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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 2005

Structure

Veterinary Medicine Faculty belongs to one of five Faculties of the Agricultural University. At present, this Faculty consists of 1 Institute, 8 Departments. The Faculty is entitled to confer scientific degrees: i.e. the degree of Doctor of Veterinary Science and the second, a higher one Doctor habilitated.

Staff of Faculty

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

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

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

Professors

Prof. extraordin. Dr. habil. Ryszard Bobowiec
Prof. extraordin. Dr. habil. Regina Cybulska
Prof. extraordin. Dr. habil. Ryszard Eustachiewicz
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Prof. ordin. Dr. habil. Stanisław Flieger
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Prof. extraordin. Dr. habil. Adam Stec
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Prof. extraordin. Dr. habil. Andrzej Wernicki
Prof. extraordin. Dr. habil. Stanisław Winiarczyk
Prof. extraordin. Dr. habil. Zygmunt Wrona
Prof. Dr. habil. Grażyna Ziółkowska
Dr. habil. Zbigniew Boratyński
Dr. habil. Wojciech Cybulski
Dr. habil. Jadwiga Jaworska-Adamu
Dr. habil. Leszek Krakowski
Dr. habil. Hanna Lutnicka
Dr. habil. Barbara Majer-Dziedzic
Dr. habil. Zygmunt Nowakowski
Dr. habil. Krzysztof Szkucik
Dr. habil. Grażyna Wałkuska

Assistants, adjuncts and lecturers – 82

Technicians – 58

Received the degree of Doctor of Veterinary Science – 16

Received the degree of Doctor habil. –

Students – 970

Received the diploma of veterinary surgeon – 134

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

Altogether didactic	hours
General specific and professional subject	3885
Optional subject	150
Clinical practices	315
Total	4350

Professional trainings

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

**RESEARCH ACTIVITY
OF VETERINARY MEDICINE FACULTY**

(Published in 2005)

INSTITUTE OF INFECTIOUS AND INVASIVE DISEASES

12 Akademicka, Lublin

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

SUB-DEPARTMENT OF EPIZOOTIOLOGY AND CLINIC OF INFECTIOUS DISEASES

30 Głęboka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Łukasz Adaszek, Stanisław Winiarczyk, Krzysztof Tomczuk, Wojciech Łopuszyński,
Zbigniew Grądzki, Anna Ziętek, Jacek Madany

BALANTIDIOSIS IN SNAKES

Przypadki balantidiozy węży

The aim of this study was to recognize the etiological agents of an illness affecting snakes where the clinical symptoms were evident in the digestive tract. The disease came out after arrival of new snakes. Bacteriological examinations of feces, vomits and swabs from cloacae revealed bacterial species such as *E. coli* and G+ anaerobes. In microscopical picture of vomits from sick animals, a large number of *Balantidium coli* was detected. A parasitological examination of feces also revealed a large number of cysts of this parasite in feces of other

snakes. Pathological changes in stomach and intestines were characteristic of *enteritis fibrinosa chronica alterativa and enteritis diptheroidea*.

The results of laboratory examinations, clinical symptoms and satisfactory therapeutic effects following the application of metronidasolum indicated that the etiological agents of this disease were *Balantidium coli* and *E. coli* with G+ anaerobes.

Publication: Medycyna Wet. (Lublin) 61, 583–584, 2005. In Polish, summary in English.

Stanisław Winiarczyk, Łukasz Adaszek, Jacek Kutrzuba, Anna Śmiech,
Zbigniew Grądzki

SEVERE STAPHYLOCOCCOSIS IN BERNESE SENNENHUND

Ciężki przebieg stafylokokozji u berneńskiego psa pasterskiego

The aim of the study was to recognise the etiological factor of the dog's sickness with symptoms of *otitis externa, dermatitis purulenta, conjunctivitis* and lameness. The diagnosis was based on the clinical examinations of animal, section, histopathological, and bacteriological tests. *Staphylococcus aureus* was isolated in the swabs from ears and wrist joint by the bacteriological examinations. The observed changes in the internal organs, especially in joints while section and in histopathological preparations were characteristic for infections by this bacteria.

Analysis of the results indicated that the ethiological factor of the disease was the infection by *Staphylococcus aureus*. The disease was probably caused by high virulence of these bacteria and full susceptibility of the dog.

Publication: Życie Wet. (Warszawa), 80, 640–642, 2005 In Polish.

Stanisław Winiarczyk, Przemysław Zięba

COMPARISON OF THE EFFICACY OF RT-PCR AND VIROLOGY EXAMINATIONS IN DIAGNOSING EQUINE VIRAL ARTERITIS

Porównanie przydatności metody RT-PCR i badania wirusologicznego
w diagnostyce wirusowego zapalenia tętnic koni

The aim of the study was to evaluate the efficacy of the RT-PCR method and virology examination (VI) in detecting the EAV-equine arteritis virus in stallion

semen. Total 71 semen samples were examined by RT-PCR. Seven samples gave positive results during the first PCR and eight additional amplicons were obtained in the nested PCR. A total of 15 samples tested positive for the presence of EAV genetic material. 29 semen samples were selected for virology investigations from seropositive stallions, and 15 positive and 14 negative by the PCR method. Cytopathic effects in RK-13 cells were shown to be positive by RT-PCR in 12 out of 15 samples. All the samples taken from stallions which were negative by RT-PCR were also negative by virology examination. Seven mares were mated to three stallions positive by RT-PCR and subjected to serological examination in order to verify their status. Blood samples from the mares were taken before and on 28 days after mating. All serologically negative mares underwent seroconversion; one of them had a fever of 38,5°C, discharge from the right eye and skin eczema on the back. The results of this study support the use of the PCR as an alternative method to VI for detecting EAV in semen.

Publication: Medycyna Wet. (Lublin) 61, 207–211, 2005, tab. 3. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

BUCZEK K., GLIŃSKI Z., LUFT-DEPTUŁA D., PLISZCZYŃSKI M.: The value of phagocytic index in wintering worker bees, *Apis mellifera* L. (Wartość indeksu fagocytarnego zimujących robotnic *Apis mellifera* L.).

Ref. XLII Scientific Beekeeping Conference. Pulawy 8–9 III 2005.

Publication: Materials of the XLII Scientific Beekeeping Conference, 72–73, 2005. In Polish.

BUCZEK K., GLIŃSKI Z.: Antimicrobial immune proteins of bumblebee, *Bombus terrestris* (Apidae).

Ref. XXXIX Apimondia International Apicultural Congress, Dublin, Ireland 21–26 VIII 2005.

Publication: Abstracts XXXIX Apimondia International Apicultural Congress, Dublin, 164, 2005. In English.

GLIŃSKI Z., BUCZEK K., LUFT-DEPTUŁA D., PLISZCZYŃSKI M.: Trials to evaluate the level of antibacterial immunity in wintering honeybee, *Apis mellifera* L., using the protection test.

Ref. XXXIX Apimondia International Apicultural Congress, Dublin, Ireland 21–26 VIII 2005.

Publication: Abstracts XXXIX Apimondia International Apicultural Congress, Dublin, 165, 2005. In English.

GLIŃSKI Z., LUFT-DEPTUŁA D., PLISZCZYŃSKI M.: Modulation of humoral immune responses in the honey bee (*Apis mellifera*) and in the bumble bee (*Bombus terrestris*). (Modulacja humoralnej odpowiedzi immunologicznej u pszczoły miodnej, *Apis mellifera* i trzmiela ziemnego *Bombus terrestris*).

Ref. XLI Scientific Beekeeping Conference, Pulawy, 9–10 III 2004.

Publication: Materials of the XLI Scientific Beekeeping Conference, 59–60, 2004. In Polish.

GLIŃSKI Z., BUCZEK K.: Key mechanisms of the hemocytic immune responses in bumble bees.

Ref. XXXIX Apimondia International Apicultural Congress, Dublin, Ireland 21–26 VIII 2005.
Publication: Abstracts XXXIX Apimondia International Apicultural Congress, Dublin, 164–165, 2005. In English.

GLIŃSKI Z.: Cell-free immune responses of wintering honeybee, *Apis mellifera* L.

Ref. XXXIX Apimondia International Apicultural Congress, Dublin, Ireland 21–26 VIII 2005.
Publication: Abstracts XXXIX Apimondia International Apicultural Congress, Dublin, 164, 2005. In English.

GLIŃSKI Z.: Trials to use insect immune polypeptides and proteins for therapy of infectious diseases of humans, animals and plants. (Możliwość wykorzystania polipeptydów i białek odpornościowych owadów w terapii chorób infekcyjnych ludzi, zwierząt i roślin).

Ref. XX Scientific Beekeeping Conference „Varroasis of bees and beekeeping” Olsztyn-Kortowo 27 IX 2005.

Publication: Materials of the XX Scientific Beekeeping Conference „Varroasis of bees and beekeeping” Olsztyn-Kortowo, 24–26, 2005. In Polish.

GRĄDZKI Z., ZIĘTEK A., HETMAN E., WINIARCZYK S.: The use of microbiological culture and PCR for isolation and identification of *Rhodococcus equi* in soil samples. (Wykorzystanie badania hodowlanego i metody PCR do izolacji i identyfikacji *Rhodococcus equi* w glebie).

Ref. VII Conference on Molecular Biology in Diagnostics of Infectious Diseases and Biotechnology. Warszawa, 3 VII 2005.

Publication: Proceedings of the VII Conference on Molecular Biology Diagnostics of Infectious Diseases and Biotechnology, 53–56, 2005. In Polish.

OTHER PUBLICATIONS

GLIŃSKI Z., KOSTRO K.: Infectious diseases of dogs and cats. Immunity, pathology and therapy. (Choroby zakaźne psów i kotów. Odporność, patologia, terapia).

Publication: Państwowe Wydawnictwo Rolnicze i Leśne, Warszawa, 2005, pp. 314. In Polish.

GLIŃSKI Z., KOSTRO K.: Is viral hepatitis type E a zoonotic disease? (Wirusowe zapalenie wątroby typu E zoonozą?).

Publication: Życie Wet. 80, 335–337, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: New emerging zoonoses a threat for human health. (Nowo pojawiające się zoonozy zagrażające zdrowiu publicznemu).

Publication: Życie Wet. 80, 481–484, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: Zoonoses in cattle breeding Leptospirosis. (Choroby odzwierzęce w hodowli bydła. Leptospiroza).

Publication: Hodowca Bydła 8/05, 48–49, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: *Clostridium difficile* – pathogen of pigs and humans. (*Clostridium difficile* – patogen świń i człowieka).

Publication: Trzoda Chlewna 42 (10) 114–116, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: *Francisella tularensis* a dangerous pathogen of animals and man. (*Francisella tularensis* groźnym patogenem zwierząt i człowieka).

Publication: Magazyn Wet. 14, 55–57, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: Pigs and avian influenza. (Świnie a grypa ptasia).

Publication: Trzoda Chlewna 43 (11) 111–113, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: Epizootic haemorrhagic diseases of deer (EHD) – new infectious disease under control in Poland (Krwotoczna choroba zwierzyny płowej (EHD) – nowa choroba zakaźna podlegająca zwalczaniu na terenie Polski).

Publication: Życie Wet. 80, 21–23, 2005. In Polish.

GLIŃSKI Z., KOSTRO K.: The role of immunological system of pig in control of veral infection (Rola układu immunologicznego świni w likwidacji zakażeń wirusowych).

Publication: Trzoda Chlewna. 53, 12, 122–124, 2005. In Polish.

GLIŃSKI Z., KOSTRO K., LUFT-DEPTUŁA D.: Epizootic haemorrhagic disease of deer (EHD) – new infectious disease under control in Poland. (Krwotoczna choroba zwierzyny płowej (EHD) – nowa choroba zakaźna podlegająca zwalczaniu na terenie Polski).

Publication: Annales UMCS (Lublin), sectio DD, 60, 59–67, 2005, tab. 1. In Polish, summary in English.

KOSTRO K.: Prevalence, diagnostics, control and prophylaxis of dermatophytoses in breeding foxes. (Występowanie, diagnostyka oraz metody zwalczania i zapobiegania grzybic skórnych lisów hodowlanych).

Publication: Workshop PZH and PZF, Warszawa, 20–24. 2005. In Polish.

KOSTRO K., KRAKOWSKI M., KRAKOWSKI L., WÓJCICKA-LORENOWICZ K.: The influence of unspecific immunostimulation on the level of haptoglobin in sera of female polar foxes in a reproductive period. (Wpływ niespecyficznego immunostymulacji na poziom haptoglobiny w surowicach samic lisów polarnych w okresie rozrodu).

Publication: Medycyna Wet. 61, 26, 2005. In Polish.

WINIARCZYK S., ADASZEK Ł., ZIĘBA P., GRĄDZKI Z.: PCR method in diagnosing EAV. (Metoda PCR w diagnostyce wirusowego zapalenia tętnic koni).

Publication: Medycyna Wet. (Lublin) 61, 861–864, 2005. In Polish, summary in English.

SUB-DEPARTMENT OF FISH DISEASES AND BIOLOGY

12 Akademicka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Leszek Guz

INHIBITORY ACTIVITY OF THE MUCUS AND SERUM OF THE CARP (*Cyprinus carpio* L.) IN RELATION TO AEROMONAS HYDROPHILA PROTEASES. I. SEASONALITY

Hamowanie aktywności proteazowej *Aeromonas hydrophila* przez śluz i surowicę karpia
(*Cyprinus carpio* L.).
I. Wpływ sezonowości

The carp (*Cyprinus carpio* L.) is a teleost fish which has recently become an important species for aquaculture. As such, there is a need for basic data on the biology of this species and in particular the immune system. Thus, the aim of this study was to investigate the inhibitive activity of mucus and serum of carps in relation to *A. hydrophila* proteases in three different seasons: spring, summer and winter.

In relation to bacterial caseinases, percent inhibitive activity (PIA) of carps mucus taken during the spring demonstrated the lowest activity (59.8%±4.8), whilst greatest activity in summer (64.7%±6.7) and autumn (71.5%±3.4). In relation to elastases, PIA of mucus were lower during the spring (37.3%±5.1) than in summer (47.2%±6.5) and autumn (49.1%±4.7). PIA serum in relation to caseinases were lower in spring (58.2%±5.8) than in summer (74.5%±4.8) and autumn (76.3%±5.0), whilst PIA of serum in relation to elastases were 40.7%±5.5, 52.9%±3.7 and 55.2%±3.7 respectively.

These results clearly showed that during the spring and autumn there was a strong increase in inhibitive activity of carps' mucus and serum in relation to *A. hydrophila* caseinases and elastases, and are consistent with the hypothesis that immune response of fish is dependent on season of year.

Publication: Annales UMCS (Lublin), sectio DD, 60, 95–102, 2005. In Polish, summary in English.

Leszek Guz

**INHIBITORY ACTIVITY OF THE MUCUS AND SERUM OF THE CARP
(*Cyprinus carpio* L.) IN RELATION TO AEROMONAS HYDROPHILA PROTEASES
II. EFFECT OF TRANSPORT STRESS**

Hamowanie aktywności proteazowej *Aeromonas hydrophila* przez śluz i surowicę karpia
(*Cyprinus carpio* L.).

