to Klüver and Barrer's method. Gyrus parahippocampalis which was the object of examination is a cortical structure which joins formation hippocampus with neocortex. It is a rear part of gyrus fornicatus which stretches from splenium of corpus callosum to the abdomino-medial angle of brain hemisphere. It is made up of the following cortical structures: area entorhinalis, parasubiculum and presubiculum. The above mentioned parts of gyrus parahippocampalis cortex are built of four layers: marginal layer, external cellular layer, medial cellular layer, and internal cellular layer.

Publication: Medycyna Wet. (Lublin) 64, 1240–1243, 2008. In Polish, summary in English.

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Ref. XXVII Congress of the European Association of Veterinary Anatomists, Budapest,
23–26 July 2008, Hungary
Publication: Hung. Vet. J. 130, suppl. III, 81–82, 2008. In English

ARCISZEWSKI M.B., BARABASZ S., CAŁKA J.: Galanin receptors (GAL-R1, GAL-R2, GAL-R3) are expressed on myenteric neurons from the sheep forestomachs/stomach.
Ref. XXVII Congress of the European Association of Veterinary Anatomists, Budapest,
23–26 VII 2008
Publication: Hung. Vet. J. 130, suppl. III, 81, 2008. In English.

CAŁKA J., ZAŁĘCKI M., ARCISZEWSKI M.B., ŁAKOMY M.: Colocalization of NOS- and ChAT-IR in the spinal autonomic nuclei of the pig: an immunocytochemical study.
Ref. XIII Congress of Polish Society of Veterinary Sciences, Olsztyn, 18–20 IX, 2008.
Publication: Congress materials 444–445, 2008. In English.

**SUB-DEPARTMENT OF HISTOLOGY
AND EMBRYOLOGY**

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Dr. habil. Jadwiga Jaworska-Adamu

REPORTS TO RESEARCH MEETINGS

CYBULSKA R., DMOWSKA M., PIERSIAK T., SCHOENBORN R., JAWORSKA-ADAMU J., WŁAŻ P.:
3-nitropropionic amid induces neuronal tolerance in hippocampus of epileptic rats.
Ref.: XXIV Congress of the Polish Physiological Society. Lublin, 11–13 IX 2008.
Publication: J. Physiol. Pharmacol., 59, suppl. 3, 64, 2008. In English.

DEPARTMENT OF BIOCHEMISTRY AND ANIMAL PHYSIOLOGY

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SUB-DEPARTMENT OF ANIMAL PHYSIOLOGY

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Head: Dr. habil. Iwona Puzio

RESEARCH STUDIES (SUMMARIES)

Piotr Dobrowolski, Ewa Śliwa

THE WEANING-RELATED CHANGES IN AMINO ACIDS STATUS OF BLOOD PLASMA IN PIGLETS

The aim of this study was to investigate changes of hormones and plasma amino acids in piglets subjected to weaning procedure. Twelve male piglets (Large Polish White breed) were used in the experiment. Piglets were held with their mothers from the birth up to 30 day of neonatal life and on this day weaned, and then housed individually for 5 days. Selected amino acids and insulin-like growth factor-1, growth hormone and cortisol concentrations in blood serum of piglets before and after weaning were analyzed. Insulin-like growth factor-1 concentration showed a tendency to decrease in 35 day old animals. There was no change of values of cortisol and GH concentration between not-weaned and weaned piglets. Cysteic acid plasma concentration was significantly higher in piglets after weaning, but the levels of taurine, threonine, glutamine, alanine, valine, leucine, ornithine were lower in 35-day-old piglets. In piglets after weaning, there was a tendency to increase plasma concentration of argin-

ine, glutamate and glycine. The analysis of plasma concentrations of other amino acids showed a tendency to lower values in piglets at the age of 35 days of post-natal live.

The mechanisms of the homeostatic control of amino acids metabolism in blood plasma were not able to keep adequate range of their concentrations after weaning. The obtained results of lowered levels of majority of amino acids indicate that inhibited growth rate and body weight gain of weaned piglets might cause the observed effects.

Publication: J. Pre-Clin. Clin. Res. (Poland), 2, 71–74, 2008 tab.2. In English, summary in English.

Małgorzata Kapica, Iwona Puzio, Ikuo Kato, Atsukazu Kuwahara,
Romuald Zabielski

ROLE OF FEED-REGULATING PEPTIDES ON PANCREATIC EXOCRINE SECRETION

In the recent two decades, a group of feed intake-regulating peptides (i.e., leptin, apelin, ghrelin, obestatin and orexins) was discovered. Besides the central nervous system these regulatory peptides are produced and released by the gastrointestinal (GI) endocrine cells and neurons, and functional receptors were found in the GI tract and the pancreas. High expression of feed intake-regulating peptides was found in stomach; however, they may be expressed in other GI tissues, too. The peptides control gastrointestinal functions, modulate orexigenic drive and energy metabolism via different mechanisms. Basal leptin, apelin, grelin and obestatin plasma concentrations correlated with BMI and we observed significant reduction of their concentrations following fundectomy in rats. We showed previously that exogenous leptin and ghrelin (a peptide derived from the same preprohormone as obestatin) inhibit the secretion of rat pancreatic juice through a neurohormonal mechanism. Intravenous obestatin was found to stimulate pancreatic protein output in anaesthetized rat via a CCK-vagal-dependent mechanism, whilst a direct action of obestatin on rat pancreatic acini *in vitro* resulted in opposite effect.

Intravenous boluses of apelin reduced the juice volume, protein and trypsin outputs in a dose-dependent manner. However, apelin administered into the duodenal lumen significantly increased pancreatic protein and trypsin outputs through a vagal mechanism. Orexin A & B were found to stimulate insulin release, though on the rat exocrine pancreas orexin A had no effect, and the effect

of orexin B was weak. Concluding, feed intake-regulating peptides participate in controlling the exocrine pancreas.

Publication: J. Physiol. Pharmacol. 59, suppl. 2, 145–159, 2008, In English, summary in English.

Iwona Puzio, Jose Luis Valverde Piedra, Małgorzata Kapica,
Marek Bieńko, Marta Pawłowska, Elżbieta Kusińska, Sylwia Szymańczyk

**THE EFFECT OF NA-BUTYRATE AND *Yucca schidigera* EXTRACT ON BONE QUALITY
IN DEVELOPING PIGS**

The aim of this study was to investigate the effects of Na-butyrate and *Yucca schidigera* extract treatment on skeletal development of pigs. The study was conducted from 14 to 56 day of postnatal life. Piglets were randomly assigned to control group fed a standard diet supplemented with a coated blend of organic acids (fumaric, malic and citric – 1.5 kg/t feed), and an experimental group fed a similar diet with the addition of coated Na-butyrate (900 g/t feed) and extract of *Yucca schidigera* (75 g/t feed). At age of 28, 35 and 56 day of life the piglets were slaughtered and the humera were isolated for further analyses. The bone formation and quality were measured based on weight, length, bone mineral content (BMC), bone mineral density (BMD), physical (ultimate strength, maximum elastic strength) and geometrical parameters. The bone weight and geometrical parameters such as cross-sectional area, second moment of inertia, mean relative wall thickness were significantly increased in the experimental 56 d old piglets. Furthermore, experimental diet induced significantly higher BMC and BMD and improved the mechanical endurance of bones in terms of the moments of maximum elastic strength and maximum strength. It is concluded that early postnatal treatment of piglets with Na-butyrate and extract of *Yucca schidigera* positively affects the development and function of the bones during growth.

Publication: KRMIVA (Zagrzeb), 50, 329–324, 2008, tab. 1. In English, summary in English.

Marcin Tatara, Ewa Śliwa, Witold Krupski, Marta Worzakowska

3-HYDROXY-3-METHYLBUTYRATE ADMINISTRATION DIMINISHES FUNDECTOMY-INDUCED OSTEOPENIA OF THE LUMBAR SPINE IN PIGS

The aim of the study was to test the hypothesis that oral administration of 3-hydroxy-3-methylbutyrate (HMB) positively influences bone metabolism and diminishes fundectomy-induced osteopenia of the axial skeleton in pigs. Eighteen male pigs were divided into three weight-matched groups at 40 d of life. Animals from the first and second groups were subjected to experimental fundectomy and the third group was sham operated. Starting the day after the fundectomy, the first and second groups received placebo and HMB, respectively. The effects of HMB administration on plasma amino acids concentrations, bone mineral density, morphology, and mechanical properties of the lumbar vertebrae were determined. The HMB treatment increased the weight of the vertebrae, bone mineral density, bone mineral content and plasma amino acid concentrations in the fundectomized pigs. HMB administration to fundectomized pigs improved plasma amino acids concentrations and diminished development of fundectomy-induced osteopenia of the axial skeleton.

Publication: Nutrition, 24, 753–760, 2008 tab.4. In English, summary in English.

REPORTS TO RESEARCH MEETINGS

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Ref. XXIV Congress of the Polish Physiological Society, Lublin, 11–13 IX 2008

Publication: Proceedings of the J. Physiol. Pharmacol. 59, suppl. 1, 332, 2008. In English.

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Ref. Joint Meeting EPC and IAP, Łódź, 25–18 VI 2008.

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Publication: J. Pre-Clin. Clin. Res. (Lublin) 2, 019-024, 2008. In English, summary in English.

SUB-DEPARTMENT OF BIOCHEMISTRY

Akademicka 12, Lublin

Head: Prof. Dr. habil. Marta Kankofer

RESEARCH STUDIES (SUMMARIES)

Marta Kankofer, Edyta Albera

POSTPARTUM RELATIONSHIP OF BETA CAROTENE AND VITAMIN A BETWEEN PLACENTA, BLOOD AND COLOSTRUM IN COWS AND THEIR NEWBORNS

Carotenoids are lipophilic compounds which are involved not only in scavenging reactive oxygen species but also in many important biochemical processes. Periparturient period is supposed to be connected with oxidative imbalance which can be detected in blood of mother and newborn. Colostrum contains antioxidants which should protect newborn from stressful conditions. The aim of present study was to evaluate the relationship of beta carotene and vitamin A concentration between placenta, blood and colostrum of cows and blood of their newborns. 12 pregnant, healthy cows and their newborns were included into study. The concentration of beta carotene and vitamin A were detected in homogenates of placental tissues obtained immediately after parturition as well as in blood of mother and newborn and colostrum. Additionally, blood and colostrum samples were collected 24 hours after parturition. The determinations were performed by use of spectrophotometric method at 325 and 453 nm.

The concentration of beta carotene was significantly higher in fetal as in maternal part of placenta. Plasma level significantly decreased during 24 h after parturition in cows but significantly increased in calves. Colostrum level remained relatively stable during the examined time.

The concentration of retinol was significantly higher in fetal as in maternal part of placenta. Plasma levels, significantly higher in cows than in calves, increased significantly during 24 h after parturition in mothers but remained unchanged in newborns. Colostral concentrations increased significantly during the examined period of time.

In conclusion, dynamic changes in carotenoid concentrations in placenta, blood of mother and newborn as well as in colostrum that occur during 24 h after parturition may indicate the importance of antioxidative defence at this time for both cow and calf.

Publication: Exp. Clin. Endo. Diabetes 116, 409–412, 2008, fig. 4. In English, summary in English.

Marta Kankofer, Justyna Lipko-Przybylska

PHYSIOLOGICAL ANTIOXIDATIVE/OXIDATIVE BALANCE IN BOVINE COLOSTRUM AND MATURE MILK

As colostrum provides the initial substrate supply, immunological compounds and antioxidants to neonate, the aim of present study was to determine antioxidative/oxidative status of bovine colostrum and milk. Colostrum was collected from healthy dairy cows (n = 15) immediately after parturition, 6, 18, 36 h and 7 days later. The total antioxidant capacity (TAC) expressed as $\mu\text{mol/g}$ protein was determined spectrophotometrically at 532 nm based on the reduction of tri-pyridyl-s-triazine (TPTZ). The indirect analysis of intensity of lipid peroxidation – LPI, (expressed as $\mu\text{mol/g}$ protein), corresponding to oxidation of peroxides, was measured spectrophotometrically at 505 nm. The TAC values have gradually increased from the 6th hour to the day 7 (36 h vs. 0 h and day 7 vs. 0 h: $p < 0.01$) and were maximal in mature milk (day 7) (day 7 vs. 36 h: $p < 0.05$) whereas LPI values slightly fluctuated within the same period reaching maximal values at 36 h (36 h vs. 0 h or 6 h or 18 h: $p < 0.05$). In parallel, the ratio TAC/LPI has progressively increased from 71.6 (0 h) to 177.6 (day 7). No overall positive correlation between TAC and LPI values was evidenced during the studied period. These results demonstrate dynamic changes of antioxidant systems while LPI remained stable, providing efficient neutralisation of radical oxygen species.

Publication: Acta Vet. (Beograd) 58, 231–239, 2008, fig. 3. In English, summary in English.

Witold Kędzierski, Małgorzata Kapica

PLASMA CONCENTRATION OF LEPTIN AND GHRELIN IN STANDARDBRED FOALS AS RELATED TO THE AGE, SEX, EXERCISE AND TRAINING

The effect of acute exercise was studied in a group of 42 clinically healthy young Standardbred trotters. These trotters were divided into four groups according to their age. Their ages were from one and a half to three years. Three jugular venous blood samples were collected via venopuncture from each horse. These samples were taken while 1) at rest, 2) after the end of the exercise and 3) thirty minutes after the end of the exercise. Exercise showed a significant increase in plasma leptin concentration (3.8 ± 0.31 at rest vs: 4.3 ± 0.37 just after exercise and 4.4 ± 0.47 ng/ml after 30 a minute rest; ANOVA $P < 0.05$). The difference between values obtained 30 min. after exercise and at rest was significantly greater in 1.5-year-old horses than in aged 2.5 years ($+1.3 \pm 0.43$ vs: $+0.1 \pm 0.15$ ng/ml; ANOVA $P < 0.05$). The mean plasma leptin concentration was higher in fillies than in colts (4.9 ± 0.47 vs: 3.5 ± 0.36 ng/ml; ANOVA $P < 0.05$). A positive correlation between the plasma concentrations of leptin and triacylglycerides (TG) measured just after exercise was detected ($r = 0.65$). The acute exercise significantly increased the plasma concentration of ghrelin that was measured just after exercise (1255 ± 55.9 vs: 1127 ± 54.2 pg/ml; ANOVA $P < 0.05$). The exercise induced age-related changes in the plasma ghrelin concentration were significantly lower in 2.5-year-old trotters than in 1.5-year olds. To sum up, the changes in plasma leptin and ghrelin concentrations during bouts of exertion tends to decrease with age and/or training of Standardbred foals.

Publication: International J. Animal Bioscience (Cambridge) 2, 582–587, 2008, tab. 4. In English, summary in English.

Witold Kędzierski, Małgorzata Kapica, Ryszard Kolstrung, Michał Pluta

CONCENTRATIONS OF PLASMA LEPTIN, GHRELIN AND PARAMETERS OF LIPID METABOLISM IN PUREBRED ARABIAN AND PONY MARES DURING PERIPARTURIENT PERIOD

Stężenie leptyny, greliny i wskaźników metabolizmu lipidów w osoczu krwi kłaczy czystej krwi arabskiej i kuców felińskich w okresie okołoporodowym

The aim of this study was to investigate the relationship between blood plasma levels of leptin, ghrelin and parameters of lipid metabolism during peripartum period in mares. The investigation included 15 purebred Arabian broodmares 5 to 13-years-old and 6 pony mares from 9 to 16-years-of-age. The blood samples were collected two weeks before the term of anticipated foaling and on

day 0, 3, 9, 15 and 22 post partum. The levels of leptin and ghrelin in blood plasma were determined using RIA kits (Linco Research) and the concentration of triacylglycerols (TG), glycerol, free fatty acids (WKT), total cholesterol and HDL cholesterol were measured via enzymatic methods. The plasma concentration of leptin, WKT, total cholesterol and HDL cholesterol attained maximum values at parturition day. Plasma TG and LDL cholesterol levels were the highest in late pregnancy and diminished in the days following parturition. The values of glycerol, WKT, total cholesterol and HDL cholesterol were lower and the levels of leptin and ghrelin were higher in purebred Arabian than in pony mares. A negative correlation was found between the plasma leptin concentration and the WKT/TG ratio. Leptin can play an important role in regulation of lipid metabolism during the periparturient period in mares.

Publication: Medycyna Wet. (Lublin) 64, 427–430, 2008, tab. 2. In Polish, summary in English.

Dorota Nieoczym, Edyta Albera, Marta Kankofer, Piotr Wlaź

MAXIMAL ELECTROSHOCK INDUCES CHANGES IN SOME MARKERS OF OXIDATIVE STRESS IN MICE

The oxidative/antioxidative status was investigated in maximal electroshock-induced seizures in mice, a well established model of generalized seizures in humans. Mice were given a single electroshock resulting in tonic convulsions. Total antioxidant capacity (TAC), lipid peroxidation intensity and glutathione peroxidase (GSH-Px) activity was measured spectrophotometrically in the brain, plasma and erythrocytes collected from mice sacrificed at different time points after stimulation. For comparison, sham-stimulated and subeffectively stimulated (no tonic seizures) mice were used.

Tonic seizures caused an immediate increase in GSH-Px activity in the brain and during the following three hours the enzyme activity decreased below control values. Similar changes were seen after subconvulsive stimulations, however, a significant increase occurred only one hour after electroshock. A marked TAC reduction in the brain was observed three hours after subconvulsive stimulations. Nevertheless, no significant changes in TAC after tonic seizures were noted. TAC in plasma was significantly reduced three hours after both subconvulsive and convulsive stimulation. Marked reduction of lipid peroxidation intensity in the brain and plasma was recorded after both modes of stimulation. In

conclusion, pronounced changes in oxidative-antioxidative status in mice following electroshock are caused by both convulsive and subconvulsive stimuli. Participation of oxidative stress in seizures and pathophysiology of epilepsy awaits further clarification.

Publication: J. Neural Transmission, 115, 19–25, 2008, fig. 3. In English, summary in English.

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Publication: Proceedings of the Conference of the Section of Physiology and Pathology of the Horse of the Polish Association of Veterinary Science, 24–27, 2008. In Polish.

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DEPARTMENT AND CLINIC OF ANIMAL INTERNAL DISEASES

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

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Publication: Proceedings of the XIII Kongresu PTNW, 277, 2008. In Polish.

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Publication: Proceedings of the 17 International Symposium of Polish Network of Molecular and Cellular Biology. Cracov, June 5–6, 2008, 308-309, 2008. In English.

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Publication: Magazyn Wet., suppl. Zwierzęta egzotyczne, 17–23, 2008. In Polish.
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Publication: Magazyn Wet., suppl.: Zwierzęta egzotyczne, 64–69, 2008. In Polish.
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Publication: Essentia Vet. 2, 50–52, 2008. In Polish.

DEPARTMENT AND CLINIC OF ANIMAL REPRODUCTION

Głęboka 30, 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)

Leszek Krakowski, Zygmunt Wrona, Krzysztof Kostro, Barbara Zdzisińska

SERUM CONCENTRATION OF IGF-I AND IGF-II IN PREGNANT MARES IN A PERIMPLANT PERIOD

Stężenie insulinopodobnych czynników wzrostu IGF-I i IGF-II w surowicy żrebnych klaczy
w okresie okołooplantacyjnym

In reproduction of animals and humans insulin-like factors (IGF-I , IGF-II) play a significant role. Among others, they stimulate growth of ovarian follicle, embryo development, egg implantation and inhibit cell apoptosis. In horses the implantation process and development of placenta is partly regulated by IGF-I and IGF-II. The studies revealed the existence of some differences in the level of IGF-I and IGF-II. A significant increase of IGF-I in comparison to the preovulation period (311 ng/ml) was noted 12 h after ovulation (356 ng/ml), 72 h (328 ng/ml), 7 days (340 ng/ml) and at 35 (344 ng/ml) and at 55 (360 ng/ml) day of gestation. The concentration of IGF-II also increased but only to day 6 after ovulation. The concentration of IGF-II before ovulation was 4,8 ng/ml and during 6 days after ovulation it amounted from 8,2 to 9,6 ng/ml. The differences in the levels of IGF-I and IGF-II before and after ovulation and in pregnancy could result from activation of an embryo genome and preparation of endometrium for implantation.

Publication: Medycyna Wet. (Lublin) 64, 237–239, 2008, fig. 2. In Polish, summary in English.

Marek Szczubiał

CONCENTRATION OF IFN- γ IN SERUM SOWS WITH MMA SYNDROME

Kształtowanie się stężenia IFN- γ w surowicy sów z zespołem MMA

The aim of the present study was to determine level of IFN- γ in serum of sows with the MMA syndrome. Determinations were carried out in 10 sows that developed the MMA syndrome postpartum (experimental group) and in 10 healthy sows (control) from one closed production cycle farm. The levels of IFN- γ were measured 48–72 and 12–24 h before parturition as well as 12–24 and 48–72 h postpartum using the ELISA method. The findings revealed significantly increased level IFN- γ in the experimental group both before parturition and postpartum. The results indicate that IFN- γ is involved in the pathogenesis of the MMA syndrome and that its determination is useful for early diagnosis and monitoring of the disease.

Publication: Annales UMCS (Lublin), sectio DD, 63, 17–23, 2008, tab.1. In Polish, summary in English.

Marek Szczubiał, Roman Dąbrowski, Mariola Bochniarz, Wojciech Łopuszyński

CONCENTRATION OF C-REACTIVE PROTEIN AND SERUM AMYLOID A IN SERUM OF BITCHES WITH MAMMARY GLAND TUMORS

Stężenie białka C-reaktywnego i surowiczego składnika amyloidu A w surowicy suk z nowotworami gruczołu sutkowego

The aim of the present study was to determine a concentration of C-reactive protein (CRP) and serum amyloid A (SAA) in bitches suffering from spontaneously occurring mammary gland tumors. The experiment involved 30 bitches with malignant gland tumors removed surgically (carcinoma complex – 40%, carcinoma simple – 26.7%, sarcoma – 23.3%, carcinosarcoma – 10%) and 10 clinically healthy bitches. Measurements of the CRP as well as SAA serum concentration were performed using a commercial ELISA test.