II. Wpływ stresu transportowego

Immune response of ectothermic animals is known to vary seasonal. To understand how the carp skin mucus and serum antiproteolytic activity change in the different seasons under stress condition, the present study was performed. The objective was to investigate the level of inhibition of bacterial proteases activities by carps' serum and mucus in fish of good health under the stress transport. Influence of mucus of carps subjected to stress transport in spring, summer and autumn seasons on the percent of inhibition of bacterial caseinases significantly lower in stressed fish groups than in control groups. Inhibition of bacterial elastases was significantly lower in stress fish group as against control group only in spring season. Influence of serum of carps on the percent of inhibition of bacterial proteases, caseinases and elastases, was significantly lower in stressed fish in spring, summer and autumn seasons.

Publication: Annales UMCS (Lublin), sectio DD, 60, 103–108, 2005. In Polish, summary in English.

Leszek Guz

**INHIBITORY ACTIVITY OF THE MUCUS AND SERUM OF THE CARP
(*Cyprinus carpio* L.) IN RELATION TO AEROMONAS HYDROPHILA PROTEASES.
III. INFLUENCE OF COPPER SULPHATE, TRICHLORFON AND BURN LIME**

Hamowanie aktywności proteazowej *Aeromonas hydrophila* przez śluz i surowicę karpia
(*Cyprinus carpio* L.).

III. Wpływ siarczynu miedzi, trichlorfonu i wapna palonego

Cupric sulfate, Neguvon and burnt lime treatments and prophylactics of fish are widely used for control of parasitic infections in fish farms, and the effects of these chemicals on parasite infection have been studied. However, effects of cupric sulfate, Neguvon and burnt lime on the serum and skin mucus inhibitive activity in relation to *A. hydrophila* proteases still need elucidation. The present study revealed that exposure of carp to cupric sulfate, Neguvon and burnt lime

affected the mucus and serum antiproteolytic activity. Limited exposure of fish to cupric sulfate (0,3 mg/l; 12 h), Neguvon (1 ppm; 48 h) and burn lime (3 d and 10 d; pH 8,5 – 8,8) reduced inhibitive activity of mucus and serum in relation to *A. hydrophila* caseinases and elastases compared to control group.

Publication: Annales UMCS (Lublin), sectio DD, 60, 110–115, 2005. In Polish, summary in English.

Magdalena Guz, Leszek Guz

AMMONIA EMISSION FROM TURKEY FARM

Emisja amoniaku do powietrza z ferm indyków

The article presents the results of computer calculations concerning ammonia spreading from turkey farm. The results show, that even in case of a relatively small turkey farm (3600 turkeys), permissible emission is surpassed. Pollutant range equals 35 m from the poultry house, both in the eastern and western direction. Building location within this pollutant range should be forbidden.

Publication: Annales UMCS (Lublin), sectio DD, 60, 158–165, 2005. In Polish, summary in English.

Leszek Guz, Maria Bernadetta Studzińska, Andrzej Bernard Sadzikowski,
Jerzy Lech Gundlach

***Anisakis* SIMPLEX LARVAL INFESTATION IN SMOKED HERRINGS**

Larwy *Anisakis simplex* w wędzonych śledziach

Herrings (*Clupea harengus*) are pelagic fish which may become infected with *Anisakis simplex* larvae by consumption of euphausiids, which are intermediate hosts of these nematodes. The ingestion of *A. simplex* larvae parasitized fish can cause human anisakiosis.

The aim of this study was to examine the prevalence of larval anisakids in smoked herrings from the hypermarkets in Lublin (eastern Poland). Larval anisakids were found in 83.3% of the fish examined; in three hypermarkets – 70%,

90% and 90% respectively. The variation in infection levels with host size was surveyed.

Publication: Annales UMCS (Lublin), sectio DD, 60, 88–94, 2005. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

GUZ L.: Inhibitory effects of metal ions on the activity of the *Aeromonas* supernatant protease activity.

Ref. International Conference: Importance of pathogenetic mechanisms in the therapy and prophylaxis of diseases. Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61, (suppl.) 20, 2005. In English.

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Ref. Congress of the EUROTOX (European Societies of Toxicology), Cracow 11–14 IX 2005.

Publication: Toxicology Lett., 158, (suppl.) 1, 138, 2005. In English.

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Ref. International Conference: Importance of pathogenetic mechanisms in the therapy and prophylaxis of diseases, Lublin, 22–23 IX 2005.

Publication: Medycyna Wet (Lublin) 61, (suppl.) 21, 2005. In English.

SZUBSTARSKA D., Sopińska A.: The influence of antigen *Aeromonas hydrophila* on the activity of carps fagocytic cells (Wpływ podania antygenu bakteryjnego na aktywność komórek fagocytarnych karpia.)

Ref. IIth Conference: Protection of health fish Jurata 3–5 X 2005.

Publication: Materials of the Conference 113–115, 2005 In Polish.

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GUZ L.: Tape worms of carp (Tasiemczyce karpia).

Publication: Magazyn Wet. 9, 66–68, 2005. In Polish.

GUZ L., STUDZIŃSKA M.B., SADZIKOWSKI A.B., GUNDŁACH J.L.: Anisakiosis (Anisakioza).

Publication: Annales UMCS (Lublin), sectio DD, 60, 74–87, 2005. In Polish, summary in English.

SUB-DEPARTMENT OF PARASITOLOGY AND INVASIVE DISEASES

12 Akademicka, Lublin

Head: Prof. ordin. Dr. habil. Jerzy Lech Gundlach
Prof. Dr. habil. Andrzej Bernard Sadzikowski

RESEARCH STUDIES (SUMMARIES)

Jerzy Lech Gundlach, Andrzej Bernard Sadzikowski, Halina Stepień-Rukasz,
Maria Bernadetta Studzińska, Krzysztof Tomczuk

COMPARISON OF SOME SEROLOGICAL METHODS AND COPROSCOPIC EXAMINATIONS FOR DIAGNOSIS OF *Giardia spp.* INVASION IN DOGS

Giardiasis was detected in 53.5% of 86 dogs examined by FASTest® Giardia Strip for use in dogs. Using the ProSpecT® Giardia EZ Microplate Assay™, 52.2% of these results was confirmed. Cysts of *Giardia spp.* were found only in 6.5% samples of feces examined by flotation or decantation techniques. The examinations confirmed difficulties in coproscopic diagnosis of giardiasis in dogs. They proved greater usefulness of FASTest® Giardia Strip for immunodiagnoses of giardiasis in carnivores.

Publication: Pol. J. Vet. Sci., 8, 137–140, 2005, tab. 1. In English.

Krzysztof Tomczuk, Łukasz Kurek, Adam Stec, Maria Studzińska, Jacek Mochol

INCIDENCE AND CLINICAL ASPECTS OF COLON CILIATE *Buxtonella sulcata* INFECTION IN CATTLE

The objective of the studies was to determine the intensity of invasion of *Buxtonella sulcata* ciliates in the colon of ruminants and the probability of its effect on the incidence of periodical recurrent diarrhoea of undetermined etiology in diary cattle. The studies were carried out in two stages at 19 farms in the Lublin region. They covered 122 cows NCB and HF breeds as well as their hybrids. The studies revealed significant common incidence of this protozoan.

Also the increasing frequency of diarrhea incidence proportional to the increasing intensity of invasion was noticed as well. With the intensity exceeding 1000 cysts per 1 g of faeces, diarrhea was found in almost 90% of the examined animals, and with intensity over 2000 in all the cows.

Publication: Bull. Vet. Inst. Pulawy 49, 29–33, 2005, tab. 3. In English.

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Publication: Wydawnictwo Akademii Rolniczej, Lublin, 2005, pp. 160. In Polish.

SADZIKOWSKI A.B., GUNDLACH J.L.: Animals the source of parasitic invasions for humans. Hydatidosis. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Bąblowica).

Publication: Aktualności AR (Lublin) 9, 33, 2005, fig. 3. In Polish.

SADZIKOWSKI A.B., GUNDLACH J.L.: Animals – the source of parasitic invasions for humans. Taeniosis of *Taenia saginata*. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Tasiemczyca powodowana przez *Taenia saginata*).

Publication: Aktualności AR (Lublin) 9, 19, 2005, fig. 2. In Polish.

SADZIKOWSKI A.B., GUNDLACH J.L.: Animals – the source of parasitic invasions for humans. Taeniosis of *Taenia solium*. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Tasiemczyca powodowana przez *Taenia solium*).

Publication: Aktualności AR (Lublin) 9, 23, 2005, fig. 2. In Polish.

SADZIKOWSKI A.B., GUNDLACH J.L.: Animals – the source of parasitic invasions for humans. Diphylobotriosis. (Zwierzęta źródłem inwazji pasożytów dla człowieka. Difylobotrioza).

Publication: Aktualności AR (Lublin) 9, 24, 2005, fig. 2. In Polish.

SUB-DEPARTMENT OF POULTRY DISEASES

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

RESEARCH STUDIES (SUMMARIES)

Jerzy Rzedzicki, Monika Skowron, Agnieszka Kolasa, Ewelina Pyzik

INFLUENCE OF SELECTED ANTIBIOTICS ON SEROLOGICAL TEST RESULTS AT HENS INFECTED WITH *Salmonella* ENTERITIDIS RODS

Salmonella rods belong to the most widespread microorganisms in the environment. Their role as toxico-infection factor is significant and it is related to the common occurrence in poultry. That is why an important role in transmission of the microbe is played by poultry. To limit the losses caused by *Salmonella* it is necessary to identify the infection factor as quickly as possible and introduce effective control of products of poultry origin throughout the production cycle.

The purpose of the studies was to determine the effect of the selected antibiotics on the results of serological tests in the case of birds naturally infected by *Salmonella* rods and in experimental conditions. The studies were conducted on the birds from two farms in the vicinity of Lublin.

They were infected both naturally and experimentally. The following antibiotics were used in the experiments: amoxicilin with clavulanic acid (Amoksiklaw, Lek Poland), spiramycin with kolistin (Spiracol, Grodziskie Zakłady Farmaceutyczne), linkomycin with spectinomycin (Linco-spectin, Elanco), enrofloxacin (Enrocin, Grodziskie Zakłady Farmaceutyczne), norfloxacin (Nortril, Bremmer Farma), tiamphenicol (Tirsan, Fatro), florphenicol (Nuflor, Schering-Plough Animal Health). The results of serological tests obtained in the group of experimentally infected chicken point out that the applied antibiotic therapy significantly reduced the level of antibodies, which was reflected in the low percentage of positive results achieved in ELISA test and agglutination method. In the case of naturally infected birds, the obtained values showed that the antibiotic therapy had a significantly smaller influence on the level of antibodies and this impact was limited only to some antibiotics (norfloxacin, enrofloxacin, chloramphenicol).

Publication: Annales UMCS (Lublin), sectio DD, 60, 141–148, 2005. In English, summary in Polish.

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STĘPIEŃ-PYŚNIAK D., KOLASA A.: The occurrence and role of the bacterial flora in the egg and reproductive tract of the poultry. (Występowanie i rola flory bakteryjnej w jajach oraz w układzie rozrodczym ptaków).

Ref. X Symposium of Poultry: Pathology of Avian Reproductive Tract – Aetiology, Diagnostics and Controlling”, Polanica Zdrój, 18 IX 2005.

Publication: Monograph X Symposium of Poultry: Pathology of Avian Reproductive Tract – Aetiology, Diagnostics and Controlling, 131–139, 2005. In Polish.

KOLASA A., RZEDZICKI J., STĘPIEŃ PYŚNIAK D.: The colonisation of the chicken reproductive tract, white and yolk egg of the laying hens infected by *Salmonella*. (Kolonizacja jajnika i jajowodu oraz białka i żółtka jaja u kur zakażonych pałeczkami *Salmonella*).

Ref. X Symposium of Poultry: Pathology of Avian Reproductive Tract – Aetiology, Diagnostics and Controlling”, Polanica Zdrój, 18 IX 2005.

Publication: Monograph X Symposium of Poultry: Pathology of Avian Reproductive Tract – Aetiology, Diagnostics and Controlling, 139–148, 2005. In Polish

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Publication: Wydawnictwo Akademii Rolniczej, Wrocław, 125–160, 541–566, 2005. In Polish.

SUB-DEPARTMENT OF VETERINARY MICROBIOLOGY

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Dr. habil. Barbara Majer-Dziedzic

RESEARCH STUDIES (SUMMARIES)

Jolanta Kutkowska, Bożena Modzelewska-Banachiewicz, Grażyna Ziółkowska,
Wojciech Rzeski, Teresa Urbanik-Sypniewska, Zofia Zwolska, Monika Prus

ANTIMICROBIAL ACTIVITY OF 3,4-DISUBSTITUTED-1,2,4-TRIAZOLE DERIVATIVES

Depending on the character of the substituents, 1,2,4-triazole derivatives may exhibit different pharmacological activities such as anti-inflammatory, -fungal, -bacterial, and -viral. The synthesis of (3,4-diaryl-1,2,4-triazole-5-yl) propenoic acid derivatives was performed. The newly synthesized compounds were screened for their *in vitro* antibacterial activity against the followings strains: *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923, *Nocardia sp.* ATCC 12288, *Mycobacterium smegmatis* ZFR 21. Antifungal activity of the tested compounds was screened *in vitro* against: *Trichophyton mentagrophytes*, *T. verrucosum*, *Microsporum canis*, *Candida albicans*, *Malassezia pachydermatis*.

The newly synthesized 3-(3,4-diaryl-1,2,4-triazol-5-yl) propenoic acid derivatives showed a number of broad spectrum activities. Among the compounds described in this paper, the most promising activity was exhibited by *trans* isomers that were effective against a number of bacterial species.

Publication: Acta Pol. Pharm. – Drug Res. 62, 303-306, 2005, fig. 2. In English, summary in English.

Barbara Majer-Dziedzic, Krzysztof Kostro, Jerzy Ziętek

**IMMUNE RESPONSE OF FOXES AFTER VACCINATION WITH AN ATTENUATED
VACCINE AGAINST PARVOVIROSIS OF DOGS**

Odpowiedź immunologiczna u lisów po podaniu atenuowanej szczepionki
przeciw parwowirowi psów

The objective of the study was to determine the level of antibodies in sera of two groups of breeding foxes immunized with an attenuated vaccine against parvovirus of dogs. Group I consisted of 40 females of polar foxes divided into four subgroups on the basis of the dose and route of vaccination. In group II, one variant of the vaccine was applied to 350 polar and silver foxes of both sexes. Blood was obtained in both groups before vaccination, and then in group I six times and in group II once. The level of antibodies was measured by the haemagglutinin inhibition test (HI) and by seroneutralization test (SN). The HI and SN antibodies appeared in sera on the 7th day after vaccination. Their level significantly increased and peaked on the 21st day after vaccination. A high immunogenic value of the utilized vaccine was discovered. In antisera treated with kaolin the level of HI antibodies decreased at least four times. The level of HI antibodies in sera absorbed with pig erythrocytes was accepted as reliable.