The concentration of CRP as well as SAA were significantly higher in bitches with sarcomas or carcinosarcomas compared with the animals with carcinomas (complex or simple) and control group. Histopathological examination showed extensive areas of necrosis and inflammatory reactions in most sarcomas

and carcinosarcomas. Most likely these were the main causes of the CRP and SAA increase in the serum of bitches with these type of tumors.

Publication: Medycyna Wet. (Lublin) 64, 818–821, 2008, fig. 3, tab. 2. In Polish, summary in English.

Marek Szczubiał, Roman Dąbrowski, Marta Kankofer, Mariola Bochniarz,
Edyta Albera

CONCENTRATION OF SERUM AMYLOID A AND ACTIVITY OF CERULOPLASMIN IN MILK FROM COWS WITH CLINICAL AND SUBCLINICAL MASTITIS

The aim of the study was to determine the concentration of serum amyloid A (SAA) and the activity of ceruloplasmin (Cp) in milk from cows with clinical mastitis of various severities and with subclinical mastitis in aspect of their usefulness for detection of mastitis in cows. The concentration of SAA was determined using the commercial ELISA test (Tridelta Development Ltd., Greystones, Wicklow, Ireland). The activity of Cp was determined according to the Rice *et al.* method.

The mean concentration of SAA in milk from cows with mastitis ranged from 4.47 to 322.26 µg/ml. The mean SAA concentration in milk from healthy cows was 11.67 (±7.40) µg/ml and was significantly lower ($P < 0.01$) compared to that in milk from cows with the particular forms of mastitis. The activity of Cp in milk from cows with mastitis ranged from 3.00 to 18.83 U/g of protein. Both in clinical and subclinical mastitis the activity of Cp was significantly higher ($P < 0.001$) compared to that in milk from cows with healthy mammary glands (1.20 ± 0.42 U/g of protein). The findings revealed that both the SAA concentration and Cp activity were sensitive indicators of inflammatory processes in the udder, even those graded as mild. Their determination in milk may be a reliable and non-invasive diagnostic method to detect mastitis, particularly useful for its subclinical form.

Publication: Bull. Vet. Inst. Pulawy 52, 391–395, 2008, tab. 2. In English.

Marek Szczubiał, Marta Kankofer, Edyta Albera, Wojciech Łopuszyński,
Roman Dąbrowski

**OXIDATIVE/ANTIOXIDATIVE STATUS OF BLOOD PLASMA IN BITCHES
WITH MAMMARY GLAND TUMOURS**

The aim of present study was the estimation of oxidative/antioxidative status of bitches with mammary gland tumours – determination of lipid peroxidation intensity, a concentration of glutathione and beta-carotene as well as total antioxidant capacity (TAC) in blood plasma. The experiment was carried out on 18 bitches with spontaneously occurring mammary gland tumours (12 with malignant tumours and 6 with benign ones) and 6 clinically healthy controls. The intensity of lipid peroxidation did not differ significantly between the examined groups of animals. The concentration of glutathione was higher in both groups neoplasm than in healthy bitches but the differences were not significant. The concentration of beta-carotene in plasma was similar in cases of malignant and benign tumours but was significantly lower ($p < 0.05$) than in healthy controls. TAC of plasma was lower in bitches with tumours than in healthy animals. A significant difference was noticed between malignant tumours and controls ($p < 0.01$). In conclusion, the alterations in antioxidative status suggesting the presence of general antioxidative stress in bitches with mammary gland tumours occur. The necessity of more frequent sample collection for the detection of dynamic changes in peroxidation process revealing the intensity of oxidative stress in bitches suffering from mammary gland tumours should be considered.

Publication: Bull. Vet. Inst. Pulawy 52, 255–259, 2008, tab. 2. In English.

Marek Szczubiał, Renata Urban-Chmiel

**TUMOUR NECROSIS FACTOR- α AND INTERLEUKIN-6 CONCENTRATION
IN THE SERUM OF SOWS WITH THE MMA SYNDROME**

The aim of the presented study was to determine levels of TNF α and IL-6 in serum of sows with the MMA syndrome. Determinations were carried out in 10 sows that developed the MMA syndrome postpartum (experimental group) and in 10 healthy sows (control) from one closed production cycle farm. The levels of TNF α and IL-6 were measured 12–24 and 48–72 h before parturition as well as 12–24 and 48–72 h postpartum using the ELISA method. The findings revealed significantly increased postpartum levels of

TNF α in both groups. Compared to the control group, the levels of TNF α in the experimental group were significantly higher 12–24 h before parturition and 48–72 h postpartum. The IL-6 levels significantly increased in the experimental group 48–72 h after the parturition. At both postpartum measurement points, the levels of IL-6 were significantly higher in the experimental group than those in controls. The results indicate that TNF α and IL-6 are involved in the pathogenesis of the MMA syndrome and that their determination is useful for early diagnosis and monitoring of the disease.

Publication: Bull. Vet. Inst. Pulawy 52, 267-270, 2008, tab. 2. In English.

Władysław Wawron, Tomasz Piech, Mariola Bochniarz

ANTIBIOTIC SENSITIVITY OF PATHOGENS ISOLATED FROM COWS WITH MASTITIS

Wrażliwość na antybiotyki patogenów izolowanych z przypadków mastitis u krów

In the study, antibiotic sensitivity of 3788 staphylococcus strains, 1981 streptococcus strains and 124 *Escherichia coli* strains isolated from cows with mastitis was tested. Milk samples were collected from individual dairy farms of the Lublin region. During the 6-year study cycle, we determined the sensitivity of isolated bacteria to the following antibiotics: penicillin, streptomycin, tetracyclines, neomycin, ampicillin, amoxicillin and cefoperason. Streptococci showed the highest sensitivity to cefoperason (84.9–98.2% of susceptible strains) and amoxicillin (50.9–95.7%). The highest percentage of staphylococcus strains was sensitive to amoxicillin (from 100% in 2002 to 80.5% in 2006) and to ampicillin (92.3%, on average). *E. coli* was characterised by a relatively low sensitivity to the antibiotics examined. The highest percentage of its strains was sensitive to neomycin and streptomycin (83.2 and 78.1%, respectively). Moreover, *E. coli* was found to be 100% resistant to penicillin throughout the study period. In general, the percentage of strains sensitive to the antibiotics tested decreased significantly, particularly in the final year of observations.

Publication: Medycyna Wet. (Lublin), 64, 1232–1135, 2008. tab. 3. In Polish, summary in English.

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Ref. XIII Congress of the Polish Society of Veterinary Sciences, Olsztyn 18–20 IX 2008.
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Publication: Proceedings of the XIII Congress of the Polish Society of Veterinary Sciences, 292, 2008. In Polish.

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Publication: Essentia Vet. 2, 50–52, 2008, In Polish, summary in English.

DEPARTMENT AND CLINIC OF ANIMAL SURGERY

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Dr. habil. Ireneusz Balicki

RESEARCH STUDIES (SUMMARIES)

Ireneusz Balicki

CHRONIC SUPERFICIAL KERATITIS IN DOGS CURRENT METHODS OF DIAGNOSIS AND THERAPY

Przewlekłe powierzchowne zapalenie rogówki u psów – diagnostyka i terapia

Chronic superficial keratitis (*keratitis superficialis chronica*) is common potentially blinding, ocular diseases of dogs. The illness proceeds with the symptoms of blood vessels ingrowing, infiltration of the fibro-vascular tissue and the corneal pigmentation which appear in bottom quadrants of cornea. It is thought to be an immunological based illness but the exact reason for chronic superficial keratitis is still unknown. The main environmental factor, which is of great importance in aetiology of the illness is known to be the UV radiation. are corticosteroids. The corticosteroids applied in form of eye drops or ointment are basic drugs used for the initial therapy. Cyclosporine is of great importance in the chronic superficial keratitis therapy. The therapeutic ability of pimecrolimus and 50% dimethyl sulfoxide (DMSO) were tested in the last time. In the severe cases, indispensable treatment consists of performing superficial keratectomy, cryosurgery or β irradiation. The patients suffering from the disease are ill for all their lives. In spite of clinical symptom disappearance many of them show the illness progression.

Publication: Medycyna Wet. (Lublin) 64, 40–44, 2008, fig. 6. In Polish, summary in English.

Ireneusz Balicki, Krzysztof Radziejewski, Piotr Silmanowicz

STUDIES ON *KERATOCONJUNCTIVITIS SICCA* INCIDENCE IN CROSSBREED DOG

Badania nad występowaniem *keratoconjunctivitis sicca* u psów mieszańców

The present researches aimed at determination of *keratoconjunctivitis sicca* occurrence in cross breed dogs. The investigations covered 36 mongrel dogs with *keratoconjunctivitis sicca* recognized by the ophthalmic examination. Patients' age and sex was established. The ophthalmic evaluation protocol included: the conjunctiva examination (humidity, redness, discharge), the corneal examination (transparency, vessel ingrowth, pigmentation, defects), Schirmer tear test. The highest incidence among the cross breed dogs was reported between 6 and 9 year of age, males accounted for 64% of cases. In a clinical study involving 61 corneas, 10 appeared to be completely opaque. The pigmentation occurred in 75% corneas. The corneal defects were noted in 50% cases. A 10–15 mm/min Schirmer test was established in 29% of cases, while 0–5 mm/min in 28%.

Publication: Pol. J. Vet. Sci. 11, 353–358, 2008, fig.3, tab.3. In Polish, summary in English.

Ireneusz Balicki, Grażyna Ziółkowska, Anna Śmiech

POLIETHIOLOGICAL ULCERATIVE MYCOTIC KERATITIS IN HORSE

Grzybicze wrzodziejące zapalenie rogówki o złożonej etiologii u konia

The authors report a clinical case of poliethiological ulcerative mycotic keratitis in horse. The disease was diagnosed with mare, bay colour, aged 7 years. The ocular examination revealed in the inferior cranial quadrant of the right cornea: the superficial and deep blood vessel ingrowth, oedema, multifocal dark brown subepithelial infiltrations as well as superficial corneal ulceration with the demarcated epithelial. The impression cytology and mycological evaluation showed the presence of *Aspergillus fumigatus* as well as single colonies of *Aspergillus flavus* in the examined research material.

The horse was surgery treated and with the use ophthalmic drops containing 0,2% fluconazole and 30% DMSO mixture. Oral fluconazole 500 mg was given twice a day. The ophthalmic examination revealed the complete recovery of the corneal ulceration, with a white scar 2 weeks after operation. The pharmacological treatment was continued by 12 weeks. The control check-up a year after the

treatment institution showed no blood vessels growing into the cornea, marked diminishment of the postoperative scar as well as higher corneal transparency at the ulcer site.

Publication: Medycyna Wet.(Lublin) 64, 1407–1410, 2008, fig. 6. In Polish, summary in English.

Adam Brodzki, Marcin Rafał Tatar, Kazimierz Pasternak,
Małgorzata Sztanke, Piotr Silmanowicz, Witold Krupski

**SERUM CONCENTRATION OF CALCIUM, MAGNESIUM, COPPER AND ZINC IN SHEEP
TREATED WITH β -HYDROXY- β -METHYLBUTYRATE (HMB)
DURING THE FIRST 21 DAYS OF NEONATAL LIFE**

Neonatal period of life in mammals is characterized by very intensive processes of growth and development, extremely high demand for nutrients, vitamins, macro- and microelements, as well as high sensitivity to metabolic factors. The aim of the study was to investigate the serum concentration of calcium, magnesium, copper and zinc in sheep administered via gastrointestinal (GI) tract with β -hydroxy- β -methylbutyrate (HMB) during the first 21 days of neonatal life. The determination of calcium, magnesium, copper and zinc concentration in serum obtained from 21 and 130 day old lambs was performed using spectrophotometric atomic absorption method and PAY-UNICAM apparatus.

The results obtained in this study showed beneficial long-term effects of neonatal treatment with HMB during the first 3 weeks of life in lambs on serum concentration of calcium, magnesium, copper and zinc. These results may have practical implications in sheep breeding, especially when one considers importance of physiological functions of calcium, magnesium, copper and zinc in organism and the fact that the concentration of these elements has not exceeded behind the physiological norms in sheep after the treatment with HMB.

Publication: Pol. J. Environ. Stud., 17(1B), 46–49, 2008. In English.

Bogumił Lewandowski, Piotr Silmanowicz, Roman Dąbrowski

DOUBLE-LAYER REPAIR OF A HARD PALATE DEFECT IN A DOG

Wykorzystanie dwuwarstwowej plastyki miejscowej
w leczeniu ubytku podniebienia twardego u psa

Based on the review of literature and their own clinical experience, the authors presented the merits of local flap repair of posttraumatic hard palate defects in dogs. In the case described, the dog underwent surgery due to a posttraumatic defect of the hard palate. The defect resulted from damage to the facial skeleton and caused food and fluid penetration to the nasal cavity as well as choking and coughing while eating. The palatal defect was repaired with the neighbouring flaps, creating the first layer with two rotated palatal flaps and an external one with the flap from the oral vestibule. The fistula was entirely covered and the oral cavity separated from the nasal cavity.

Publication: Medycyna Wet. (Lublin) 64, 207–209, 2008, fig 4. In Polish, summary in English.

Izabela Polkowska, Aleksandra Sobczyńska-Rak, Piotr Silmanowicz,
Anna Szyszkowska

METHODS OF MANDIBULA FRACTURE STABILIZATION

Metody stabilizacji złamań kości zuchwy

Mandible fractures in animals result mainly from traffic accidents, falling and biting by other animals. This paper presents clinical management of mandible fractures in animals. The most common methods of mandible fracture fixation with the use of interdental wire, intramedullary nails, bone plates and acrylic devices have been reviewed. In conclusion, methodological approach to mandible fracture fixation depends on the size of the bone defect as well as technical possibilities and the surgeon's experience. The major condition of recovery is obtaining the mandible bone stabilisation and proper occlusion. The postoperative treatment is also very important: one should consider whether the muzzle, oropharyngeal tube etc. should be used. In order to prevent further complications, appropriate antibioticotherapy and regular hygiene of oral cavity should be applied.

Publication: Medycyna Wet. (Lublin) 64, 1083–1086, 2008, fig. 7. In Polish, summary in English.

Izabela Polkowska, Anna Szyszkowska

**ORTHODONTIC TREATMENT PROCEDURES FOR DENTAL ANOMALIES IN DOG.
CASE REPORTS**

Metody leczenia ortodontycznego wad zębowych u psów. Opis dwóch przypadków

The present study reports the treatment methods for two dogs with tooth-occlusion abnormalities using orthodontic-jaw appliances. Prevailing majority of dental topographic disorders deal with the pathological tooth positioning in the dental arch. This type of dental abnormality in juvenile dogs may produce damage of the oral cavity mucosa that consequently develops non-healing decubitus ulcers. Then, orthodontic procedures designed to correct the causative teeth positioning in the dental arch remain the treatment of choice. Dogs with occlusal disharmony can be supplied with an orthodontic cure through mounting a fixed active appliance or Schwarz single-jaw plate.

Publication: Medycyna Wet. (Lublin) 64, 1411–1415, 2008, fig. 7. In Polish, summary in English.

Aleksandra Sobczyńska-Rak, Izabela Polkowska, Anna Śmiech,
Piotr Silmanowicz

A CASE OF ILEAL LYMPHOSARCOMA IN A DOG

Przypadek chłoniaka złośliwego jelita biodrowego u psa

The occurrence of intestinal tumors is relatively seldom. The article describes a case of a dogs ileal neoplasia. Symptoms like persistent diarrheas, significant body loss and reduced mobility occurred. Radiography of the abdomen revealed a tumor of 10 cm in diameter located in the left subcostal area. Blood results showed leukocytosis and an elevated activity of alkaline phosphatase. The tumor was removed during laparotomy, and a part of the jejunum was resected. Histopathology showed the presence of T-cell lymphosarcoma. The patient's health deterioration came 4 months after the surgery. Repeated radiography and ultrasonography revealed secondary cancers in different organs. The dog was euthanased. Necropsy confirmed metastases in intestines, lungs, liver, and kidneys. Therapeutic procedures on malicious tumors of alimentary tract, including this case of ileal lymphosarcoma, are described.

Publication: Medycyna Wet. (Lublin) 64, 889–892, 2008, fig. 4. In Polish, summary in English.

Dorota Róžańska, Paweł Róžański, Adam Brodzki

**THE INFLUENCE OF MANIPULATIVE STRESS ON CARDIOPULMONARY CHANGES
IN NEW ZEALAND WHITE RABBITS**

There are a number of uses of the domestic rabbit. Because of their economic usefulness rabbits' husbandry is important and promising direction of animal production. However, rabbits belong to relatively poorly diseases resistant and sensitive animals. It is generally considered that they are particularly stress susceptible, therefore during executing of most of investigations one should behave very carefully with them. The aim of the study was to estimate the influence of stress reaction, related with sudden change of living conditions and clinical examination, on cardiac and respiratory systems' function in New Zealand White rabbits. There were compared the values of parameters measured during clinical examination and the values of parameters measured after sedation with the combination of medetomidine-midazolam-atropine with the values recognized as norms (physiological range) characteristic for rabbit species.

Publication: J. Pre-Clinical and Clinical Res.(Lublin) 1 (2), 189–192, 2007, tab. 2. In English.

Paweł Róžański, Dorota Róžańska, Henryk Krukowski, Anna Majewska

A STUDY ON WARBLE INFESTATION IN HORSES FROM EASTERN POLAND

Parasites still remain a serious challenge in horse breeding as they not only endanger animal health but pose a threat to its life as well. Out of the parasitic infections, warble infestation deserves a discussion as this group of parasitic skin conditions is subclinical in its detriment and most frequently and adversely affects the development of a juvenile horse. This fact is related to the mechanism of parasite life cycle which induces extensive tissue damage during its development stage. The present study revealed an increased *Gasterophilus* sp. warble fly burden in horse stomachs, from 20.4% in the first 10 days of June up to 25.8% in the third 10 days' period of this month. In I study period, male horses were shown to be affected by the invasion more often (24.16%), while in II period – females (33.3%). The highest invasion extensivity was determined in II study period in horses aged 2–3 years (37.93%), whereas the least affected group appeared to be animals at 2–5 year of age examined in the first 10 days of June.

Publication: Annales UMCS (Lublin), sectio EE 26, 25–33, 2008, tab. 3. In English, summary in English.

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Publication: Magazyn Wet. 7, 768–770, 2008. In Polish.
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Publication: Bulletin PSUIPKR (Lublin) 11, 12–15, 2008. In Polish.
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Publication: Magazyn Wet. 17, 179–180, 2008. In Polish.

**LABORATORY
OF VETERINARY RADIOLOGY
AND ULTRASONOGRAPHY**

Głęboka 30, Lublin

Head: Dr. Renata Komsta

**RESEARCH STUDIES
(SUMMARIES)**

Renata Komsta, Piotr Dębiak, Piotr Twardowski

**RADIOGRAPHIC EVALUATION OF JOINTS IN DOGS WITH ELBOW DYSPLASIA
– CLINICAL OBSERVATIONS**

The objective of the study was to present the results of radiographic evaluations of elbow joints in dogs with recognised elbow dysplasia. The research covered 40 dogs, and both elbow joints of each animal were examined and graded. In a dysplastic joint, one or a few conditions resulting in the dysplasia were assessed as well as a degree of degenerative joint disease. In addition, the incidence of other disorders of the skeletal system was considered. In the dysplastic joints, fragmentation of the medial coronoid process (in 88.7%), along with joint incongruity (in 71.8%) were observed most frequently. The lesions were manifested with relatively slight clinical signs. The dogs were usually brought for the clinical and radiographic examinations when the progression of arthritic changes reached the 2nd grade in at least one joint (50% of the animals examined). A possibility for early detection of elbow dysplasia, if some other diseases of the skeletal system did not occur, was 20% in the examined group of dogs.

Publication: Bull. Vet. Inst. Pulawy 52, 179–183, 2008, In English, summary in English.

Renata Komsta, Wojciech Łopuszyński

MULTIPLE PRIMARY TUMOURS IN A DOG. A CASE REPORT

The work reports a rare case of canine two primary malignant tumours concurrent with one benign tumour occurring within a single organism. Soft palate malignant melanoma with metastases to the regional lymph nodes and internal organs was classified as the index tumour, while thyroid carcinoma was defined as incidentaloma. The third tumour recognised was a large lipoma located in the abdominal cavity. The presented case proves that in the animal organism affected with a malignant tumour, other tumours may develop.

Publication: Bull. Vet. Inst. Pulawy 52, 481–484, 2008, In English, summary in English.

Anna Łojczyk-Szczepaniak, Maciej Orzelski, Anna Śmiech

CANINE CALCINOSIS CIRCUMSCRIPTA – RETROSPECTIVE STUDIES

The present study includes 18 cases of canine calcinosis circumscripta (CC). The objective of the research was to present the CC cases recognized in ten years in veterinary clinics in Lublin. The following factors were analyzed: dog age, breed and sex, the anatomical location of calcium salt deposits in each dog, a potential cause of the disorder and incidence of its remission after surgical treatment. The age of the dogs in the study varied from 6 months to 1 year (11 cases). Seven dogs were more than 2 years old. The dogs belonged to different breeds of both sexes, German Shepherd Dog prevailed (10 cases). The lesions occurred within limb joints (16 cases) and the ventral area of the tongue (2 cases). General clinic signs such as elevated body temperature and apathy were presented in one animal. In five cases local inflammation was observed. In three cases where tissue damage appeared in the affected region there occurred slight bleeding and exudates. None of the dogs had similar symptoms in the case history and none of them had surgical procedures performed in the affected region earlier. Only in one dog, calcinosis circumscripta was not the only disease reported. In three cases, lesions in the limb region occurred due to apparent physical damages. In the other cases no single cause was established. In eight cases radiographic evaluation was performed. In twelve cases the diagnosis relied on the histopathological examination of the surgically excised lesion; in one case fine needle aspiration cytology was employed. After surgery, recurrence of the disease was reported in three cases.