Publication: Medycyna Wet. (Lublin) 61, 1064–1067, 2005, tab. 4. In Polish, summary in English

Grażyna Ziółkowska, Stanisław Tokarzewski

**MYCOLOGICAL FLORA – YEAST-LIKE FUNGI ISOLATED
FROM GEESE REPRODUCTIVE FLOCKS**

Występowanie grzybów drożdżopodobnych w stadach gęsi reprodukcyjnych

Geese production in Poland has been very popular in recent years. The state of health of the birds has, besides its effect on production, epidemiological meaning. An important menace in geese broilers and in reproductive flocks are fungal infections. The aim of the study was to estimate the mycological flora – yeast-like fungi isolated from geese reproductive flocks – in relation to the size of the flocks, their housing conditions and the season. The investigations were carried out on 17 reproductive geese of the Italian White breed aged 1 to 4 years, clinically healthy. The material consisted of pharyngeal swabs and cloacal swabs collected from 10 geese from each flock. The examinations were con-

ducted according to the generally accepted methodologies and recommendations for mycological diagnostics. Additionally fungi were identified through analysis by the API-Candida test (bioMerieux). In the examined geese population 10 species of yeast-like fungi from 6 genus were isolated: *Candida*, *Saccharomyces*, *Rhodotorula*, *Geotrichum*, *Trichosporon* and *Lecytophora*. Predominantly obtained *C. albicans* (24.3%), *C. parapsilosis* (17.6%) and *Rhodotorula* spp. (9.1%), rarely *Geotrichum* spp. (6.9%), *C. glabrata* (6.5%), *C. famata* (5.9%), *Trichosporon* spp. (5.2%), *C. krusei* (4.3%), occasionally *Saccharomyces* spp. (1.7%) and *Lecytophora* spp. (isolated in 2 cases). The results indicated that regardless flock size, the buildings they were kept in or the season, two species of yeast-like fungi dominated: *C. albicans* and *C. parapsilosis*. Yeast-like fungi were isolated from large flocks of over 500 geese (*C. albicans* 33.8%, *C. parapsilosis* 20.0%) housed in brick buildings (*C. albicans* 30.0%, *C. parapsilosis* 17.7%). Material from the geese was collected in the spring (*C. albicans* 28.1%, *C. parapsilosis* 20.0%). Generally *C. parapsilosis* occurred more rarely than *C. albicans*.

Publication: Medycyna Wet. (Lublin) 61, 1181–1185, 2005, fig. 5, tab. 1. In Polish, summary in English

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Ref. International Conference „Importance of pathogenetic mechanisms in the therapy and prophylaxis of diseases”, Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61, (suppl.), 29, 2005, In English.

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Publication: Medycyna Wet. (Lublin) 61, (suppl.), 18, 2005, In English.

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Publication: Medycyna Wet. (Lublin) 61, (suppl.), 22, 2005, In English.

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Publication: Weterynaria w Praktyce, 1, 44, 2005. In Polish.

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Publication: Weterynaria w Praktyce, 3, 50, 2005. In Polish.

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Publication: Weterynaria w Praktyce, 4, 46–47, 2005. In Polish.

SUB-DEPARTMENT OF VETERINARY PROPHYLAXIS

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

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MIKUCKI P., WERNICKI A., PUCHALSKI A., URBAN-CHMIEL R.: Use of native and inactivated leukotoxin (Lkt) *Mannheimia haemolytica* in specific immunoprophylaxis of respiratory syndrome in sheep.

Ref. International Conference „Importance of pathogenetic mechanisms In the therapy and prophylaxis of diseases” Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61, (suppl.), 26, 2005. *In English.*

URBAN-CHMIEL R., PUCHALSKI A., WERNICKI A.: The influence of the transport stress on susceptibility of bovine leukocytes on cytotoxic effect of *M. haemolytica* leukotoxin.

Ref. International Conference „Importance of pathogenetic mechanisms In the therapy and prophylaxis of diseases” Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61, (suppl.), 28, 2005. *In English.*

URBAN-CHMIEL R.: The influence of increase of the temperature on heat shock proteins expression among wildtype *M. haemolytica* strains.

Ref. International Conference „Importance of pathogenetic mechanisms In the therapy and prophylaxis of diseases” Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61, (suppl.), 28, 2005. *In English.*

KOWALCZYK-PECKA D., PUCHALSKI A.: Correlated synthesis of molecular and phenotypic homogeneity among the large population of *Salmonella* Enteritidis strains from people and animals.

Ref. International Symposium „Molecular and physiological aspects of regulatory processes of the organism” Cracow, 2–3 VI 2005.

Publication: Materials of XIV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS. Cracow, 222–223, 2005. In English.

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WERNICKI A., CYBULSKI W.: 60 year anniversary of the Faculty of Veterinary Medicine. in Lublin.

History – tradition – now-a-day – perspectives. (60 lat Wydziału Medycyny Weterynaryjnej w Lublinie. Historia – tradycje – terażniejszość – perspektywy).

Publication: Aktualności AR (Lublin) 8, 2–10, fig. 2, 2004. *In Polish.*

DEPARTMENT OF ANATOMY AND ANIMAL HISTOLOGY

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SUB-DEPARTMENT OF ANIMAL ANATOMY

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

RESEARCH STUDIES (SUMMARIES)

Zbigniew Boratyński, Stanisław Flieger, Agnieszka Pedrycz, Marcin Wieczorski

APOPTOSIS IN RAT HEPATOCYTES – HISTOLOGICAL, ULTRASTRUCTURAL AND IMMUNOHISTOCHEMICAL ASSESSMENT

Apoptoza hepatocytów szczura – ocena histologiczna, ultrastrukturalna
i immunohistochemiczna

Programmed cell death used in multicellular organisms in order to naturally select cells in their body is today a widely investigated phenomenon. Precise knowledge about this phenomenon could be used in medicine to cause the death of unnecessary, ill cells (for example neoplastic cells) or to inhibit excessive cell death. Thus, all studies in this area which could shed more light on apoptosis are important.

The present study investigated the phenomenon of cellular death induced by Adriamycin – an antineoplastic antibiotic, using histological, ultrastructural and immunohistochemical methods. The investigation was performed on the livers of 7 weeks-rats following intraperitoneal administration of the drug at a dose of 5 mg/kg of body weight.

Apoptosis and its localisation in liver lobule were evident in immunohistochemistry by the expression of proapoptotic protein BAX. Histological and ultrastructural investigations showed: lysis of cells, blurring of cellular organelles, orthodoxic state of mitochondria or their destruction, and fragmentation of rough endoplasmic reticulum, picnotic nuclei proved apoptosis after Adriamycin.

Publication: Medycyna Wet. (Lublin) 61, 1420–1424, 2005, fig. 8. In Polish, summary in English.

Zbigniew Boratyński, Izabela Krakowska

**SOURCES OF THE AUTONOMIC AND AFFERENT FIBRES
OF THE KIDNEYS IN SHEEP**

The experiment was performed on 5 sheep. Operational procedures were realized according to classical surgical methods in general anaesthesia. The animals were kept alive for 21 days and subsequently put down and sectioned for the following material: the brain stem, the spinal cord with all spinal ganglia, all the ganglia of sympathetic trunk and the ganglia and plexuses of abdominal and pelvic cavities. The material was fixed in histological slides. The localisation of retrograde changes in nerve cells, presented here, allows to state that the autonomic and afferent nerve fibres attending to the kidneys in sheep originate from the central, as well as from the peripheral autonomic nervous system.

Publication: Bull. Vet. Inst. Pulawy, 49, 141–145, 2005, fig. 3, tab. 1. In English, summary in English.

Izabela Krakowska, Małgorzata Matysek, Zbigniew Boratyński

DEVELOPMENT OF *Hippocampus slit* IN THE FETAL LIFE OF CATTLE

Rozwój szczeliny hipokampa w okresie prenatalnym u bydła domowego

The aim of the research was to describe the development of *hippocampus slit* in the fetal life of cattle. The study was conducted on cerebra of cattle embryos, aged 8, 12, 14, 16, 18, 20 and 23rd week of fetal life as well as on an infant. The histological preparations were taken and stained according to Nissel and Kluver-Barrera's method. The papers describe the process of *hippocampus slit*'s forming, define its shape in the different development periods, check on the process of obtaining the form characteristic for mature specimens, as well as determine the accurate embryos' age, in which the described form appears. The research revealed that the most intense development of *hippocampus slit* can be observed in the first half of pregnancy. The stage of the full morphological picture appears in the last pregnancy trimester and in an infant. The papers also contain the comparative study of various stages of *hippocampus slit*'s development for cattle and other animal species as well as human.

Publication: Medycyna Wet. (Lublin) 61, 808–810, 2005. In Polish, summary in English.

Małgorzata Matysek, Izabela Krakowska, Zbigniew Boratyński, Barbara Badzian

**MORPHOMETRIC ANALYSIS OF *Nucleus lateralis cerebelli*
AND *Nucleus interpositus medialis cerebelli* IN FETAL LIFE OF CATTLE**

Analiza morfometryczna rozwoju jądra wsuniętego bocznego
i jądra wsuniętego przyśrodkowego w życiu płodowym bydła

The study was conducted on fetal cerebella of cattle at the age of 8, 14, 16, 18, 20 and 23rd week of life. After fixing, the material was stained according to Nissl's, Kluver-Barrera's methods and additionally with cresyl violet. Morphometric analysis of nerve cells and their nuclei was conducted.

On the basis of the experiments conducted it was possible to state presence of two nuclei: *nucleus interpositus medialis* and *nucleus interpositus lateralis* in the grey matter of the cerebellum.

It was also observed that the cells of *nucleus interpositus lateralis* appear earlier and are characterized by quicker growth while the cells of *nucleus inter-*

positus medialis, despite the fact that they mature later, are bigger by about 70% in their differentiation stage.

Publication: Medycyna Wet. (Lublin) 61, 438–440, 2005. In Polish, summary in English.

Izabela Krakowska, Małgorzata Matysek, Zbigniew Boratyński

**THE COMPARISON OF MORPHOMETRIC ANALYSIS OF CEREBELLUM NUCLEI
(*nucleus dentatus and nuclei fastigii and nucleus interpositus lateralis
and nucleus interpositus medialis*) IN THE FETAL LIFE OF CATTLE**

The cerebellum of the cow fetuses at age 8, 12, 14, 16, 18, 20 i 23-weeks were used in this experimental research. Morphometric analysis of four cerebellum nuclei in fetal life of cattle were examined. The measurements of neurocyte and neuroblastes were done by morphometrical analysis using Multi Scan software. The material was stained according to the Klüver-Barreras method and with cresyl violet. In the 16th week of fetal life neurocytes were visible only in the nucleus fastigii. In other cerebellum nuclei we could observe neuroblasts. The neuroblast nuclei were visible after staining with violet cresyl while the cytoplasm was hardly visible. The nuclei were large, circular and surrounded with a small amount of the cytoplasm. In the 18th week of fetal life the average cell surface area was the largest in the nucleus interpositus medialis cerebelli. In the 20th and 23th weeks of fetal life the neurocyte surface area was the largest in the nucleus dentatus and the nucleus fastigii. At the end of pregnancy nucleus interpositus lateralis showed the smallest average cell surface area. In the case of all four cerebellum nuclei the results indicate onslow cell development in cattle fetuses in the first part of pregnancy. In the second part of pregnancy, cell development is much faster.

Publication: Acta Neurobiol. Exp. Warsaw, 65, 338, 2005. In English, summary in English.

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Publication: Papers presented during XXI Congress of The Polish Anatomical Society, Kielce, 33, 2005.
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Ref.: XXI Congress of Polish Anatomical Society, Kielce, 23–25 VI 2005.
Publication: Papers presented during XXI Congress of The Polish Anatomical Society Kielce, 32, 2005.
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Ref.: XII Congress of Polish Society of Clinical and Experimental Immunology, Lublin. 19–22 V 2005.
Publication: Pol. J. Environ. Stud. 14, suppl. II part II, 633–635, 2005. In English.
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Ref.: International Conference: „Importance of pathogenic mechanisms in the therapy and prophylaxis of diseases”, Lublin, 22–23 IX 2005.
Publication: Medycyna Wet. (Lublin), 61, (suppl.) 38, 2005. In English.
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Ref.: XXI Congress of Polish Anatomical Society, Kielce, 23–25 VI 2005.
Publication: Papers presented during XXI Congress of The Polish Anatomical Society, Kielce 118, 2005.
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Ref.: International Conference: „Importance of pathogenic mechanisms in the therapy and prophylaxis of diseases”, Lublin, 22–23 IX 2005.
Publication: Medycyna Wet. (Lublin), 61, (suppl.) 34, 2005. In English.
- RADZIKOWSKA E., ŁUSZCZEWSKA-SIERAKOWSKA I., MADEJ B., MACIEJEWSKI R.: Cholestasis induced by long-term estrogen therapy-animal experimental model.
Ref.: VII Scientific Conference of the Polish Association for the Study of the Liver (PASL) on: „Progress in Hepatology”, Mikołajki, 5–7 VI 2005.
Publication: Experimental and Clinical Hepatology, 1(2) 38, 2005. In English.

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Publication: Pol.J. Environ. Stud. 14, suppl. II part II, 633–635, 2005. In English.

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Publication: Medycyna Wet. (Lublin), 61, 82–85, 2005. In Polish.

SUB-DEPARTMENT OF HISTOLOGY AND EMBRYOLOGY

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

RESEARCH STUDIES (SUMMARIES)

Regina Cybulska, Jadwiga Jaworska-Adamu, Małgorzata Kalinowska

EVALUATION OF PERITONEAL APPLICATION OF SODIUM GLUTAMATE ON DORSAL ROOT GANGLIA AND FRONTAL CORTEX OF ADULT RATS

Ocena wpływu pozajelitowego podania glutaminianu sodu
na struktury zwojów rdzeniowych i kory czołowej dorosłych szczurów

The aim of the study was to investigate the influence of five times peritoneal application of sodium glutamate in 1g/kg body weight doses on the morphological structures of lumbar region (L₁–L₄) dorsal root ganglia and frontal cortex of adult (3-months old) Wistar rats. Semithin slides made from dorsal root ganglia and frontal cortex samples were assessed under the light microscope and ultra-thin slides were examined under the electron microscope. No changes observed in the frontal cortex, yet they were detected in the dorsal root ganglia. These changes appeared in the form of mitochondrial swelling and loss of mitochondrial cristae in ganglia neurons and surrounding satellite cells. The results suggest a cytotoxic influence of sodium glutamate peritoneally applied.

Publication: Medycyna Wet. (Lublin) 61, 573–576, 2005, fig. 8. In Polish, summary in English.

REPORTS TO RESEARCH MEETINGS

CYBULSKA R., DMOWSKA M., SCHOENBORN R., JAWORSKA- ADAMU J., WLAŻ P.: Neuronal death in the rat hippocampus in experimental epilepsy.
Ref. XIV International Symposium „Molecular and Physiological Aspects of Regulatory Processes of the Organism”, Cracow 2–3 VI 2005.

Publication: Materials of XIV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS, 73–75, 2005. In English.

CYBULSKA R., DMOWSKA M., PIERSIAK T., SCHOENBORN R., JAWORSKA-ADAMU J., WLAŻ P.: Lipopolysaccharide preconditioning attenuates hippocampal damage associated with pilocarpine-induced status epilepticus in rats.