Publication: Medycyna Wet. (Lublin) 64, 1397–1400, 2008. In English, summary in English.

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Ref.: XIII Congress of the Polish Society of Veterinary Sciences, Olsztyn. 18–20 IX 2008.
Publication: Proceedings of the XIII Congress of the Polish Society of Veterinary Sciences, 90, 2008. In Polish.
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Publication: Magazyn Weterynaryjny 17, 1058–1060, 2008. In Polish.

KOMSTA R., DĘBIAK P., ŁOJSZCZYK-SZCZEPANIAK A.: Elbow dysplasia in dogs – radiographic evaluation. (Dysplazja stawu łokciowego u psów – ocena radiologiczna).

Publication: Magazyn Wet. 17, 762–764, 2008. In Polish.

ŁOJSZCZYK-SZCZEPANIAK A., DĘBIAK P.: Diaphragmatic hernia diagnosis in dogs and cats. (Rozpoznanie przepuklin przeponowych u psów i kotów).

Publication: Annales UMCS (Lublin), sectio DD, 63 (4), 8–15, 2008. In Polish, summary in English.

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Part I. (Problemy techniczne w procesie wykonywania zdjęć RTG. Część I).

Publication: Magazyn Wet. 17, 787–789, 2008. In Polish.

DEPARTMENT OF EPIZOOTIOLOGY AND CLINIC OF INFECTIOUS DISEASES

Głęboka 30, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Lukasz Adaszek, Jacek Kutrzuba, Jerzy Ziętek, Stanisław Winiarczyk,
Renata Szewerniak

INTERFERON IN THE THERAPY OF FELINE LEUKEMIA – CLINICAL REPORTS

Interferon w terapii białaczki kotów – przypadki kliniczne

The aim of this study was to evaluate the usefulness of interferon in feline leucaemia therapy. The examinations were done on 3 cats, males, 1,5, 9 and 11 years old, infected with FeLV, showing various clinical signs. The diagnose of feline leucaemia was based on the results of Speed immunochomatogaphic tests. In the therapy of sic animal interferon omega was administrated s.c. once daily through 5 consecutive days in a dose 1 MU/ kg b.w; in three separated cycles beginning on day 0, and than on day 14 and 60. In a care therapy antibiotics, antiinflammatory drugs and vitamins were applied. After therapy with interferon all clinical signs observed in the infected cats disappeared. The results of hematological examinations did not show any abnormality. A few month clinical observations of diseased animals did not reveal any disorders of their health.

Publication: Essentia Vet. 2, 5–9, 2008, fig. 3. In Polish, summary in English.

Łukasz Adaszek, Wojciech Łopuszyński, Anna Łojczyk-Szczepaniak,
Stanisław Winiarczyk, Jacek Kutrzuba

DIAGNOSIS OF PANCREATITIS CHRONICA IN THE DOG – CLINICAL REPORT

Rozpoznanie przewlekłego zapalenia trzustki u psa – przypadek kliniczny

The paper describes a diagnosis of pancreatitis chronica in 11 year old bitch with symptoms of vomits, diarrhea and anorexia. Clinical, hematological, biochemical, RTG and USG examinations were done. Hematological and biochemical examinations of blood and serum revealed leucocytosis and increase of total bilirubine level as well as of AST, ALT, AP, amylase and lipase activity. Enlarged pancreas was observed in USG images. After therapy with ESPES, Biovetalgin, and Neo-Pancreatinum improvement of status present of this dog was observed. However after 3 weeks the symptoms of the disease returned. The dog was euthanased and the anatomopathological examination was done. Histopathological examination of pancreas recognized – chronic relapsing pancreatitis.

Publication: Życie Wet. 83, 136–139, 2008, fig. 6, tab.1. In Polish, summary in English.

Łukasz Adaszek, Janina Łukaszewska, Stanisław Winiarczyk, Maciej Kunkel

THE FIRST CASE OF FELINE BABESIOSIS IN POLAND

Pierwszy przypadek babeszjozy u kota w Polsce

The aim of his study was to present a clinical course of babesiosis in a 10 year old queen cat with the symptoms of weakness, anemia, fever and hematuria. The hematological, biochemical and molecular examinations were done. Hematological examination revealed anemia, drop of hematocrit level and thrombocytopenia. In blood smears a small inclusion bodies inside erythrocytes similar to *B. canis* merozoites were observed. PCR reaction displayed the presence of genetic material of *Babesia* spp. which showed 87% homology with *Babesia felis* and 95% with *Babesia canis*. The therapy included imidocarb dipropionate in the dose of 5 mg/kg. a total of 4 injections administered at 14-day-intervals resulted in full recovery of affected animal. On the basis of the results of hematological and molecular examinations and efficiency of the therapy we conclude, that in this case the etiological factor of the disease in queen was *Babesia protozoa* infection.

Publication: Życie Wet. 83, 668–671, 2008, fig. 2, tab. 2. In Polish, summary in English.

Lukasz Adaszek, Stanisław Winiarczyk

MOLECULAR CHARACTERIZATION OF *Babesia canis* ISOLATES FROM NATURALLY INFECTED DOGS IN POLAND

Babesia canis has generally been considered the only large *Babesia* to infect dogs. In this study, we used PCR to detect and characterize *B. canis canis* isolated from naturally infected dogs in Poland by amplifying and sequencing a portion of the 18S ribosomal RNA (rRNA) gene. Venous blood samples were collected from 76 *Babesia*-symptomatic dogs. A 559-bp fragment of the *B. canis canis* 18S rRNA gene was amplified by PCR. The PCR products were then digested with HincII restriction enzyme, and isolates were classified according to whether they were cut (group A) or not (group B) by this endonuclease. Sequencing of the PCR products from the isolates led to the identification of seven sequence variants (four in group A, and three in group B). Sequences were compared with GenBank sequences, and alignments showed that all *B. canis canis* isolates from Europe may be classified into groups A or B as defined in our study.

Publication: Vet. Parasitol. 152, 235–241, 2008, fig 4, tab. 5. In English, summary in English.

Lukasz Adaszek, Stanisław Winiarczyk

BABESIOSIS IN A HORSE

Przypadek babeszjozy konia

The paper describes a case of babesiosis in a horse in Poland. It was a 2-year old stallion with symptoms of fever, anemia, loss of appetite and muscles weakness. From the animal, the blood samples were collected for the standard hematological and biochemical examinations, serological examination for *Borrelia* and molecular tests for *Babesia* spp. and *Ehrlichia* spp. The results of hematological examinations revealed low level of hemoglobin (11 g/dl), low level of hematocrit (28 %), thrombocytopenia (145 thousand/mm³), and increase of total bilirubine level which are characteristic of hemolytic anemia. In PCR reaction, with primers GF2 and GR2 the fragment of *Babesia* spp, 18S RNA gene with a length of 577 bp was detected. The sequence showed 96% homology with *Babesia equi* partial sequence of 18S RNA gene with the GeneBank access number Z15105. On the basis of molecular examinations results and efficiency of imidocarb in a dose 2 ml/100 kg, and kanamycin in a dose of 10 mg/kg therapy the diagnose of babesiosis in horse was established. Control PCR examination of the

horse blood taken 14 days after therapy completion did not reveal the genetic material of *Babesia*. Full recovery of affected animal was observed.

Publication: Medycyna Wet. (Lublin) 64, 1317–1320, 2008, fig.1, tab.3. In Polish, summary in English.

Łukasz Adaszek, Stanisław Winiarczyk, Jacek Kutrzuba, Andrzej Puchalski,
Piotr Dębiak

BORRELIOSIS IN DOGS FROM THE LUBELSKIE VOIEVODSHIP

Przypadki boreliozy u psów na Lubelszczyźnie

The aim of this study was to recognize an etiological factor of diseases with symptoms of lameness and subcutaneous tissues oedema, which occurred in 2 dogs after invasions of ticks. Clinical examinations and laboratory tests for babesiosis, ehrlichiosis and borreliosis were done. ELISA tests revealed in both sera samples high titer of antibodies anti-*Borrelia*. The Western blott method confirmed, that the antibodies reacted most strongly with the antigens of spirochetes: 30, 33, 44, 56, 64, 68 kDa. The results of serological examinations and the reaction of animals to tetracycline therapy showed, that the etiological factor of the disease were bacteria *Borrelia burgdorferi*.

Publication: Życie Wet. 83, 311–314, 2008, fig. 3, tab. 1. In Polish, summary in English.

Łukasz Adaszek, Stanisław Winiarczyk, Andrzej Puchalski

THE SEROLOGICAL INVESTIGATIONS TOWARDS BORRELIOSIS IN POPULATIONS OF DOGS IN LUBELSKIE VOIVODSHIP

Badania serologiczne w kierunku boreliozy psów na Lubelszczyźnie

The aim of this paper was the detection of specific antibodies anti-*Borrelia* in the sera of 208 dogs from the area of Lublin Voivodship. ELISA tests, and Western blott were conducted. In ELISA tests, 3,85% sera of dogs were positive for spirochetes. All sera that were positive in ELISA for spirochetes (8 samples) were examined additionally in Western blott method for the presence of antibodies against *Borrelia afzelii*. In all 8 sera, specific antibodies against *Borrelia* were detected. In all cases immunoglobins IgG reacted strongly with antigens: 30, 33, 44, 56, 64, 68 kDa of *B. afzelii*. Low seroprevalence against borreliosis in the

examined dogs indicates that the area of Lubelskie Voivodship is not endemic place of Lyme disease, however the veterinarians should consider borreliosis in differential diagnosis of tick-borne diseases in dogs in this region.

Publication: Annales UMCS (Lublin) sectio DD., 63, 1–7, 2008, fig. 1. In Polish, summary in English.

Krzysztof Buczek , Mariusz Chełmiński

EVALUATION OF EFFECTIVENESS OF BIOLOGICAL AND SYNTHETIC IMMUNOSTIMULATORS FOR THE HONEY BEE BY A PROTECTION TEST

Ocena efektywności immunostymulatorów biologicznych i syntetycznych u pszczoły miodnej na podstawie testu działania ochronnego

Protection test is a very valuable tool for evaluation of effectiveness of biological and synthetic immunostimulators for the honey bee (*Apis mellifera* L.). Chitosan, extract of *Echinacea purpurea*, levamisole and clotrimazole protected *Escherichia coli* D31 non-induced worker bees well against aerosol infection of *Pseudomonas aeruginosa* isolated from septicaemic bees. The best protective effects were noted for chitosan (Chitosal – Apis Liquid, Vet-Agro Sp.z o.o. Lublin) and for Extractum Echinacea aqua siccum (Phytopharm) in *Escherichia coli* D31 induced bees exposed to live cells of *Pseudomonas aeruginosa* in an aerosol. These two preparations of natural origin, may be used in the honey bee colonies as potent stimulators and modulators of immune response.

Publication: Annales UMCS (Lublin) sectio DD 63, 14–20, 2008. In Polish, summary in English.