Ref. XIV International Symposium „Molecular and Physiological Aspects of Regulatory Processes of the Organism”, Cracow, 2–3 VI 2005.

Publication: Materials of XIV International Symposium of Polish Network of Molecular and Cellular Biology UNESCO/PAS, 76–77, 2005. In English.

WAWRZYŃIAK-GACEK A., PAWELEC J., CYBULSKA R.: The study on the contents of iron in various types of oligodendroglia in the *corpus callosum* and *capsula interna* of the brain of thirty days old rats. (Badanie zawartości żelaza w różnych typach oligodendrogleju w obszarze spoidła wielkiego (*corpus callosum*) i torebki wewnętrznej (*capsula interna*) mózgowia 30-dniowych szczurów).

Ref. International Conference „Importance of pathogenetic mechanisms in the therapy and prophylaxis of diseases”, Lublin, 22–23 IX 2005.

Publication: Medycyna Wet. (Lublin) 61(suppl.), 31, 2005. In Polish.

DEPARTMENT OF BIOCHEMISTRY AND ANIMAL PHYSIOLOGY

12 Akademicka, Lublin

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SUB-DEPARTMENT OF ANIMAL PHYSIOLOGY

12 Akademicka, Lublin

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RESEARCH STUDIES (SUMMARIES)

Marek Bienko, Radosław P. Radzki, Iwona Puzio, Małgorzata Kapica,
Tadeusz Studziński

THE INFLUENCE OF ALUMINUM SULPHATE ON BONE RESISTANCE IN BROILER CHICKENS

Wpływ siarczynu glinu na wytrzymałość tkanki kostnej kurcząt brojlerów

The aim of the study was to determine the effect of aluminum sulphate added to the drinking water on bone resistance in broiler chicken during first 4 weeks of life. The experiment was carried out on 80 broiler chickens Hybro race from second day of life to the age of 4 weeks. During the experiment animals had free access to the feed and water with aluminum sulphate solution at 3 different doses: 1 (group A), 2 (group B) and 3 gram per liter (group C). The water level

was controlled daily. At the end of experiment the chickens were slaughtered and femoral bones were collected for further analysis.

Using INSTRON 4302 apparatus, the relationship between the force acting perpendicularly to the long axis of the bone and deformation was characterized by the following parameters: the breaking force and the force of resilience limit (three-point bending test). The internal and external of longitudinal and transverse cross-section was measured on X-ray film using computer software Scion Image (Mac). Aluminum sulphate added to the drinking water significantly decreased the force of resilience limit in female femoral bones in experimental groups in comparison to the control one (154.8 N – control, 133.7 N – group A, 85.1 N – group B and 58.6 N – group C). The breaking force of female femora in experimental groups was significantly lower in comparison to the control group: 272.8 N (control), 231.9 N (group A), 225.6 N (group B) and 170.2 N (group C) respectively. In male femora the breaking force and the force of resilience limit in experimental groups were also lower. The results of this experiment prove the disadvantageous influence of aluminum sulphate solutions added to the drinking water on bone resistance and the internal and external of longitudinal and transverse cross-section in femoral bones in both sexes in all experimental groups.

Publication: Medycyna Wet. (Lublin), 61, 950–954, 2005. In Polish, summary in English.

Marek Bienko, Radosław P. Radzki, Iwona Puzio, Małgorzata Kapica,
Tadeusz Studziński

**BONE MINERAL DENSITY AND OSTEOCALCIN LEVEL IN BROILER CHICKENS
BLOOD PLASMA IN CONDITION OF ALUMINUM SULPHATE INTOXICATION**

Gęstość mineralna tkanki kostnej oraz poziom osteokalcyny u kurcząt brojlerów
w następstwie intoksykacji siarczanem glinu

The aim of the study was to determine the effect of aluminum sulphate added to the drinking water on bone mineral density (BMD) and an osteocalcin level in broiler chicken during first 4 weeks of life. The experiment was carried out on 80 broiler chickens Hybro race, both sexes from second day of life to the age of 4 weeks. During the experiment animals had free access to the feed and water with aluminum sulphate solution at 3 different doses: 1 (group A), 2 (group B) and 3 gram per liter (group C). At the end of experiment the chickens were slaughtered, femora and blood were collected for further analysis. The bone

mineral density was measured on X-ray film using computer software Radiograph (Windows). The osteocalcin level in blood plasma was measured using commercial RIA kit (Incstar, USA) on gamma radioimmunoassay counter (Packard Canberra). Aluminum sulphate added to the drinking water significantly decreased body weight, bone mass in all experimental groups in comparison to the control one. Bone mineral density of female's femora in experimental groups was significantly lower in comparison to the control group: 0.59 – control; 0.5 – group A; 0.49 – group B and 0.46 g/cm² group C respectively. In male femora the BMD values in experimental groups were also lower, but not significant. Aluminum sulphate significantly decreases the osteocalcin level in female blood plasma in all groups in comparison to the control one: 10.55 – control; 7.43 – group A; 7.82 – group B; 7.31 ng/ml – group C respectively. The same tendency was observed in male blood plasma: 8.73 – control; 7.25 – group A; 7.98 – group B; 7.57 ng/ml – group C respectively.

The results of this experiment prove a disadvantageous influence of aluminum sulphate solutions added to the drinking water. The negative effect manifests itself in significantly decreasing body mass and bone weight in the examined broiler chickens. Bone mineral processes are disturbed as the bone mineral density decreases and lowers osteocalcin level – i. e. osteoblast activity marker.

Publication: Medycyna Wet. (Lublin), 61, 562–566, 2005. In Polish, summary in English.

Marta Dąbek, Danuta Kruszewska, Rafał S. Filip, Anna Hotowy,
Łukasz Pierzynowski, Anna Wojtasz-Pająk, Sylwia Szymańczyk,
Jose Luis Valverde Piedra, Ewa Werpachowska, Stefan S. Pierzynowski

A-KETOGLUTARATE (AKG) ABSORPTION FROM PIG INTESTINE AND PLASMA PHARMACOKINETICS

To study the absorption, metabolism and kinetics, the AKG (in different concentrations) was administered intravenously, intra-portally, orally and directly into the ileum or duodenum of pigs, chronically fitted with portal and jugular catheters and T-shaped cannula at the duodenum and ileum. Additionally, this study was conducted to determine the influence of low pH, Fe²⁺ or/and SO₂⁻⁴ on AKG gut absorption and conversely FeSO₄ and FeSO₄/AKG on Fe²⁺ gut absorption. It is concluded that AKG was significantly better absorbed from the upper small intestine than from the distal sections. Furthermore, low pH, Fe²⁺ and/or SO₂⁻⁴ ions enhanced AKG absorption. The AKG administered to the portal vein was rapidly eliminated from the blood (half-life less than 5 min). The

short lifetime for AKG is probably dependent on quick metabolism in the enterocytes and liver. However, the prolonged half life can be related to its low AKG blood concentration. The Fe^{2+} concentrations in blood increased after FeSO_4 and FeSO_4/AKG duodenal infusion. The implication of above observations is important for practical application of the AKG in animal and human nutrition as well in medicine.

Publication: J. Anim. Physiol. Anim. Nutr. 89, 1–8, 2005. In English, summary in English

Katarzyna Dudek, Marcin R. Tatara, Ewa Śliwa, Andrzej K. Siwicki,
Iwona Łuszczewska-Sierakowska, Janusz Zipser, Witold Krupski,
Tadeusz Studziński

EFFECTS OF PERINATAL ADMINISTRATION OF AGED GARLIC EXTRACT (AGE) AND ALLICIN ON NON-SPECIFIC AND SPECIFIC DEFENCE MECHANISMS IN SOWS

The aim of the study was to investigate the effect of aged garlic extract (AGE) and allicin administration on non-specific and specific defence mechanisms in sows during perinatal period. The control group consisted of 6 sows and received vehiculum. AGE (10 ml/100 kg b. w./day) was administered to the second group (n = 6), whereas allicin (1.6 mg/100 kg b. w./day) was administered to the third group (n = 6) of animals. Both the vehiculum and investigated substances were administrated orally from the 91st day of pregnancy up to the piglets weaning on 28th day of their life. The blood samples were collected from sows 7 days before the partum, during the partum and 7 days after the partum. AGE and allicin administration increased lysozyme activity 7 days before the delivery as well as gamma-globulins level investigated 7 days after the partum ($P < 0.05$). The AGE induced higher total protein concentration and gamma-globulins level 1 week before the partum and ceruloplasmin activity 7 days after the following ($P < 0.01$). Moreover, all the investigated parameters in sows increased at the time of delivery after the AGE and allicin treatment ($P < 0.05$). In conclusion, both AGE and allicin improved non-specific defence mechanisms in sows when administered perinatally.

Publication: Pol. J. Environ. Stud. 14, suppl. II, 69–72, 2005, tab. 1. In English, summary in English.

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

**SERUM LIPID PATTERN, HORMONAL STATUS AND BODY FAT DISTRIBUTION
IN RELATION TO SERUM LEPTIN IN OBESE POSTMENOPAUSAL WOMEN**

Profil lipidów, status hormonalny oraz dystrybucja tkanki tłuszczowej
w relacji do stężenia leptyny w surowicy u otyłych kobiet po menopauzie

The aim of the study was the evaluation of the level of leptin in obese post-menopausal women in relation to lipid profile according to the degree of obesity and determination whether obese post-menopausal women with gynoid and android type of obesity differ with respect to lipid profile, leptin concentration and sex hormones. The selection criterion for the study and control groups was a minimum period of 2 years after menopause (natural or surgical) and lack of concomitant diseases, which would affect lipid and hormone body metabolism. The study group covered 80 females with overweight and obesity (BMI>25), while the control group 15 women with normal body weight (BMI<25). There was determined level of leptin, estradiol, DHEA-S, testosterone, and SHBG levels, total cholesterol, HDAL and TG in plasma. Females of the study and control groups differed with respect to leptin and SHBG levels, as well as plasma lipid profile. In the control group leptin level correlated with BMI and cholesterol level. In the sub-groups with BMI of 30. 39.9 and BMI>40 a correlation was observed between the level of leptin and the level of testosterone. In the sub-group with BMI>40 leptin level in plasma correlated with the years of menopause. The sub-groups of women with gynoid and android type of obesity differed with respect to the level of triglycerides. Among females with gynoid type of obesity (WHR<0.85) a significant correlation was observed between leptin level and the levels of SHGB and testosterone. In obese post-menopausal women, a relationship is observed between leptin level and levels of testosterone, SHBG and total cholesterol in plasma.

Publication: Diabetologia Doświadczalna i Kliniczna, 5, 132–137, 2005. In Polish, summary in English.

Małgorzata Kapica, Jose Louis Valverde Piedra, Iwona Puzio, Marek Bieńko,
Sylwia Szymańczyk, Radosław P. Radzki

**THE EFFECT OF FEEDING RAW AND EXTRUDED SOYBEAN PRODUCTS
ON THE PANCREATIC DIGESTIVE ENZYME ACTIVITIES IN YOUNG CALVES**

Preruminant calves under 3 weeks of age digest proteins of plant origin poorly, relatively to milk proteins, a result which may be due to the levels of pancreatic juice secretion and its proteolytic activity. Soybean proteins are often used in feeding young calves. However, soybean products improperly processed may cause severe gastrointestinal disorders in calves and other animals. Gastrointestinal adverse reactions are characterised by alterations in gut morphology and physiology, diarrhoea and poor growth. The aim of this study was to determine the influence of raw and extruded food containing soyabean meal on pancreatic juice enzyme activities in young calves. Experiments were carried out on twelve calves cannulated 3 weeks after birth. Pancreatic juice was collected in 15-min intervals during the preprandial period (30 min), prandial period (15 min) and postprandial period (3 hours). The calves from the control group were fed a semiliquid diet (milk and cereals mixture). The calves from the experimental groups received semi-liquid diet containing additionally soyabean meal in either raw or extruded food. Feeding increased the pancreatic juice secretion in all three groups of calves. After feeding (postprandial period) pancreatic juice secretion decreased in both control and experimental calves, however significantly higher values were found in the experimental groups. Feeding increased protein output of all groups. However, in both Raw Soya and Extruded Soya groups the values were significantly higher compared to that of the control. Protein output decreased after feeding in all groups but in the Extruded Soya group and in Raw Soya group significantly higher protein output was found. Similar patterns to protein output were found for proteolytic activity after feeding. Trypsin activity increased in response to feed intake and remained at significantly higher levels during the postprandial period in the Extruded and Raw Soya groups. A significant increase of protein and trypsin output as well as proteolytic activity in the pancreatic juice was observed in calves fed a diet with raw soyabean meal.

Publication: J. Animal Feed Sci. 14, suppl. 1, 263–266, 2005. In English, summary in English.

Sylwester Kowalik, Rafał S. Filip, Ewa Śliwa, Marcin R. Tatara, Stefan G. Pierzynowski,
Tadeusz Studziński

**INFLUENCE OF ALPHA-KETOGLUTARATE (AKG) ON THE BONE MINERAL
DENSITY OF FEMUR IN PIGLETS**

The aim of this study was to determine the influence of daily oral administration of alpha-ketoglutarate (AKG) on bone mineral density (BMD) of femur and concentration of 17- β -oestradiol in blood plasma during 70 d of postnatal life in piglets. All animals were kept under standard rearing conditions. AKG was administered orally from the first d of life, while the piglets from the control group were treated in the same way and time with physiological saline (PhS). The experimental and control groups of piglets were assigned to 6 age subgroups, namely 3, 14, 21, 35, 56 and 70 d. The animals from both, experimental and control groups were euthanised, then the bone samples were collected and frozen at -25°C until further analyses. Using dual-energy x-ray absorptiometry (DEXA method) bone mineral density of the femora was estimated. Additionally, 17- β -oestradiol concentration in blood plasma in piglets was assayed using RIA-test. The obtained results indicate positive influence of enteral AKG administration on bone mineral density of the femur in piglets. Moreover, AKG increased the level of 17- β -oestradiol in blood plasma in post-weaned piglets.

Publication: Bull. Vet. Inst. Pulawy, 49, 343–348, 2005, tab. 2. In English, summary in English.

Sylwester Kowalik, Ewa Śliwa, Marcin R. Tatara, Witold Krupski, Piotr Majcher, Tadeusz Studziński

**INFLUENCE OF ALPHA-KETOGLUTARATE ON MINERAL DENSITY
AND GEOMETRICAL AND MECHANICAL PARAMETERS OF FEMORA DURING
POSTNATAL LIFE IN PIGLETS**

The purpose of this study was to determine the influence of daily administration of alpha-ketoglutarate (AKG) on mineral density and geometrical and morphometrical parameters of the femur during postnatal life in piglets. The experiment was conducted from the 1st d of neonatal life to the 70th d of postnatal life. Experimental piglets were given AKG in the dosage of 0.4 g/kg b.w./d *per os*, while control piglets were treated *per os* with physiological saline in the dosage of 2 ml/kg b.w./d. The piglets from both groups were divided into 6 subgroups, namely 3, 14, 21, 35, 56 and 70 d. At the end of the experiment the animals were euthanised and right femora were isolated and frozen at -25°C until

further analyses. Using quantitative computed tomography (QCT) method, volumetric bone density of the cortical bone compartment was estimated. Moreover, geometrical, mechanical and morphometrical parameters of the bones were determined. The obtained results indicate that daily administration of AKG increased the cortical bone density, geometrical and mechanical properties of the femur and whole bone morphometry.