Krzysztof Buczek, Maria Teresa Zoń

EVALUATION OF HAEMOCYTIC IMMUNE PARAMETERS OF DIFFERENT LINEAGES OF HONEY BEE (*Apis mellifera* L.)

Ocena parametrów odporności komórkowej różnych linii pszczoły miodnej (*Apis mellifera* L.)

Haemocytic immune parameters of four different lineages of honey bee (*Apis mellifera* L.): augustowska (MA), northern (PN), Asta and Norwegian (NRQ) were examined. The lines MA, PN and Asta were under the state control of the bee genome protection while for NRQ there was realized a programme of genetic improving. The following haemocytic immune responses were evaluated: phagocytic index and the number of haemocytes active in phagocytosis (Wright's number). The examined parameters for the four lines of non-induced

bees did not differ significantly. However, the haemocytic immune response was significantly stronger in immunologically induced worker bees of augustowska and Asta lines in comparison to the worker bees of northern and Norwegian lines. The values of phagocytic index and Wright's number differed significantly.

Publication: Annales UMCS (Lublin) sectio DD 63, 1–7, 2008. In Polish, summary in English.

Łukasz Jarosz, Katarzyna Wojcicka-Lorenowicz, Barbara Majer-Dziedzic,
Krzysztof Kostro, Mariusz Mikołajczak

**CLINICAL OBSERVATIONS ON THE EFFICACY OF ISOPRIVET
FOR UNSPECIFIC IMMUNOPROPHYLACTIC IN STREPTOCOCCOSIS OF PIGS**

Obserwacje kliniczne nad efektywnością preparatu Isoprivet
w immunoprofilaktyce nieswoistej streptokokozy świń

The aim of the studies was to evaluate the effectiveness of Isoprivet for control of endemic streptococcosis in a pig farm. It was found that Isoprivet used in immunostimulatory doses in sows at the last weeks of pregnancy improved the health state of their progeny and prevents the development of septic form of streptococcus's in suckling and in older piglets. This unspecific immunostimulation enables to achieve better breeding effects. Moreover, Isoprivet used in piglets recovered from a pulmonary form of streptococcus caused favorable convalescence, pointing to high efficacy of unspecific immunostimulation in restoring of disturbed mechanisms of unspecific immune responses in pigs.

Publication: Annales UMCS (Lublin) sectio DD 63, 16–23, 2008, fig. 2. In Polish, summary in English.

Mirosław Karpiński, Łukasz Adaszek, Leszek Drozd, Stanisław Winiarczyk,
Piotr Czyżowski

**RESTRICTION FRAGMENT LENGTH POLYMORPHISM OF THE MITOCHONDRIAL DNA
IN ROE DEER (*Capreolus capreolus*)**

Polimorfizm długości fragmentów restrykcyjnych mitochondrialnego DNA u sarny
(*Capreolus capreolus*)

The aim of this study was to estimate the basic genetic parameters of the studied subpopulation of roe deer (*Capreolus capreolus*) based on restriction fragment length polymorphism of the mitochondrial DNA. The material for investigation was collected from two populations of roe deer (*Capreolus capreo-*

lus) coming from The Forest Inspectorate Białobrzegi and Zwierzyniec. To determine the genetic differences between these two populations of roe deer, the PCR analysis with the primer pair L14735, H15149 was applied and the comparison of nucleotide sequences of the obtained amplicons of 464 pair in length was made. At the same time the restriction fragments (RFLP) were analysed statistically for three loci using endonucleases *HaeIII*, *HinII*, *SspI* in both studied wild ruminant populations. From the allele frequencies the following were estimated: heterozygosity-H (0,533–0,764), polymorphic information content-PIC (0,375–0,661) and standard distance D_s (0,0094). Using the nucleotide sequences there was developed a phylogenetic tree illustrating genetic diversity within the roe deer populations under investigation. The researches on allele frequencies obtained after the RFLP method proved locus *SspI* to be the most polymorphic among the three loci selected for genetic variation estimation in roe deer.

Publication: Annales UMCS (Lublin) sectio DD 63, 24–32, 2008, fig. 4, tab. 1. In Polish, summary in English.

Krzysztof Kostro, Łukasz Jarosz, Barbara Majer-Dziedzic, Jerzy Ziętek

**THE EFFICACY ON UNSPECIFIC IMMUNOSTIMULATION IN THERAPY
OF THE UPPER RESPIRATORY TRACT SYNDROME IN CATS**

Efektywność immunostymulacji nieswoistej w leczeniu zespołu zakażeń
górných dróg oddechowych u kotów

The objective of the studies was evaluation of the effects of Isoprivet on the percentage of TCD4 and TCD8 lymphocytes in cats with the feline respiratory disease complex (FRDC) and therapy of FRDC. It was found that Isoprivet used three times at 2 or 7 day intervals in cats with FRDC appeared to be a potent stimulator of cellular immune response. This activity was evaluated by flow cytometry on the basis of a percentage of CD4 and CD8 molecules on T lymphocytes and their relative proportions. Good therapeutic effect and shortening of convalescence was obtained in cats with FRDC after three subcutaneous injection of Isoprivet. Moreover, Isoprivet prevented the open disease in cats exposed to contacts with FRDC cats. It may be used with success in prophylactic and therapy in cats with the upper respiratory tract infection especially in endemics of FRDC in larger breeds or larger concentration of cats.

Publication: Medycyna Wet. (Lublin) 64, 1150–1154, 2008, fig. 4. In Polish, summary in English.

Janina Łukaszewska, Łukasz Adaszek, Stanisław Winiarczyk

**CHANGES IN HEMATOLOGICAL EXAMINATIONS IN THE COURSE
OF GRANULOCYTIC ANAPLASMOSIS IN DOGS AND HORSES**

Obraz krwi w przebiegu anaplazmozy granulocytarnej u psów i koni

Anaplasma phagocytophilum is intracellular bacteria with tropism for hemopoietic cells. Anaplasmosis is a tick-borne disease which occurs in animals as well as in human. The main vector of this disease in Europe is *Ixodes ricinus* and its reservoir – wild and domestic animals. The symptoms of anaplasmosis: apathy, fever, bleeding of mucosal, are not specific. Occasional nervous symptoms and lameness may be observed. In hematological examinations thrombocytopenia is recognized.

Publication: Życie Wet. 83, 827–831, 2008, fig. 10. In Polish, summary in English.

Asteria Štefančíková, Łukasz Adaszek, Branislav Peťko, Stanisław Winiarczyk,
Vladimir Dudiňák

**SEROLOGICAL AND IMMUNOCHEMICAL EVIDENCE OF *Borrelia burgdorferi* SENSU
LATO IN HORSES AND CATTLE FROM POLAND
AND DIAGNOSTIC PROBLEMS OF LYME BORRELIOSIS**

Data presented in this study focuses on the serological and immunochemical detection of agent *Borrelia burgdorferi* sensu lato in horses and cattle from different voivodships of Poland. We also discussed some diagnostic problems of Lyme borreliosis resulting from, in addition to other factors, genetic and geographical heterogeneity isolates *B. burgdorferi* s.l. used as antigens. Using ELISA from 395 sera of horses the total mean seroprevalence for anti-*Borrelia* IgG antibodies 25.6% was observed. In the respective years, significant differences in the mean seroprevalence were not recorded. In the voivodships, the total mean seroprevalence and mean seroprevalence for the respective years varied from 16.6 to 66.6%. An analysis of seroprevalence depending on the age showed a significant difference between 0–2 year-old horses in comparing to older horses. The total seroprevalence in the set of 98 serum samples was lower with strain *B. garinii* (25.5%) comparing to mixture *B. burgdorferi* sensu stricto with *B. afzelii* (36.7%) and *B. afzelii* (42.8%). The highest correlation of findings was reached comparing the strains of *B. afzelii* (South Poland) and mixture of *B. burgdorferi* s.s. + *B. afzelii* (East Slovakia). Lower correlation was observed between *B. garinii* and mixture of *B. burgdorferi* s.s. + *B. afzelii*. On the contrary, the lowest correlation of findings was observed between the Slovak strain

of *B. garinii* and Polish *B. afzelii*. In a group of 26 cow sera, the mean seroprevalence for anti-*Borrelia* IgG antibodies was 26.9%. In the remaining clinical sings, the seroprevalence was 28.5–66.6%. In Western blot out of 25 examined sera of horses 15 (60.0%) were positive, out of 6 cows 5 (83.3%) were positive (2 lameness, 2 phlebitis, 1 clinically healthy). The horses and cows sera recognised proteins: 93 (MEP)-, 83-, 75-, 66-, 55-, 43-, 45-, 41 (flagellin)-, 39-, 34-, 35 (OspB) and 25-, 28 (OspC)-kDa.

These results alert veterinarians to take into account the aetiology of Lyme disease in differential diagnoses.

Publication: Ann. Agric. Environ. Med. 15, 37–43, 2008, fig.4, tab.5. In English, summary in English.

Katarzyna Wojcicka-Lorenowicz, Krzysztof Kostro

**FLOW CYTOMETRY EVALUATION OF PHAGOCYtic ACTIVITY
AND OXYGEN METABOLISM OF GRANULOCYTES IN PERIPHERAL BLOOD
OF RABBITS WITH NATURAL TRICHOPHYTOSIS**

Cytometric evaluation of blood of rabbits naturally affected with trichophytosis showed successive and significant increase in the percentage of phagocytic cells; the highest level of phagocytes was found on 42 d of observation. However, the analysis of phagocytic activity, oxygen metabolism (% of activated cells), and mean channel of fluorescence of granulocytes demonstrated a significant decrease on 14 d and the highest mean values were obtained on 42 d of observation. An increase in phagocytic activity and oxygen metabolism of granulocytes on 42 d were observed during spontaneous recovery. The results of the presented study indicated that the non-specific cell-mediated immunity contributed to the elimination of the infection.

Publication: Bull. Vet. Inst. Pulawy 52, 555–560, 2008, fig. 4. In English, summary in English.

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Ref.: XIII Congress of the Polish Society of Veterinary Sciences „From science to practice”. Olsztyn, 18–20 IX 2008.

Publication: *Proceedings of the XIII Congress of Polish Society of Veterinary Sciences „From science to practice”*, 236, 2008. In Polish.

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Publication: *Weterynaria w praktyce* 5, 38–42, 2008. In Polish, summary in English.

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Publication: *Życie Wet.* 83, 741–744, 2008. In Polish, summary in English.

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Publication: *Weterynaria w praktyce*, 5, 52–54, 2008. In Polish, summary in English.

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Publication: *Weterynaria w praktyce* 5, 60–65, 2008. In Polish, summary in English.