Publication: Bull. Vet. Inst. Pulawy, 49, 107–111, 2005, tab. 2. In English, summary in English.

Radosław P. Radzki, Marek Bienko, Iwona Puzio, Rafał S. Filip

EFFECT OF CLENBUTEROL ON MECHANICAL AND GEOMETRIC PARAMETERS OF BROILER CHICKENS' LIMB BONES

The experiments aimed at determination the effect of β_2 -adrenergic agonist clenbuterol on mechanical and geometric parameters, volumetric BMD of broiler chickens' femora and humera.

Clenbuterol significantly increased the body weight both in females and males. The increase of maximal force, resilience and stiffness in femora and humera in males fed the diet with β_2 -adrenergic agonist was observed. Clenbuterol increased the Second Moment of Inertia in Relation to the Horizontal Axis (Ix) and The Cross-Sectional Area (A) in femora of males, whereas values of Ix and A in femora of females of control and experimental groups were on the similar level. No significant differences of Second Moment of Inertia in Relation to the Horizontal Axis and Cross-Sectional Area of humera in females and males, in relation to the controls, were observed. Femora and humera of males have insignificantly higher Mean Relative Wall Thickness, and in females the decrease of this parameter was observed. Volumetric BMD of the shaft of the column of the femora and humera increased in males and decreased in females. Clenbuterol increased the concentration of testosterone and estradiol in blood serum both in females and males. In conclusion, clenbuterol improved quality of bone tissue but exclusively in males, what is probably an effect of a dose used.

Publication: Wien. Tierärztl. Mschr. 92, 86–92, 2005. In English, summaries in English and German.

Tomasz Skrzypek, Jose Luis Valverde Piedra, Henryk Skrzypek, Jarosław Woliński, Waldemar Kazimierczak, Sylwia Szymańczyk, Marta Pawłowska, Romuald Zabielski

**LIGHT AND SCANNING ELECTRON MICROSCOPY EVALUATION
OF THE POSTNATAL SMALL INTESTINAL MUCOSA DEVELOPMENT IN PIGS**

Modifications in the structure of gastrointestinal mucosa is often used to evaluate gut function for instance during the development or in response to particular food components. Scanning electron microscopy (SEM) gives a chance to observe the surface of the gut epithelium in three dimensions. However, this technique is seldom used due to technical difficulties. The present study attempted to investigate the intestinal mucosa structure changes in the postnatal pig using light and scanning electron microscopy technique. Experiments were carried out on sow reared piglets from birth until 38 days of age. Piglets were sacrificed at birth and at the 3rd, 7th, 21st and 38th day of life. The entire gastrointestinal tract was immediately harvested and the whole thickness tissue samples were taken from the duodenum, jejunum and ileum for optical and scanning electron microscopy. SEM analyses corroborated with histometry made by optical microscopy. Moreover, a number of shape modifications of the villi and its surface have been observed. The development changes in small intestine mucosa during the first 3 weeks were manifested in shape, size and density of villi. In conclusion, the structure of small intestinal mucosa undergoes profound structural changes. SEM gives a new dimension in the investigation of gut mucosa.

Publication: J. Physiol. Pharmacol. 56, suppl. 3, 71–87, 2005. In English, summary in English.

Ewa Śliwa, Marcin R. Tatara, Katarzyna Dudek, Andrzej K. Siwicki, Sylwester Kowalik, Stefan G. Pierzynowski, Tadeusz Studziński

**INFLUENCE OF ALPHA-KETOGLUTARATE ADMINISTERED TO PREGNANT SOWS
ON NONSPECIFIC AND SPECIFIC HUMORAL DEFENCE MECHANISM IN NEWBORN
PIGLETS AND DURING TWO WEEKS OF NEONATAL LIFE**

The aim of this study was to establish the influence of alpha-ketoglutarate administered to pregnant sows from the 91st day of pregnancy on lysozyme and ceruloplasmin activity, total protein and total gammaglobulin level in blood serum of newborn piglets from these sows. The sows were treated *per os* with AKG (0.4 g/kg b.w./day), whereas those from the controls were given saline (PhS). The piglets were administered orally AKG (0.4 g/kg b.w./day) starting from the 2nd day after the birth and continued to the 14th day of life. Administration of AKG to sows during pregnancy decreased lysozyme activity in newborn piglets which reached the value of 0.75 mg/l while in the control amounted 0.95 mb/l. Lysozyme activity was higher 72 h after the birth in AKG treated

piglets (0.75 mg/l) in comparison with the controls (0.45 mg/l) and ceruloplasmin activity and gammaglobulin level decreased after AKG administration to piglets. At the age of 14th day ceruloplasmin activity decreased to 90.4 IU/l in comparison with the controls 136.8 IU/l, while the level of IgG was lower (9.5 g/l) than in the controls (16.5 g/l).

Publication: Pol. J. Environ Stud., 14, suppl. II, 356–359, 2005, tab. 1. In English, summary in English.

Ewa Śliwa, Sylwester Kowalik, Marcin R. Tatara, Witold Krupski, Piotr Majcher, Iwona Łuszczewska-Sierakowska, Stefan G. Pierzynowski, Tadeusz Studziński

EFFECTS OF ALPHA-KETOGLUTARATE GIVEN TO PREGNANT SOWS ON THE DEVELOPMENT OF THE HUMERUS AND FEMUR IN NEWBORNS

Alpha-ketoglutarate (AKG) was given to pregnant sows every day starting from the 91st day of pregnancy to the farrowing. At the same time control pregnant sows were treated in the same way with physiological saline (PhS). Newborn piglets from the experimental (AKG) and control (PhS) mothers were euthanised within 1 hour after their birth, and the femora and humeri were isolated and frozen at -25°C until further analyses. Using quantitative computed tomography (QCT) method, volumetric bone density of the cortical and trabecular bone compartments were estimated. Moreover, geometrical and mechanical parameters of the bones and the level of osteocalcin and alkaline phosphatase activity in serum were determined. It was found that the administration of AKG to pregnant sows during 24 days before parturition decreased bone density in their newborns.

Publication: Bull. Vet. Inst. Pulawy, 49, 117–121, 2005, tab. 2. In English, summary in English.

Ewa Śliwa, Sylwester Kowalik, Marcin R. Tatara, Piotr Majcher, Witold Krupski, Tadeusz Studziński

EFFECTS OF DEXAMETHASONE ON PHYSICAL PROPERTIES AND MINERAL DENSITY OF LONG BONES IN PIGLETS

The study was conducted to test the effect of dexamethasone introduced intramuscularly on volumetric mineral density and physical properties of the femur and humerus in piglets during 14 d of their neonatal life. The effective duration of dexamethasone action lasted together 38 d because sows were treated with dexamethasone during the last 24 d before farrowing. Control piglets were treated with physiological saline administered in the same way and amount. On the 14th d of life the piglets were euthanised and humeri and femora were isolated and frozen at -25°C until further analyses. Using quantitative computed tomography (QCT) method, volumetric bone density of the cortical and trabecular bone were estimated. Moreover, selected geometric and mechanical properties of the femur and humerus were determined. The obtained results indicate that the administration of dexamethasone in both prenatal and neonatal life of the piglets decreased volumetric bone density and mechanical and geometric properties of their bones.

Publication: Bull. Vet. Inst. Pulawy, 49, 97–101, 2005, tab. 1. In English, summary in English.

Ewa Śliwa, Marcin R. Tatar, Sylwester Kowalik, Witold Krupski, Piotr Majcher,
Tomasz Piersiak, Tadeusz Studziński

**INFLUENCE OF DEXAMETHASONE ON THE GROWTH AND THE MINERALISATION
OF SKELETAL SYSTEM IN PIGS DURING PRENATAL LIFE**

Wpływ deksametazonu na wzrost i mineralizację układu kostnego
w okresie prenatalnym u świń

The aim of the study was to establish the influence of dexamethasone on growth of long bones as femur and humerus in piglets during the last 24 days of prenatal life. The experiment was conducted during 24 last days of prenatal life. Using quantitative computed tomography (QCT) method and Somatom AR.T – Siemens apparatus the volumetric bone density of trabecular and cortical bone was determined separately. The mechanical properties were determined using three-point bending test according to the method by Ferretti et al. Using Norland XP-43 apparatus and DEXA method bone mineral content was estimated. The obtained results indicate that maternal administration of dexamethasone decreased volumetric mineral density, BMC, mechanical and geometric parameters of humeri and femora. This model of maternal administration of dexamethasone indicates that dexamethasone treatment at the dose of 3.0 mg per sow significantly inhibits bone growth and volumetric bone density in newborn piglets compared with control.

Publication: Medycyna Wet. (Lublin) 61, 1145–1149, 2005, tab. 5. In Polish, summary in English.

Ewa Śliwa, Marcin R. Tatar, Grzegorz S. Pierzynowski, Tadeusz Studziński

**INFLUENCE OF DEXAMETHASONE AND ALPHA-KETOGLUTARATE
ADMINISTRATION TO PREGNANT SOWS ON THE LEVEL OF SOME HORMONES
IN THE BLOOD PLASMA OF NEWBORN UN-SUCKLING PIGLETS**

Wpływ podawania deksametazonu i alfa-ketoglutaranu ciężarnym maciorom
na poziom wybranych hormonów we krwi noworodków

The aim of the study was to establish the influence of dexamethasone and alpha-ketoglutarate administration to pregnant sows on the prenatal programming of the growth hormone level, cortisol, insulin and IGF-I in the blood serum of newborn piglets assessed just after their birth and prior to suckling. The foetal development is dependent on and determined by hormones such as glucocorticoids as well as nutrient supply through the sow, especially from the digestive tract. All these factors determine pre- and neonatal growth. The experiment was conducted over the final 24 days of pregnancy in sows treated i.m. with dexamethasone at a dose of 3 mg per sow every second day or alpha-ketoglutarate administered orally daily at a dose of 0.4 g/kg b.w. The blood samples were collected from the subclavian vein of un-suckling piglets immediately after birth and were centrifuged straight away and the serum stored at -25°C until further analysis. Hormone concentrations were determined using ELISA kit. The obtained results indicate that maternal administration of dexamethasone increased the level of cortisol while alpha-ketoglutarate increased the levels of cortisol and IGF I whereas simultaneous administration of dexamethasone and AKG significantly increased the growth hormone. These results of separate or simultaneous maternal administration of dexamethasone and alpha-ketoglutarate during the last 24 days of pregnancy indicated the activation of different mechanisms and different prenatal effects on the levels of cortisol, growth hormone and IGF I in serum assessed immediately after piglets birth.

Publication: Medycyna Wet. (Lublin) 61, 1405–1408, 2005, tab. 2. In Polish, summary in English.

Ewa Śliwa, Marcin R. Tatar, Andrzej K. Siwicki, Barbara Badzian, Witold Krupski,
Iwona Łuszczewska-Sierakowska, Stefan G. Pierzynowski, Tadeusz Studziński

**SYNERGIC EFFECT OF DEXAMETASONE AND ALPHA-KETOGLUTARATE
ON THE HUMORAL DEFENSE MECHANISM IN THE PIG**

The experiment was carried out on pregnant sows and on their newborn piglets to establish the influence of dexamethasone and alpha-ketoglutarate acting prenatally and during the first 14 days of neonatal life on blood serum lysozyme and ceruloplasmin activity, total protein and total Ig level. The sows were treated *i.m.* with dexamethasone and AKG *per os* starting from the 91st day of pregnancy to the parturition day and in the same way the control group was given physiological saline. The ceruloplasmin activity in experimental newborns was lower than in the controls, while the level of total protein and gamma globulin were higher. At 72 hour and on 14 day of neonatal life lysozyme activity was higher. At the age of 14 days of neonatal life ceruloplasmin activity decreased in experimental piglets and the level of IgG was lower than in the controls.

Publication: Pol. J. Environ. Stud., suppl. II, 14, 363–366, 2005, tab. 1. In English, summary in English.

Marcin R. Tatar, Ewa Śliwa, Katarzyna Dudek, Andrzej Krzysztof Siwicki, Sylwester Kowalik, Iwona Łuszczewska-Sierakowska, Witold Krupski, Janusz Zipsper, Tadeusz Studziński

INFLUENCE OF PERINATAL ADMINISTRATION OF AGED GARLIC EXTRACT (AGE) AND ALLICIN TO SOWS ON SOME DEFENCE MECHANISMS IN THEIR PIGLETS DURING POSTNATAL LIFE

The aim of the study was to investigate the effect of aged garlic extract (AGE) and alliin administration to sows on humoral non-specific and specific defence mechanisms in piglets during postnatal life. AGE (10 ml/100 kg b.w./day) and alliin (1.6 mg/100 kg b.w./day) were administered to sows orally from the 91st day of pregnancy up to the piglets weaning on 28th day of their life. The blood samples were collected from the newborn piglets and at the age of 1, 3, 7, 14, 28, 35 and 56 days of life. The blood plasma was determined from the lysozyme and ceruloplasmin activity as well as from total protein and gamma-globulins concentration. The obtained results showed a positive effect of AGE and alliin on humoral non-specific and specific defence mechanisms in piglets.

Publication: Pol. J. Environ. Stud. 14, suppl. II, 378–381, 2005, fig. 3, tab. 1. In English, summary in English.

Ewa Śliwa, Marcin R. Tatar, Andrzej K. Siwicki, Tadeusz Studziński

LYSOZYME AND CERULOPLASMIN ACTIVITY IN BLOOD PLASMA OF PIGLETS UNDER THE PRENATAL AND NEONATAL INFLUENCE OF DEXAMETHASONE

The aim of this study was to establish the influence of dexamethasone administered *i.m.* to pregnant sows from the 91st day of pregnancy on lysozyme and

ceruloplasmin activity, total protein and total gammaglobulin level in blood serum of newborn piglets from these sows. The piglets were treated in the same way with dexamethasone starting from the 2nd neonatal day up to the 14th day of life. Dexamethasone administration during 24 last days of pregnancy decreased lysozyme activity in blood serum of newborn piglets comparing to the control. Lysozyme and ceruloplasmin activity 72 h after birth in dexamethasone treated piglets increased to 1.23 mg/l and to 89.2 IU/l in comparison with the control 0.45 mg/l and 61.5 IU/l respectively. At the age of 14th d of neonatal life ceruloplasmin activity was lower in dexamethasone treated piglets than in the controls. Moreover, lysozyme activity increased in Dex group to 1.93 mg/l while in the control was lower – 0.58 mg/l.

Publication: Pol. J. Environ. Stud., 14, suppl. II, p. I, 360–362, 2005, In English, summary in English.

Ewa Śliwa, Agata Wawrzyniak-Gacek, Marcin R. Tatała, Sylwester Kowalik,
Iwona Łuszczewska-Sierakowska, Witold Krupski, Piotr Majcher,
Grzegorz S. Pierzynowski, Tadeusz Studziński

**INFLUENCE OF DEXAMETHASONE AND ALPHA-KETOGLUTARATE
ON GROWTH AND DEVELOPMENT OF THE SKELETAL SYSTEM IN PIGS**

Wpływ deksametazonu i alfa-ketoglutaranu na wzrost i rozwój układu kostnego u świń

The aim of the study was to establish the influence of dexamethasone and/or alpha-ketoglutarate (AKG) on the growth, mineralization, geometric and mechanic properties of ribs as a methodological model. The experiment was conducted during the final 24 days of prenatal life and first 14 days of neonatal life. The volumetric bone density of the trabecular and cortical bone was determined separately using the quantitative computed tomography (QCT) method and Somatom AR.T-Siemens apparatus. The mechanical properties were established using the three-point bending test according to the method by Ferretti et al. The obtained results indicate that maternal administration of dexamethasone increased volumetric mineral density, although the mechanical parameters had lower values. Prenatal administration of AKG decreased all the geometric and mechanical parameters of the investigated ribs. The results obtained during the administration of the compound in neonatal life were the opposite to the prenatal results. Dexamethasone and AKG given together had the same influence on mineralization and other properties, increasing their values during prenatal and neonatal life. This model of administration of dexamethasone and AKG mater-

nally during prenatal life aiming at provoking structural growth of the skeleton may be useful in further elucidating some biological and pharmacological factors on bone formation in prenatal life.

Publication: Medycyna Wet. (Lublin) 61, 526–531, 2005, fig. 1, tab. 6. In Polish, summary in English.

Marcin R. Tatar, Adam Brodzki, Witold Krupski, Ewa Śliwa, Piotr Silmanowicz, Piotr Majcher, Stefan G. Pierzynowski, Tadeusz Studziński

**EFFECT OF ALPHA-KETOGLUTARATE ON BONE HOMEOSTASIS
AND PLASMA AMINO ACIDS IN TURKEYS**

The objective of the study was to evaluate the effect of denervation and alpha-ketoglutarate (AKG) administration on the development of osteopenia in the turkey radius. On 22 day of age, all turkeys were subjected to neurectomy to induce osteopenia of the right radius. Control turkeys were given a saline solution into the crop for 97 days. Experimental turkeys were given 0.4 g AKG per kg BW into the crop every day. After 98 days, BW was not affected by the AKG treatment. Volumetric bone mineral density of the radius was measured by quantitative computed tomography. Mechanical properties were tested using a three-point bending test. Cross-sectional area, second moment of inertia and mean relative wall thickness were measured as well. Amino acids concentration was assessed with the use of ion-exchange chromatography. Denervation had a negative effect on all bone characteristics that were measured, except bone length. AKG had a positive effect on all bone characteristics except bone length. Plasma concentration of proline and leucine increased by AKG, while concentrations of taurine and glutamine decreased. The turkey radius appears to be a good model for studying osteopenia, because its development can be affected by treatments such as denervation and AKG administration.

Publication: Poultry Sci. (Savoy) 84, 1604–1609, 2005, tab. 3. In English, summary in English.

Marcin R. Tatar, Witold Krupski, Piotr Majcher, Tadeusz Studziński

**LONG-TERM DENERVATION OF THE HUMERUS IN TURKEYS
AS AN EXPERIMENTAL MODEL FOR OSTEOPENIA**

The aim of this study was to evaluate the influence of long-term denervation on volumetric bone mineral density, and geometrical and mechanical properties

of the humerus in turkeys. The experiment was conducted from the 22nd day after hatching until the seventeenth wk of life. All experimental birds (male turkeys) were randomly divided into two weight-matched groups. While the first group of turkeys served as the control group and underwent sham operation on the right wing, the second group was subjected to surgical denervation of the right humerus. The denervation of this bone was performed by neurectomy of the radialis and the mediano-ulnaris nerves in the region of the proximal epiphysis of the humerus. All the left wings within both groups were surgically untouched. The left humerus served as the control bone to the right humerus in both investigated groups. Effect of denervation of humerus was determined in terms of geometrical and mechanical properties and quantitative computed tomography (QCT). The denervation of humerus in turkeys significantly decreased volumetric bone mineral density, and geometrical and mechanical properties of this bone, when compared to the results obtained in humerus from the sham operated or surgically untouched wings. However, no significant differences between right and left humerus were observed while analyzing all of the investigated parameters in the sham operated group of turkeys. It is concluded that long-term denervation of humerus in turkeys induces osteopenia and may serve as a new experimental model for investigating factors that affect skeletal homeostasis in poultry and other vertebrates.

Publication: Poultry Sci. (Savoy) 84, 718–722, 2005, tab. 1. In English, summary in English.

Marcin R. Tatara, Nel Sierant-Rozmiej, Witold Krupski, Piotr Majcher, Ewa Śliwa, Sylwester Kowalik, Tadeusz Studziński

**QUANTITATIVE COMPUTED TOMOGRAPHY FOR THE ASSESSMENT
OF MINERALIZATION OF THE FEMUR AND TIBIA IN TURKEYS**

Zastosowanie ilościowej tomografii komputerowej w ocenie mineralizacji
kości udowej i piszczelowej indyka

This investigation was motivated by the lack of information on skeletal system properties in poultry under current farming conditions. The aim of the study was to estimate mineralization, geometrical properties and mechanical endurance of femur and tibia in female turkeys. The analyses were performed on left and right bones obtained from 33 turkeys that were slaughtered at the age of 19 weeks. The comparison of the femur and tibia was performed as well. Using a quantitative computed tomography (QCT) method and Somatom AR. T – Siemens apparatus the volumetric bone density of the trabecular and cortical

bones were determined separately. The mechanical properties were determined in Zwick/Roell apparatus using the three-point bending test. The geometrical properties of the investigated bones were assessed according to the method described by Ferretti et al. The obtained results indicate that due to the higher volumetric density of the trabecular and cortical bones, as well as geometrical properties, the tibia was characterized by a higher mechanical endurance to acting forces than the femur. These differences in mechanical and geometrical properties and mineralization designate the tibia as a better bone for investigation purposes than the femur in turkeys. The observed differences should be taken into consideration when one or both of these bones are destined for radiological, mechanical, mineral and geometrical assessment. Moreover, the QCT method may be applied in the future as a non invasive but reliable method in research aimed at breeding selection and diagnostic investigation of poultry.

Publication: Medycyna Wet. (Lublin) 61, 225–228, 2005, fig. 2, tab. 1. In Polish, summary in English.

Marcin R. Tatar, Piotr Silmanowicz, Piotr Majcher, Witold Krupski,
Tadeusz Studziński

INFLUENCE OF ALPHA-KETOGLUTARATE ON CORTICAL BONE ATROPHY AFTER DENERVATION OF THE HUMERUS IN TURKEY

The purpose of this study was to determine the influence of alpha-ketoglutarate (AKG) daily administration via digestive tract on cortical bone loss. Due to structural and physiological properties, the study was executed on humerus model in turkey. The neurectomy of the radialis and the medianoulnaris nerves was applied to induce osteopenic effect in right humerus of turkeys. The experiment was conducted from 22nd day after hatching, when the turkeys were subjected to neurectomy and AKG administration was started (0.4 g/kg b.w./day). After 14 weeks of the experiment, the animals were sacrificed. Right and left humeri were X-rayed, isolated and frozen at -25°C until further analyses. Using quantitative computed tomography (QCT) method, volumetric bone density of the cortical bone compartment was estimated. Moreover, geometrical and mechanical properties of the investigated bones were determined. The obtained results indicate that AKG daily administration inhibits cortical bone loss induced by denervation of humerus in turkey.

Publication: Bull. Vet. Inst. Pulawy 49, 113–116, 2005, tab. 1. In English, summary in English.

Marcin R. Tatar, Ewa Śliwa, Katarzyna Dudek, Jerzy Mosiewicz, Tadeusz Studziński

**EFFECT OF AGED GARLIC EXTRACT AND ALLICIN ADMINISTRATION
TO SOWS DURING PREGNANCY AND LACTATION ON BODY WEIGHT GAIN
AND GASTROINTESTINAL TRACT DEVELOPMENT OF PIGLETS. PART I**

The aim of this study was to investigate the influence of perinatal administration of aged garlic extract (AGE) and allicin to pregnant sows on body weight gain and gastrointestinal tract development in their piglets. The animals were kept under standard rearing conditions and fed well balanced diet *ad libitum*. The piglets were obtained from 18 sows and divided into 3 equal experimental groups. Moreover, the experimental animals were divided additionally into 8 age-differentiated subgroups, namely non-suckling newborn piglets and piglets 1, 3, 7, 14, 28, 35, and 56 d of age. Starting from the 91st d of pregnancy up to the piglets weaning on the 28th d of their life, the sows were daily treated *per os* with AGE or allicin, whereas the control group received the vehiculum. Daily body weight gain was estimated. To determine the weight of internal organs and length of the small intestine, the piglets were sacrificed according to the experimental design and the gastrointestinal tract was isolated. The positive influence of AGE and allicin administered to pregnant and lactating sows on body weight gain and gastrointestinal tract development of piglets was demonstrated. It seems that garlic supplements may be considered as an attractive alternative for antibiotics that are widely used in pig nutrition.

Publication: Bull. Vet. Inst. Pulawy, 49, 349–355, 2005, tab. 6. In English, summary in English.

Marcin R. Tatar, Ewa Śliwa, Katarzyna Dudek, Sylwester Kowalik, Antoni Gawron,
Tomasz Piersiak, Piotr Dobrowolski, Tadeusz Studziński

**EFFECT OF AGED GARLIC EXTRACT AND ALLICIN ADMINISTRATION
TO SOWS DURING PREGNANCY AND LACTATION ON BODY WEIGHT GAIN
AND GASTROINTESTINAL TRACT DEVELOPMENT OF PIGLETS: MORPHOLOGICAL
PROPERTIES OF THE SMALL INTESTINE. PART II**

This investigation was undertaken to continue our earlier studies performed on piglets born by sows that were treated with aged garlic extract (AGE) and allicin during the last 24 d of pregnancy and during 28 d of lactation. To explain whether improved systemic development of piglets from sows treated with AGE or allicin observed previously is connected with changes of gastrointestinal tract on microstructural level, the morphological properties of the small intestine were determined. Piglets were obtained from 18 sows and divided into 3 equal experimental groups. The experimental piglets were divided additionally into 8 age-differentiated subgroups, namely non-suckling newborns and 1, 3, 7, 14, 28, 35, and 56 d old piglets. Starting from the 91st d of pregnancy up to the piglet weaning on 28th d of their life, the sows were daily given *per os* with AGE or allicin, whereas the control group received the vehiculum. Morphometric measurements of villus height, villus width at villus base, villus section area, crypt (gland) depth and mucosa thickness were performed automatically under confocal microscope. Moreover, villus number per cm of cross section of each investigated intestine sample was estimated. This study revealed that administration of allicin and AGE to pregnant and lactating sows induced beneficial effects on morphological parameters of villi investigated in different parts of the small intestine and during various developmental stages of their offspring. These effects seem to be dependent on the age of the animals and the examined part of the small intestine. The most readable changes in villus morphology were induced by AGE and allicin in piglets between 7 and 35 d of life. Moreover, the most significant response of the intestine to experimental factors was observed in 50 and 75% of jejunum length as well as in the ileum. In conclusion, increased surface of the small intestine, as a positive consequence of allicin and AGE administration may be postulated as factors responsible for their improved systemic development. Moreover, the results obtained confirmed that improved nutrition at early stages of postnatal development, and as the major intrauterine environmental factor, may be beneficial not only after the birth but may have lifelong consequences, leading to the permanent changes of the structure, physiology, and metabolism of offspring.

Publication: Bull. Vet. Inst. Pulawy, 49, 455–464, 2005, fig. 1, tab. 5. In English, summary in English.

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Publication: Bone 36, 392–393, 2005, In English.

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Publication: Bone 36, 393, 2005, In English.

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Ref: V Baltic Bone and Cartilage Conference. Naantali, 1–3 IX 2005.
Publication: Proceedings of V Baltic Bone and Cartilage Conference 146–147, 2005, In English.

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RESEARCH STUDIES (SUMMARIES)

Maciej Łopucki, Ivo Schmerold, Agnes Dadak, Henryk Wiktor, Hans Niedermueller,
Marta Kankofer

LOW DOSE MAGNETIC FIELDS DO NOT CAUSE OXIDATIVE DNA DAMAGE IN HUMAN PLACENTAL COTYLEDONS IN VITRO

The biological impact of low dose magnetic fields generated by electric appliances present in the human environment is still uncertain. In this study, human placentas served as a model tissue for the evaluation of the potential effect of oscillating low intensity magnetic fields on the concentration of 8-hydroxy-2'-deoxyguanosine (8-OH-dG) in cellular DNA. Cotyledons were dissected from placentas obtained immediately after physiological labours and exposed to magnetic fields (groups MF A, 2 mT, 50 Hz and MF B, 5 mT, 50 Hz) or sham exposed (group C) during an in vitro perfusion of 3 h. Cellular DNA was isolated, hydrolyzed and analyzed by HPLC. Native nucleosides were monitored at 254 nm and 8-OH-dG by electrochemical detection. Results were expressed as μmol 8-OH-dG/mol deoxyguanosine (dG). The concentrations of 8-OH-dG in group C, MF A and MF B were $28.45 \pm 15.27 \mu\text{mol/mol dG}$, $62.80 \pm 31.91 \mu\text{mol/mol dG}$, and $27.49 \pm 14.23 \mu\text{mol/mol dG}$, respectively, demonstrating no significant differences between the groups. The results suggest that placental tissues possess a capacity to protect DNA against oxidative alterations by magnetic field of intensities previously shown to produce radical mediated DNA damage in rat brain cells in vivo and imbalances in electrolyte release of cotyledons under in vitro conditions.

Publication: Virchows Arch. 445, 634–639, 2005, fig. 1, tab.1. In English, summary in English.

Maciej Łopucki, Wanda Rogowska, Jan Kotarski, Stanisław Pietruszewski,
Marta Kankofer

**STUDIES ON THE INFLUENCE OF OSCILLATING MAGNETIC FIELD
OF 50 HZ FREQUENCY ON *IN VITRO* PERFUSED HUMAN PLACENTA**

Badania nad wpływem zmiennego pola magnetycznego o częstotliwości 50 Hz
na perfundowany w warunkach *in vitro* zrazik łożyska ludzkiego

External perfusion *in vitro* is one of the methods for the evaluation of harmful influence of xenobiotics on human placenta. The studies on the influence of oscillating magnetic field with magnetic induction of 0.5 mT, 2 mT, 5 mT and frequency of 50 Hz, on internal temperature of cotyledon, placental pH as well as arterial resistance were performed using the mentioned above experimental model during 180 min of perfusion.

It was concluded that magnetic fields used did not disturb internal placental temperature. They, however, increased the release of H⁺ from perfused *in vitro* cotyledon to venous fetal circulation and caused an increase of the arterial resistance during 180 min of experiment.