DEPARTMENT OF FOOD HYGIENE OF ANIMAL ORIGIN

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RESEARCH STUDIES (SUMMARIES)

Zbigniew Belkot, Elżbieta Pełczyńska

THE INFLUENCE OF THE CHILLING SYSTEM ON BACTERIAL CONTAMINATION AND THE QUALITY OF SLAUGHTER CHICKEN CARCASSES

Wpływ systemu chłodzenia na zanieczyszczenie bakteryjne i cechy jakościowe
tuszek kurcząt rzeźnych

The aim of the research was to determine the quantity of nonspecific bacteria contamination, the presence of pathogenic bacteria, as well as the sensory qualities of slaughter chicken carcasses with regards to the implemented chilling system. The investigations were conducted on carcasses of broiler chickens, aged 6–8 weeks and a body weight of 1.2–2.5 kg, that had been chilled in three technologically different systems: air, immersion and evaporative chilling. The temperature of the carcasses was taken before and after chilling, the bacterial contamination was measured (total count of aerobic bacteria, total number of coliform, psychrotropic and proteolytic bacteria), as well as a sensory analysis (appearance and odor) was conducted.

The temperature of the carcasses after chilling was 4.28°C, 6.97°C after immersion chilling, and 4.39°C after evaporative chilling. This data indicates that none of the mentioned systems lowered the temperature of the carcasses to that required by the regulatory limits of 4°C. According to the authors' research the total count of aerobic bacteria in the case of carcasses chilled by air was $2.6 \cdot 10^4$ jtk per 1 g, chilled by immersion, $3.9 \cdot 10^4$ jtk, through evaporative chilling,

$2.7 \cdot 10^4$ jtk /g. The bacterial contamination of carcasses chilled by water was significantly higher in comparison to both remaining chilling systems. The total number of coliforms in the case of carcasses chilled by air averaged $1.7 \cdot 10^2$ jtk/g, chilled by water $2.5 \cdot 10^2$ jtk/g, while through evaporative chilling $1.9 \cdot 10^2$ jtk/g. Only among carcasses chilled by immersion did the chilling system significantly differ the bacterial contamination of the coliform group from both remaining systems; it was higher in the case of immersion chilling. Air chilling and evaporative chilling did not differ among themselves in relation to this group of bacteria. The total number of psychotropic bacteria in the case of carcasses chilled by air averaged 10^3 jtk/g, chilled by immersion $1.2 \cdot 10^4$ jtk, chilled by the evaporative system $6 \cdot 10^3$ jtk/g. The chilling system significantly differed the contamination of the carcasses in the mentioned bacterial group; it was highest in the case of immersion chilling, and lowest with air chilling. The total number of proteolytic bacteria in the case of carcasses chilled by air averaged $1.8 \cdot 10^3$ jtk/g, chilled by water $2.9 \cdot 10^3$ jtk/g, while through evaporative chilling $3.1 \cdot 10^3$ jtk/g. The chilling system significantly differed the contamination of the carcasses only in the case of those chilled by air from the contamination confirmed after chilling by immersion as well as evaporative chilling. The level of proteolytic bacteria in the carcasses chilled in the latter two systems was similar. *Salmonella* rods occurred in the muscle tissue of chickens chilled in all systems. In the investigations, *Salmonella* was isolated most often in carcasses from immersion chilling (27% of the general sample), after which in those from evaporative chilling (20%), and least often after air chilling alone (13%). However, the chilling system did not affect the sensory qualities of the carcasses; their appearance and odor and from the perspective of sensory evaluation all the examined systems gave a high quality product.

In the process of chilling poultry the highest quality chicken carcasses are gained from applying air chilling: the carcasses are relatively the best chilled and the least contaminated with nonspecific and pathogenic bacteria in comparison to those from immersion chilling and evaporative chilling. On the other hand the lowest quality product is gained from the immersion chilling of the carcasses, which are inadequately chilled and have the highest level of nonspecific and pathogenic bacteria in comparison to those from air and evaporative chilling. From the perspective of chilling, external water content and bacterial contamination, the quality of carcasses from evaporative chilling is lower in comparison to air chilling, but nonetheless higher than carcasses from immersion chilling.

The authors' research demonstrated that in none of the examined systems for chilling did the carcasses attain the prescribed regulatory temperature of 4°C , and so it would be recommended that correctional actions be taken in the examined plants in the HACCP system with regards to the chilling system, in order to

attain the required end temperatures for carcasses as they have been developed in the HACCP system for the poultry industry as the so called critical limit.

Publication: Medycyna Wet. (Lublin) 63, 1572–1575, 2008, tab. 5. In Polish, summary in English.

Krzysztof Szkucik, Renata Pyz-Łukasik

VARIABILITY OF SENSORY TRAITS OF RABBIT MEAT IN RELATION TO BREED AND PART OF CARCASS

Zmienność cech sensorycznych mięsa królików w zależności od rasy i części zasadniczej tuszki

The aim of the research was to determine chosen sensory traits of rabbit muscle tissue and their variability in relation to breed and the part of carcass. The research material comprised the carcasses of approximately 20-week-old rabbits. The evaluation concerned the carcasses of crossbreeds and a meat breed (French Lops). The entire carcass was evaluated in terms of its appearance and smell. The evaluation was performed directly after slaughter and after 24-hour cold storage. The juiciness, tenderness and general assessment of muscle tissue from the leg and saddle were established after 24 hours. The sensory analysis was performed by a 6-member commission with the use of an extended 5-point scale. Additional assessment of tenderness was carried out with the texture analyser TA.XTplus.

The muscle tissue of both the crossbreeds and French Lops was light pink, glossy and uniform on its entire surface. The smell was imperceptible or faint, characteristic of the breed. No significant differences in the appearance and smell of muscle tissue were observed after 24-hour cold storage. Juiciness and tenderness depended on a kind of muscles under examination; leg muscles received higher marks. In the general evaluation leg meat was also appraised more highly than that of the saddle. The juiciness, tenderness and general evaluation of French Lop meat were definitely lower as compared to crossbreeds; the differences were demonstrated by both the sensory evaluation and apparatus measurements.

Publication: Medycyna Wet. (Lublin) 64, 1426–1429, 2008, tab. 4. In Polish, summary in English.

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Publication: Proceedings of the XIII Congress of Polish Society of Veterinary Sciences, 327, 2008. In Polish.

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Publication: Proceedings of the XIII Congress of Polish Society of Veterinary Sciences, 350, 2008. In Polish.

DEPARTMENT OF PATHOLOGICAL ANATOMY

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RESEARCH STUDIES (SUMMARIES)

Jacek Piórkowski

ESTIMATION OF PATHOMORPHOLOGICAL SKIN CHANGES IN GUINEA PIGS AFTER ITRACONAZOLE TREATMENT DURING INFECTION WITH *Trichophyton mentagrophytes*

Ocena zmian patomorfologicznych skóry świnek morskich leczonych itraconazolem po zakażeniu grzybem *Trichophyton mentagrophytes*

The aim of the research was to investigate the possibility of using oral medicines for the treatment of animals with skin mycoses. The administration of oral azole antifungal Itraconazole was conducted on guinea pigs. In the light microscopy investigation during treatment of guinea pigs with Itraconazole, mycelium were not observed 4 days after the time of the administration of the drug, both in the stratum corneum of the epidermis and in hair sheaths. Neither was mycelium confirmed in the subcutaneous layer. Only parakeratose, hyperkeratose was observed, as well as a small degree of akantose. The investigation with the use scanning microscope made it possible to additionally affirm the presence of spherical forms accumulating drops of fat on the top of scraps which is characteristic for azole antifungals. The administration of oral azole antifungal causes the rapid regression of pathological changes in the deep layers of the skin. A therapy of this type can be useful in veterinary medicine.

Publication: Medycyna Wet. (Lublin) 64, 450–453, 2008, fig. 5. In Polish, summary in English.

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Ref.: XIII Congress of the Polish Society of Veterinary Sciences, 18–20 IX 2008 Olsztyn.
Publication: Proceedings of the XIII Congress of Polish Society of Veterinary Sciences, 173, 2008. In Polish.

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Publication: Essentia Vet. 1, 49–51, 2008. In Polish, summary in English.
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Publication: Essentia Vet. 2, 58–63, 2008, ryc. 3. In Polish, summary in English.

DEPARTMENT OF PRECLINICAL VETERINARY SCIENCE

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SUB-DEPARTMENT OF PATHOPHYSIOLOGY

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RESEARCH STUDIES (SUMMARIES)

Ewa Borzym, Ryszard Bobowiec, Urszula Kosior-Korzecka, Franco Martelli,
Artur Burmańczuk

DISTURBANCES OF COW OOCYTE MATURATION BY PHYTOESTROGENS

The aim of the study was to elucidate the influence of different phytoestrogens (PEs) such as isoflavones (represented by genistein), stilbens (represented by resveratrol (RES)), lignans (represented by enterodiol) and coumestans (represented by coumestrol) on the maturation process of isolated bovine oocytes. We assumed that their influence on a rate of oocyte growth and maturation would be related primarily to their estrogenic activity (isoflavones and coumestans are similar to the 17β estradiol- E_2 , the most potent oestrogen). Eighty to one hundred oocytes were cultured in 4 ml of the medium in six-well multidishes. Cumulus oocyte complexes (COCs) were matured at 39°C in humidified air containing 5% CO_2 for 24 hours. Four phytoestrogens were tested at two concentrations: 10 $\mu\text{g}/\text{ml}$ and 100 $\mu\text{g}/\text{ml}$. These results clearly show that there is no significant relation between PEs and the survival of cow oocytes. However, under

the influence of different PEs the expansion of oocytes was suppressed, especially when genistein and coumestrol were introduced into the culture medium. It was noted that the addition of the phytoestrogens into the medium decreased the rate of oocyte maturation. The highest increase of immature oocytes ($p \leq 0.05$) was noted after the addition of coumestrol (30.77%) and genistein (20%). The most pronounced suppression of oocyte maturation by genistein and coumestrol observed in our research indicates a direct relationship between potency of the estrogenic activity of particular PEs and oocyte maturation inhibition. From our studies it follows that PEs may disturb the conception and fertilisation rate in cow by prolonging cow oocyte maturation.

Publication: Medycyna Wet. (Lublin), 64, 1107–1111, 2008, fig. 5, tab. 1. In English, summary in English.

Urszula Kosior-Korzecka , Marco Ducci , Franco Martelli , Ryszard Bobowiec

LEPTIN INFLUENCES HISTIDINE DIPEPTIDES AND NITRIC OXIDE RELEASE FROM ANTERIOR PITUITARY CELLS OF SHEEP *IN VITRO*

Our previous results show that leptin, as well as nitric oxide (NO) and some antioxidants (histidine dipeptides – HDP), change the secretion and release of gonadotrophins from ovine pituitary cells *in vitro*. Both NO and HDP can modulate gonadotropin secretion by auto- and/or paracrine action. The objective of the present study was to analyse leptin effect on NO and HDP (3-methyl-L-histidine, carnosine and anserine) release from ovine pituitary *in vitro* and thus to check if these compounds can mediate leptin influence on gonadotropin secretion. Pituitary cells were cultured in McCoy 5A medium with GnRH ($4 \cdot 10^{-9}$ M/l) (positive control) or with GnRH and 10^{-10} – 10^{-5} M/l of *ro* leptin, respectively. Next, the media for NO and HDP analysis were collected. Nitrite (NO_2^-) as an indicator of NO production were measured by Griess method, whereas HDP by HPLC. The influence of leptin on NO release was dependent on time and leptin dose. Leptin in concentration of 10^{-8} – 10^{-6} M/l caused significant ($P \leq 0.05$) augmentation in NO in the culture medium, whereas in the concentration of 10^{-5} M/l it reduced ($P \leq 0.05$) NO release. The level of 3-methyl-L-histidine and anserine, but not carnosine, was significantly lower in the culture with 10^{-8} – 10^{-7} M/l of leptin.

Publication: J. Physiol. Pharmacol. 59, 9, 19–27, 2008, fig. 5. In English, summary in English.

Marta Wójcik , Ryszard Bobowiec, Franco Martelli

EFFECT OF CAROTENOIDS ON *IN VITRO* PROLIFERATION AND DIFFERENTIATION OF OVAL CELLS DURING NEOPLASTIC AND NON-NEOPLASTIC LIVER INJURIES IN RATS

The goal of this study was to investigate the effects of β -caroten and astaxanthin (ASX) – carotenoid without provitamin A activity on the proliferation and differentiation of rat oval cells (OC) in vitro. Oval cells were isolated from two groups of animals: I – partial hepatectomised (PH) and II – diethylnitrosamine (DEN) treated rats. At various time points, cell lysates were separated by PAGE. For immunodetection primary antibodies against CD-34, Ck19 and albumin were used. Medium concentration of fibrinogen and haptoglobin was measured. Mitochondrial competence of cells was expressed as the proliferation index. In comparison to HP- and DEN-obtained oval cells cultured without carotenoids, the addition of β -caroten and ASX increased albumin expression during the experimental period. The same condition did not reveal CK19 expression. CD34 expressed by oval cells was detected up to the 5th week of β -caroten and ASX absence in the medium, β -carotene addition resulted in a decrease of the proliferative activity of OC, with significant changes in 48 h, the 5th and 15th week of incubation. ASX ($p \leq 0.05$) inhibited the proliferation, especially in 24 h and 5th week of cell culture. In respect to haptoglobin concentration, its maximum value after the 10th week was observed. The fibrinogen level obtained from DEN-oval cells incubated with β -caroten elevated from $480 \pm 6.87 \mu\text{g/ml}$ after 24 h to $5520 \pm 34,56 \mu\text{g/ml}$ after the 15th week. In a condition without carotenoids, fibrinogen concentration did not exceed $2280 \pm 31.5 \mu\text{g/ml}$ after the 15th week of cell culture.

Publication: J. Physiol. Pharmacol. 59, suppl. 2, 203–213, 2008, fig. 5. In English, summary in English.

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Publication: J. Physiol. Pharmacol. 59, suppl. 1, 173, 2008. In English.

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Publication: J. Physiol. Pharmacol. 59, suppl. 1, 181, 2008. In English.
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Publication: J. Physiol. Pharmacol., 59, suppl. 1, 300, 2008. In English.
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Publication: Proceedings of the XIII International Conference Student Scientific Circle, errata, 2008. In Polish.
- WESSELY-SZPONDER J., BOBOWIEC R.: Assessment of neutrophil *in vitro* action in relation to estrus cycle in sows. (Ocena aktywności neutrofilii w warunkach *in vitro* w zależności od fazy cyklu rujowego u sów).
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 Ref.: XXIV Congress of the Polish Physiological Society, Lublin, 11–13 IX 2008.
Publication: J. Physiol. Pharmacol. 59, suppl. 1, 233, 2008. In English.
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Publication: J. Physiol. Pharmacol. 59, suppl. 1, 234, 2008. In English.

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Publication: Proceedings of the XIII Congress of Polish Society of Veterinary Sciences, Olsztyn, 443, 2008. In Polish.

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Publication: Magazyn Wet. (Lublin) 17, 136, 800–805, 2008. In Polish.

BOBOWIEC R., KOSIOR-KORZECKA U.: Follicular cysts in females of different species of animals. Part II. (Torbiele pęcherzykowe u samic różnych gatunków. Cz. II).
Publication: Magazyn Wet. (Lublin) 17, 140, 1254–1257, 2008. In Polish.

SUB-DEPARTMENT OF PHARMACOLOGY

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RESEARCH STUDIES (SUMMARIES)

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

PHARMACOKINETICS OF TRAMADOL IN DOGS

Farmacocinesi del tramadolo nel cane.

Valutazione dopo somministrazione orale singola di compresse a rilascio prolungato

Tramadol displays a weak affinity for the μ and δ -opioid receptors, and weaker affinity for the κ -subtype, it also interferes with the neuronal release and reuptake of serotonin and norepinephrine in the descending inhibitory pathways. The metabolism of this drug has been investigated in different animals (rats, mice, syrian hamsters, guinea pigs, rabbits and dogs) and humans; similar metabolites are produced but in different amounts. The aim of the present study is to evaluate the pharmacokinetic of T and its major metabolites M1, M2 and M5 after single oral administration of a SR tablet (100 mg/tab) in the dog. T plasma concentration was quantitatively detected in three dogs. M1 was quantized only in one dog while M2 and M5 were quantized in all the dogs. T showed median values of C_{max} , T max and $T_{1/2}$ of 0.04 (0.17–0.02) $\mu\text{g ml}^{-1}$, 3 (4–2) and 1.88 (2.211–1.435) hours, respectively. M5 showed median values of C_{max} , T max and $T_{1/2}$ of 0.1 (0.19–0.09) $\mu\text{g ml}^{-1}$, 2 (3–1) and 4.230 (6.583–1.847) hours, respectively. M2 showed median values of C_{max} , T max and $T_{1/2}$ of 0.22 (0.330–0.080) $\mu\text{g ml}^{-1}$, 4 (7–3) and 4.487 (6.395–1.563) hours, respectively. In conclusion, the present findings suggest that T SR formulation could not have suitable pharmacokinetic characteristics to be administered once-a-day as an effective and safe treatment of pain in the dog.

Publication: Obiettivi and Documenti Veterinari 2, XXIX, 49–55, 2008, fig. 3. tab. 1. In Italian, summary in English.

Irena M. Choma, Cezary Kowalski, Roman Lodkowski, Artur Burmańczuk,
Iwona Komaniecka

**TLC-DB AS AN ALTERNATIVE TO THE HPLC METHOD IN THE DETERMINATION OF
CEFACETRIL RESIDUES IN COW'S MILK**

Cephalosporins, relatively new antibiotics related to penicillins, are widely used in the treatment of both human and veterinary diseases because their broad spectrum of antibacterial activity and good pharmacokinetic properties. Cefacetil, belonging to cephalosporins, is commonly used in treating bovine mastitis. In the present paper, cefacetil excretion with milk was examined by means of the TLC-DB and HPLC method. Thin-layer chromatography-direct bioautography is a technique which combines TLC with microbiological detection. Semi-quantitative determination of cefacetil in milk by tlc-DB was compared with quantitative HPLC analysis. An exponential relationship was proposed for calibration curves in bioautography.

Publication: J. Liq. Chromatogr.R.T., 31,1903–1912, fig. 6, tab.1. In English, summary in English.

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Publication: Materials of LXII S.I.S. Vet. Congress, San Benedetto del Tronto, Italy, 102, 2008. In English.

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Publication: Magazyn Wet., 18, 138, 48–50, 2008. In Polish.

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Publication: Magazyn Wet., 17, 134, 528–530, 2008. In Polish.

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Publication: Państwowe Wydawnictwo Rolnicze i Leśne. Warszawa, 741, 2008. In Polish.

SUB-DEPARTMENT OF VETERINARY TOXYCOLOGY AND ENVIRONMENT PROTECTION

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RESEARCH STUDIES (SUMMARIES)

Agnieszka Chałabis-Mazurek, Grażyna Wałkuska

THE INFLUENCE OF DIFFERENT FORMS AND DOSES OF SELENIUM FOR ITS CONCENTRATION IN SERUM OF LAMBS

Wpływ różnych dawek i form selenu na jego zawartość w surowicy krwi jagniąt

The studies were carried out in two stages. The aim of first stage of studies was to assess a selenium level in feed for lambs, as well as in milk and serum of their dams. The objective of the second stage was to evaluate the impact of two different doses and sources of selenium (sodium selenite or Se enriched yeast) on its concentration in lamb serum. The experiment was conducted on 64 lambs divided into four groups, 16 animals each: group I, the control group – received no additional selenium, group II – 0,1 mg Se/day/animal (Se enriched yeast), group III – 0,2 mg Se/day/animal (Se enriched yeast), group IV – received 0,2 mg Se/day/animal (Na_2SeO_3). The concentration of Se in feed, milk and serum was determined by means of an atomic absorption spectrometer SpektrAA 220Z with electrothermal atomization and Zeeman background correction (by Varian). Low concentration of selenium in soil, plants and food would suggest a deficiency of this mineral. These results indicate that low Se levels in serum of lambs generally reflect a Se level dietary. The results of this study demonstrate that Se from organic sources was markedly more available to lambs than selenium from mineral sources.

Publication: Medycyna Wet. (Lublin) 64, 1125–1128, 2008, tab. 3. In Polish, summary in English.

Agnieszka Chałabis-Mazurek, Grażyna Wałkuska

**THE INFLUENCE OF DIFFERENT FORMS OF SELENIUM ON ITS RETENTION
IN SELECTED TISSUES OF LAMBS**

Wpływ różnych form selenu na jego retencję w wybranych tkankach jagniąt

The objective of the study was to evaluate the efficacy of two selenium sources (sodium selenite or Se enriched yeast) in terms of its concentration in the liver, heart, kidneys and skeletal muscles of lambs.

The experiment was conducted on 48 lambs divided into 3 groups, 16 animals each: group I, control group – received no additional selenium, group II – 0,2 mg Se/day/animal (Se enriched yeast), group III – 0,2 mg Se/day/animal (Na_2SeO_3) for 1 month.

Tissue samples for analyses were collected after slaughter, after 2 and 4 weeks of the oral administration of selenium and in 6 and 8 week of treatment (after the end of selenium supplementation). Selenium was determined in the samples after microwave mineralization using atomic absorption spectrometer SpektrAA 220Z with electrothermal atomization and Zeeman background correction, Varian.

The research results revealed that selenium supplement has increased a selenium concentration in lamb tissues and organs. The best performance was observed in the lamb group fed the yeast selenium improved diet. The highest selenium level was determined in lamb kidneys and liver, while the lowest in the heart. The selenium content in lamb tissues and organs recorded in the final stage of experiment indicated a deficit of this element in organism. Therefore, it is recommended to improve lamb diet with a selenium dose established on the basis of the selenium status of the animal organism as well as to determine a selenium content in the sources of this element.

Publication: Medycyna Wet. (Lublin) 64, 1324–1326, 2008, tab. 5. In Polish, summary in English.

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Publication: *Proceedings of the symposium „Trace elements in the environment – ecological and analytical problems. Trace elements in nutritional chain”*, 57–58, 2008. In Polish.

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Publication: *Proceedings of the conference „Local animal breeds as the basis of regional food and important element of landscape”*, 49, 2008. In Polish.

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Ref.: X Symposium „Trace elements in the environment – ecological and analytical problems. Trace elements in nutritional chain”, 11–14 V 2008, Koszalin–Mielno, Poland.

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