Publication: Polish Symposium of Telecommunication 2005 (Krajowe Sympozjum Telekomunikacji 2005), p. B pp. 97–106. Ed. by The Institute of Telecommunication, Warsaw Polytechnic. In Polish, summary in Polish.

Witold Kędzierski

**THE EFFECT OF INTENSITY EXERCISE ON SOME HEMATOLOGICAL
AND BIOCHEMICAL BLOOD PARAMETERS IN ARABIAN HORSES**

Wpływ intensywnego wysiłku na wybrane wskaźniki biochemiczne krwi
koni rasy arabskiej

The aim of this study was to evaluate the effect of sex on blood levels of red blood cells (RBC), hemoglobin (Hb), lactic acid (LA), glucose (Glc), triacylglycerides (TG), total plasma proteins and urea during intensity exercise. Three-year-old Arabian stallions (n = 20) and mares (n = 18) were observed during their race-training. Blood samples were taken at rest, immediately after exercise and 30 minutes after the last sampling. The higher increase of plasma Glc and proteins was noted just after exercise in mares, compared to stallions. The differences in the levels of LA, Hb, Glc and TG were observed also 30 minutes after the end of training in two investigated groups of horses. The exercise of the

same intensity affected the mare metabolism to a higher degree than the stallion's one.

Publication: Acta Sci. Pol., Med. Vet. 4, 113–119, 2005, fig. 2, tab. 1. In Polish, summary in English.

Marta Kankofer, Gabriela Kolm, Joerg Aurich, Christine Aurich

**ACTIVITY OF GLUTATHIONE PEROXIDASE, SUPEROXIDE DISMUTASE
AND CATALASE AND LIPID PEROXIDATION INTENSITY
IN STALLION SEMEN DURING STORAGE AT 5°C**

Sperm cell membranes are susceptible to peroxidative damage by an excess of reactive oxygen species (ROS). Antioxidative defence systems consisting of glutathione peroxidase (GSH-Px), superoxide dismutase (SOD) and catalase (CAT) physiologically control the balance between ROS production and neutralization. In the present study the hypothesis was tested that lipid peroxidation occurs during storage of semen at 5°C and that semen extender has positive effects on the antioxidative potential of equine semen. The aim of the study was to determine the activity of GSH-Px, SOD and CAT and the concentration of thiobarbituric reactive substances (TBARS) as an indicator of lipid peroxidation in native semen and after addition of extender, cooling and storage. Semen was collected from fertile Shetland stallions. In experiment 1, activity of antioxidative enzymes was determined immediately after semen collection and after 24 h storage at 5°C. Enzyme activities were measured in native semen, semen diluted with semen extender, spermatozoa resuspended after centrifugation in extender and 0.9% NaCl as well as in undiluted and extender-diluted seminal plasma. In experiment 2, TBARS concentrations were analysed during storage of semen at 5°C for 24 h. Semen storage for 24 h at 5°C did not change activity of the examined enzymes. Antioxidative activity was significantly higher in extended than in native semen as well as in extended plasma than in undiluted plasma. In conclusion, the addition of semen extender increases the antioxidative activity in seminal plasma of stallions. Basal antioxidative activity in native semen as well as increased activity in extended semen are maintained over 24 h storage at 5°C. TBARS content did not increase during semen storage. In conclusion, lipid peroxidation does not increase substantially during semen storage. The enzymatic antioxidative activity in semen apparently prevents ROS formation and is further increased by addition of semen extender.

Publication: Theriogenology 63, 1354–1364, 2005, fig. 4. In English.

Marta Kankofer, Sławomir Zduńczyk, Justyna Lipko

TOTAL ANTIOXIDANT CAPACITY OF BOVINE SPONTANEOUSLY RELEASED AND RETAINED PLACENTA

Exposure of living organisms to a constant generation of reactive oxygen species (ROS) resulted in the development of antioxidative defence systems which protect cells and tissues against their harmful effects. The retention of fetal membranes (RFM) in cows is hypothesized to be connected with the imbalance between production and neutralization of ROS. The efficiency of enzymatic and non-enzymatic antioxidative systems can be detected by the determination of single components of this system or by so-called total antioxidant capacity (TAC). In the present study, total antioxidant capacity was compared with previously measured parameters of antioxidative defence mechanisms in placental tissues of cows with respect to time of fetal membranes expulsion and mode of delivery. Placental samples were divided into: (A) caesarian section before term (272–277 days of pregnancy) without RFM (n = 9), (B) caesarian section before term with RFM (n = 14), (C) caesarian section at term (282–288 days of pregnancy) without RFM (n = 12), (D) caesarian section at term with RFM (n = 16), (E) spontaneous delivery at term without RFM (n = 8), (F) spontaneous delivery at term with RFM (n = 8). TAC was measured spectrophotometrically at 593 nm by use of 2,4,6-tri-pyridyl-s-triazine in homogenates of maternal and fetal part of placenta and expressed as $\mu\text{mol/g}$ protein (mean \pm S.E.M). The values of TAC were significantly higher ($P < 0.05$) in the fetal than in maternal part in preterm samples (A – maternal: 27.24 ± 4.17 $\mu\text{mol/g}$ prot, fetal: 63.67 ± 18.16 , B – maternal: 49.80 ± 5.11 , fetal: 70.96 ± 13.23). The opposite relationship was noticed in term samples. Significantly higher values were observed in retained than in not retained placental tissues (C – maternal: 32.40 ± 6.12 , fetal: 16.29 ± 3.97 , D – maternal: 48.17 ± 6.91 , fetal: 27.92 ± 4.72 , E – maternal: 40.55 ± 2.66 , fetal: 27.90 ± 1.23 , F – maternal: 45.85 ± 6.40 , fetal: 43.50 ± 4.61). Values of TAC are comparable with previously determined single parameters of antioxidative defence mechanisms in placental tissues and may be of clinical importance. Whether they reflect plasma values as well, requires further evaluation.

Publication: Pathophysiology 11, 215–219, 2005, fig. 1, tab. 1. In English.

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Ref. XXXVIII Jahrestagung über Physiologie und Pathologie der Fortpflanzung gleichzeitig

XXX Veterinär-Humanmedizinische Gemeinschaftstagung, Zurich, Switzerland, 10–11 II 2005.

Publication: Schweizer Archiv Tierheilkunde 117, 63, 2005. In English.

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Ref. VIII International Congress of Andrology, Seoul, Korea, 12–16 VI 2005.
Publication: Int. J. Androl. 28, suppl 1, P 157, 2005, In English.

DEPARTMENT AND CLINIC OF ANIMAL INTERNAL DISEASES

30 Głęboka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Marcin Gołyński, Leszek Szewczyk, Piotr Dębiak, Dorota Pomorska, Tadeusz Narojek

CANINE PITUITARY DWARFISM – A CASE REPORT

Karłowatość przysadkowa psów – opis przypadku

The study demonstrated the diagnostic course of a German shepherd dog which was apparently suffering from dwarfism. The complete clinical diagnosis, additional dermatological diagnosis, urinalysis, hematological diagnosis, biochemical diagnosis of serum, radiological diagnosis, measurement of IGF-I, a test with xylazine and diagnosis of the pituitary gland by means of magnetic resonance (MR) were carried out. The value of the insulin-like growth factor I was 5.6 ng/ml. The pituitary gland did not produce somatotropine after xylazine application. Magnetic resonance demonstrated the existence of abnormal structures of the pituitary gland indicating its underdevelopment. Canine pituitary dwarfism was caused by the reduced level of IGF-I resulting from the isolated deficiency of the growth hormone due to underdevelopment of the pituitary gland.

Publication: Medycyna Wet. (Lublin) 61,1186–1189, 2005 In Polish, summary in English.

Łukasz Kurek, Adam Stec

THE INFLUENCE OF THE PERINATAL PERIOD AND AGE ON THE LEVELS OF THE SELECTED MACROELEMENTS, INDICATORS OF PARENCHYMA ORGANS AND LEVEL OF FREE FATTY ACIDS IN HEALTHY DAIRY COWS

Wpływ okresu okołoporodowego i wieku na zawartość wybranych makroelementów, wolnych kwasów tłuszczowych oraz wskaźników funkcji narządów mięsowych zdrowych krów mlecznych

In the present medical examination the research workers investigated twelve dairy cows, which were divided into two groups considering their age. The first group was composed of six individuals at the age of 2.5–4 years old and the second group of six cows at the age of 6–10. The clinical condition and dynamics of changes of selected macroelements (Ca, Mg, Na, K, Pi) with regard to ionized fractions, indicators of liver, kidney and motor organ (ALT, AST, AP, urea, total bilirubin, FFA) in the period of a week before and after the parturition were analyzed. The clinical examination, in direct period after parturition in cows at the age of 2.5–4, proved the condition of increased susceptibility to different impulses, which was particularly visible at the moment of contact with the staff. Cows at the age of 6–10 during this period lay in a recumbent posture longer and more willingly. Parturition and the outset of lactation had the influence on appearance of hypocalcemic and hypophosphatemic content in both cow groups' blood, yet of greater exacerbation and lasting for longer time in the case of cows at the age of 6–10. At this period there was also considerable increase of magnesium content in plasma, particularly in the group of cows at the age of 2.5–4, however not exceeding physiological norms. The level of plasma FFA increased significantly after the parturition, which was particularly visible in a group of cows at the age of 6–10. Such a situation was also observed in formation of total bilirubin levels. On the ground of obtained results it was stated that parturition and initial lactation in healthy cows have a significant impact on the clinical condition and dynamics of the changes of the examined parameters. Greater exacerbation of changes in the dynamics of examined elements was proven, particularly in the calcium, phosphorus and FFA level in the group of cows at the age of 6–10.

Publication: Annales UMCS (Lublin), sectio DD 60, 37–54, 2005. In Polish, summary in English.

Łukasz Kurek, Adam Stec

PARATHYROID HORMONE LEVEL IN BLOOD OF COWS WITH DIFFERENT FORMS OF CLINICAL HYPOCALCEMIA

The research was intended to determine the parathyroid hormone (PTH) level in various forms of clinical hypocalcaemia in dairy cows with the use of immunochemiluminometric assay (ICMA), routinely applied in humans for the measure of the hormone. The study was conducted on 59 cows of the lowland black-and-white and HF breeds, as well as crossbreds. Symptoms of clinical hypocalcaemia were confirmed in 47 animals. The symptoms occurred in the animals during the post-calving period, i.e. from several hours to about a week after calving. The cows demonstrated a negative correlation with the low values of total calcium symptoms in the serum with the exception of the group of downer cows. The lowest PTH levels were confirmed in the downer cows, in which no beneficial effects of medical treatment were noted. The ICMA with human antibodies also proved valid for measuring the level of PTH in cows. It is a relatively inexpensive and fairly quick method.

Publication: Bull. Vet. Inst. Pulawy. 49, 129–132, 2005. In English, summary in English.

Jacek Madany, Józef Filar, Hubert Nowakowski

EVALUATION OF POST MORTEM AQUEOUS HUMOUR UREA LEVEL ESTIMATION FOR DIAGNOSIS OF URAEMIA IN DOGS

Przydatność pośmiertnego oznaczania stężenia mocznika w płynie przedniej komory oka w rozpoznawaniu mocznicy u psów

Uraemia is the final stage of renal insufficiency. The ante mortem identification of uraemia is not always possible, but recognition of death origin is sometimes necessary e.g. for legal purposes. The aim of this study was to evaluate post mortem estimation of urea level for diagnosis of uremia in dogs. The research was made on 12 dogs with recognized ante mortem renal failure and uraemia. Blood was collected ante mortem and the aqueous humour was taken up to 6 hours post mortem.

In uraemic dogs mean serum urea level was 38.2 ± 27.5 , in aqueous humour 34.5 ± 29.6 mmol/l. These values were significantly higher than those of control group. Mean values for the control were 4.46 ± 1.37 for serum urea levels, and 3.86 ± 1.16 mmol/l for aqueous humour level. Statistical analysis of uraemic group revealed significant positive correlation ($r = 0.97$) between urea levels in aqueous humour and serum. This association is stronger than for control group ($r = 0.89$). This survey has proved that post mortem urea level in aqueous hu-

mour is significantly correlated with its ante mortem serum level and that post mortem urea level determination in aqueous humour can be a helpful diagnostic procedure for uraemia evaluation in dogs.

Publication: Annales UMCS (Lublin), sectio DD, 60, 16–21, 2005. In Polish, summary in English.

Jacek Madany, Andrzej Milczak

TETANUS IN DOGS – THE PRACTICAL OBSERVATIONS

Tężec u psów – obserwacje własne

Tetanus is highly mortal, septic wound toxoinfection caused by anaerobic bacteria's *Clostridium tetani*. The work describes 3 cases of tetanus in dogs. The disease appeared 14–20 days after injury as after-effect of contagions of the wound. Tetanus in all cases had a generalized character and proceeded with specific nervous signs. Additionally severe complicating symptoms as swelling, pneumonia and in the case of two dogs, cardiac arrhythmia appeared due to failure of the respiratory and circulatory systems. Intensive treatment did not bring any results. All dogs died between 3rd to 7th day of treatment. The cases described in this paper prove real possibility of this disease incidence in dogs as a consequence of wound infection or nonsterile surgical procedures.

Publication: Medycyna Wet. (Lublin) 61, 90–93, 2005. In Polish, summary in English.

Adam Stec, Jacek Mochol, Łukasz Kurek, Grażyna Wałkuska,
Agnieszka Chałabis-Mazurek

THE INFLUENCE OF DIFFERENT FACTORS ON SELENIUM LEVELS IN DAIRY COWS HERDS IN THE CENTRAL-EASTERN REGION OF POLAND

Selenium is at present recognised as a basic bioelement that determines normal development and health of both animals and humans. Data of many authors showed the influence of selenium deficiency on immunity, health, reproduction and production of dairy cows. Selenium deficiency has been reported in a number of countries, for example in different regions of Poland. The aim of the study

was to determine the Se levels in blood serum of dairy cows in the Lublin region. In the periods: autumn 2003, winter 2003 and autumn 2004 selenium concentrations were investigated in serum samples from 180 dairy cows. The samples were obtained from 11 farms. The selenium concentrations were estimated with the ASA method. The monitoring studies have showed that Se levels are dependent on season of the year, physiological period, management and system of feeding. Mean selenium levels observed in the study were between 0.21–0.92 $\mu\text{mol/l}$, especially ($\mu\text{mol/l}$): lactation 0.74 ± 0.13 , non-lactating period 0.67 ± 0.15 , autumn 2003 0.38 ± 0.17 , winter 2003 0.48 ± 0.16 , autumn 2004 0.69 ± 0.18 . These results show that selenium should be supplemented, especially in high-producing dairy cows herds.

Publication: Pol. J. Vet. Sci. 8, 225–229, 2005. In English, summary in English.

Adam Stec, Marcin Szczepanik, Marcin Gołyński, Łukasz Kurek,
Jacek Mochol, Anna Śmiech

STUDIES ON OUTBREAKS OF DERMATOPHILOSIS IN DAIRY CATTLE

Dermatofiloza w hodowli bydła mlecznego na terenie Lubelszczyzny

Dermatophilosis is an exudative disease of the skin which often occurs in some regions of the world. The etiological agent of the disease is *Dermatophilus congolensis*. The aim of the study was to confirm the occurrence of dermatophilosis in dairy cattle in the Lublin region and to describe diagnostic and therapeutic procedures which would not disturb milk production. Diagnosis was based on characteristic clinical symptoms, the presence of microbes on cytology slides and micro-organism culture. The study confirmed positive results of a local therapy, based on iodine medication.

Publication: Medycyna Wet. (Lublin) 61, 290–292, 2005, In Polish, summary in English.

Marcin Szczepanik

**IMMEDIATE HYPERSENSITIVITY IN CATTLE NATURALLY INFECTED
BY TRIHOPHYTOSIS**

Nadwrażliwość typu natychmiastowego w przebiegu naturalnej trichofityzy bydła

The aim of this study was to evaluate immediate hypersensitivity in cattle naturally infected by trihophytosis. All research was done on group of 24 ill animals and on 6 control animals. The skin tests and basophils degranulation test was performed in all diseased and control animals. The positive reaction in both tests was noticed in 58,34% of ill animals. We also noticed the strong correlation between results of skin tests and basophils degranulation test. Our data confirm the development of specific immediate type hypersensitivity in cattle naturally infected by *Trichophyton verrucosum*.

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Marcin Szczepanik, Piotr Wilkołek, Iwona Taszkun, Zbigniew Pomorski

**CANINE ATOPIC DERMATITIS AND ALLERGENS RESPONSIBLE
FOR SENSITIZATION DEVELOPMENT**

Atopowe zapalenie skóry psów w świetle alergenów odpowiedzialnych
za rozwój uczulenia

The purpose of the study was assessment of the hypersensitivity of the dogs affected by atopic dermatitis on the basis of intradermal test results in 1999–2003. The studies were done on 81 atopic dermatitis affected dogs, using 16 allergen extracts aqueous solution: *Ctenocephalides felis*, *Alternaria tenuis*, *Microsporum canis*, *Aspergillus fumigatus*, *Rhizopus nigricans*, *Dermatophagoides farinae*, *Dermatophagoides pteronyssinus*, grasses, weeds, animals fur, moulds, cats epithelium, cotton, trees, sheep wool, grains. Most of the positive reaction was observed to house dust mites allergens (*Dermatophagoides farinae* 93,8% of the positive reaction, *D. pteronyssinus* 66.7% of the positive reaction) the second were moulds allergens (71.6% of the positive reaction). Most of the positive reactions were polyvalent (97.53%), we noticed only few monovalent one.

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Publication: Medical Tribune Polska, Warszawa 12–13, 2005. In Polish.
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Publication: Pol. J. Vet. Sci. 8, 329–335, 2005. In English.

DEPARTMENT AND CLINIC OF ANIMAL REPRODUCTION

30 Głęboka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Leszek Krakowski, Zygmunt Wrona, Izabela Krakowska, Łukasz Kurek,
Krzysztof Kostro, Adam Stec, Piotr Brodzki, Renata Urban-Chmiel

LEVEL OF CORTISOL AND Ca, Mg, Na, K IN HEIFERS DURING THE ESTRUS CYCLE, PREGNANCY AND AFTER CALVING FROM THE PERSPECTIVE OF PLACENTA RETENTION

Stężenie kortyzolu oraz poziom Ca, Mg, Na i K u jałówek w cyklu rujowym,
ciąży i po porodzie w aspekcie zatrzymania łożyska

The objective of the studies was to determine the serum level of cortisol and macroelements in heifers during the ovarian cycle, at different stages of pregnancy and after calving from the perspective of the development of post-parturient disorders. The animals were divided into two groups: heifers without placenta retention in group A (n = 18) and heifers with the retention of the placenta in group B (n = 7). Significant differences in serum level of cortisol between the two groups of heifers were observed not discerned throughout the entire experiment. However statistically significant differences in the serum level of cortisol were observed between different phases of the ovarian cycle,

trimesters of pregnancy and after calving in each group of animals. A deficit of Mg, Ca, Na and K was discovered in heifers with placenta retention.

Publication: Medycyna Wet. (Lublin) 61, 191–193, 2005, tab. 2. In Polish, summary in English.

Roland Kusy, Aleksandra Suszka-Świtek

PINEAL AND OVARIAN FUNCTION AND FERTILITY AFTER DEPOT FORM OF GnRH ANALOGUE TREATMENT OF MARES WITH ANAPHRODISIA WHICH FOALD IN JANUARY-FEBRUARY

Wpływ analogu GnRH w formie depot na czynność przysadki mózgowej, jajników i płodność klaczy z anafrodyzją po wyźrebieniu w styczniu-lutym

The aim of the study was to estimate the pineal and ovarian function and fertility after depot form of GnRH analogue (dalarelin suspension) treatment of mares with postparturition anaphrodisia early in the breeding season (January-February). The experiment was performed on 12 Arabian mares with normal pregnancy and foaling without any postparturition complications but with no signs of first heat after parturition. Mares were divided into experimental ($n = 6$) and control ($n = 6$) groups. The experimental mares on 17 ± 4.56 days after parturition when follicle reached 3.32 ± 0.41 cm diameter were given suspension of dalarelin intramuscularly in dose $0,1 \mu\text{g}/\text{kg}$ b.m., testing series, Biochefa. In the case of ovulation lack, injection of hormone was repeated after 24 hours. The mares were bred with cooled semen. In the mares sexual behavior, the development of follicles and ovulations were monitored. The serum of the mares was examined to estimate the concentration of LH, 17β -estradiol, progesterone. The same procedure was performed on 14.5 ± 4.85 days after parturition when follicle reached 3.24 ± 0.18 cm diameter in mares from control group, without dalarelin suspension administration.

Maximum serum concentrations of LH detected in 1 h following dalarelin suspension injection were higher compared to control mares ($p \leq 0.01$). In all mares with anaphrodisia, serum concentrations of 17β -estradiol were low but after GnRH analogue injection concentrations were higher than in control group. Low concentration of progesterone was observed 5 days after ovulation in 1 experimental and 2 control mares which indicated an insufficient function of corpus luteum in these animals. The ovulation occurred after approximately 50.15 ± 49.32 h following the first injection of GnRH analogue and after 74 ± 17.84 h in control group. The number of breedings per mare was lower in the experimental group (1.67 ± 1.21) than in control group (2.3 ± 0.52). The develop-

ment of normal pregnancies till 80 day after ovulation was detected in 5 (83.3%) experimental and 4 (66.7%) control mares.

Publication: Medycyna Wet. (Lublin) 61, 220–224, 2005, fig. 4. In Polish, summary in English.

Roland Kusy, Anna Śmiech, Wojciech Łopuszyński, Marek Szczubiał,
Roman Dąbrowski, Jacek Krasucki, Władysław Wawron

CLINICAL AND HISTOLOGICAL CHARACTERIZATION OF OVARIES TUMORS IN BITCHES

Kliniczna i histologiczna charakterystyka nowotworów jajników u suk

The paper presents clinical course of neoplasms process situated in ovaries and histological and immunohistochemical characterization of tumors of ovaries in 16 bitches. Greatest frequency of occurrence of ovary tumors was shown in bitches 9 years old. In 11 (68.75%) cases illness had asymptomatic course, and in 5 (31.25%) a differentiated clinical picture was noted. Among 16 diagnosed tumors of ovary in 10 (62.5%) cases it was granulosa cell tumor (GCT), in 3 (18.75%) cystoadenoma, in 2 (12.5%) adenocarcinoma and in 1 (6.5%) teratoma. In the investigation immunohistochemical positive reaction to wimentyn presence was stated in cells GCT, medium intensive and distinct expression of estrogen receptor in GCT and adenoma. In 13 (81.25%) cases favourable elimination of process was recorded and in 3 (18.75%) it ended with euthanasia or death.

Publication: Medycyna Wet. (Lublin) 61, 775–780, 2005, fig. 19, tab. 1. In Polish, summary in English.

Władysław Wawron, Tomasz Piech, Roman Dąbrowski, Jacek Krasucki

IMPACT OF FERRIC PREPARATIONS ADMINISTRATION ON HEALTH AND SOME HEMATOLOGIC AND IMMUNE INDICES OF PIGLETS

Wpływ podawania preparatów żelazowych na zdrowotność
oraz niektóre wskaźniki hematologiczne i immunologiczne prosiąt

The intensive growth of piglets in their first days of life and the low reserves of this element lead readily to the iron deficiency. The objective of the study was

to determine the efficiency of the chosen preparations in anemia prevention, their influence on the breeding indices and behavior of some cell-mediated non-specific immunity indices in piglets from birth till the weaning time. The preparations employed (Biofer, Suifferin, Ferran) showed high efficiency in the iron deficiency supplementation in piglets. Both, erythrocyte count, hemoglobin concentration and hematocrit value proved to be markedly higher in the groups where the ferric preparations were supplied. In the treatment groups the iron administration stimulated the non-specific immunity system in the piglets. There was recorded a higher ability of PMN cells to reduce NBT in the rest and stimulated variants, a higher percentage of the phagocytizing cells and of the phagocytar index. Owing to the decreased immunity and anemia in the piglet group with no iron supplement, considerably lower body weight gains were noted and higher mortality until the weaning time.

Publication: Medycyna Wet. (Lublin), 61, 1400–1404, 2005. fig. 4, tab. 3, In Polish, summary in English

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Publication: Scientific Messenger of Lviv National Academy of Veterinary Medicine 7, 3, 182–191 2005, in Polish.

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Ref. VI Middle-European Buiatrics Congress, Kraków 1–4 VI 2005.

Publication: Proceedings of Achievements and Prospects of Ruminants Medicine, the VI Middle-European Buiatrics Congress, (suppl.) 24, 2005, in English.

DEPARTMENT AND CLINIC OF ANIMAL SURGERY

30 Głęboka, Lublin

Head: Prof. Dr. habil. Piotr Silmanowicz

RESEARCH STUDIES (SUMMARIES)

Adam Brodzki, Marcin R. Tatar, Kazimierz Pasternak, Dorota Róžańska,
Tomasz Szponder

FREE AMINO ACIDS IN SKIN NEOPLASTIC TISSUES AND SERUM IN DOGS

Considering almost identical environmental conditions and food of similar origin in humans and pets, the animals should be attractive for monitoring of the neoplasms' epidemiology, not only for the purposes of veterinary oncology but for human medicine as well. The aim of the study was to evaluate changes in amino acids (AA) profile determining free AA concentration of serum and skin neoplastic tissues in dogs. The investigation was performed on 17 dogs with malignant tumors, 9 with benign neoplastic processes and 17 animals that were free from neoplastic processes and served as a control group. The AA analysis, both in tissues and serum was performed by ion-exchangeable chromatography using automatic amino acids analyser. The obtained results showed that malignant tumors disturb amino acids metabolism and homeostasis in the affected animals, both in the serum and neoplastic tissues, while the benign neoplastic process has not shown negative influence on AA profile.

Publication: Bull. Vet. Inst. Pulawy 49, 231–235, 2005, tab. 4. In English, summary in English.

Izabela Polkowska, Piotr Silmanowicz, Maciej Orzelski

**THE EVALUATION OF THE CONSERVATIVE PERIODONTAL THERAPY IN DOGS
WITH THE COOPERATION OF THE OWNER**

Ocena leczenia zachowawczego paradontopatii psów we współpracy z właścicielem

The purpose of the study was the evaluation of the conservative periodontal therapy carried out with the cooperation of the owner. The study was conducted on 28 dogs at the age of 6–12 years. Patients were divided into 3 groups with the different stages of the periodontal changes. The effectiveness of the treatment was examined using the calibrated supragingival scaler. The excellent results were in 35.7% cases, good in 25% and unsatisfactory in 39.3% cases. The best therapeutical results were achieved when the treatment was performed with the full cooperation with the owner.

*Publication: Medycyna Wet. (Lublin) 61, 1408–1409, 2005, fig 5. tab. 1.
In Polish, summary in English.*

Aleksandra Sobczyńska-Rak, Piotr Silmanowicz, Jacek Piórkowski,
Izabela Polkowska, Piotr Dębiak

SELECTED ORAL CAVITY TUMORS OF DOGS

Wybrane nowotwory złośliwe jamy ustnej psa

Tumours of the alimentary tract represent 5% of all cancers in dogs. While conducting tests 9 dogs with malignant cancer were diagnosed. Among those, 44.4% were fibrosarcoma, 33.3% squamous epithelial carcinoma and 22.3% melanoma. Lesions were located mainly on the gums, soft palate, tongue, buccal mucous membranes as walls in the sublingual areas. The initial diagnosis included thorough clinical evaluation of how far the development of the tumor had advanced, the state of the lymph nodes, and histopathological tests were conducted as well. Radiological tests were conducted on the splanchnocranium bones evaluating the range of the cancer in the maxilla and mandible bones and X-rays of the chest were conducted to eliminate metastases. The most invasive tumor was melanoma. It often infiltrated the mucosal membranes of the oral cavity and metastasized to splanchnocranium bones and the cervical lymph nodes. After eliminating the presence of metastases, in the recorded cases of

fibrosarcoma and squamous epithelial carcinoma the preferred treatment was radical removal of the cancer with surrounding tissue. In the cases where no metastases to the lymph nodes are found and the cancer has attacked the bones it is possible to perform a partial maxilectomy or mandibulectomy. When metastases have occurred in both bones and lymph nodes the prognosis is very poor. The chances of cure decrease and the remaining options are palliative therapy or euthanasia of the animal.

Publication: Medycyna Wet. (Lublin) 61, 66–69, 2005, fig. 3. tab. 1, In Polish, summary in English.

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Ref. II Ophthalmological Congress: Ophthalmology – Ocular Emergencis. Lublin, 23 IV 2005 r.

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Publication: Proceedings of the XIII Congress of Polish Small Veterinary Association, 55–57, 2002, In Polish.

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**LABORATORY
OF VETERINARY RADIOLOGY
AND ULTRASONOGRAPHY**

30 Głęboka, Lublin

Head: Dr Renata Komsta

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Publication: Magazyn Wet, 9, 6–8, 2005. In Polish.

DEPARTMENT OF FOOD HYGIENE OF ANIMAL ORIGIN

12 Akademicka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Renata Pyz-Lukasik

BACTERIAL CONTAMINATION AND SENSORY CHARACTERISTICS OF RABBIT TISSUES IN RELATION TO THE PLACE OF SLAUGHTER AND TIME OF STORAGE

Zanieczyszczenie mikroflorą oraz cechy sensoryczne tkanek królików
w zależności od miejsca uboju i czasu przechowywania

The aim of the study was to evaluate the effect of a place and time of storage on the microbiological quality, ammonia level, appearance and odor of the meat and internal organs of rabbits. The samples were obtained from three slaughter places: an export slaughterhouse (R), a slaughterhouse without export certification (K), as well as home slaughter (T). The analyses were performed after 24, 72 and 144 hours of storage. Total count of bacteria, the psychrophilic bacteria count, ammonia level, appearance and odor were chosen as the determinant of spoilage rate. The hygienic condition of the meat, liver and kidneys obtained after the slaughter was dependent on the sanitary status of the slaughter places. The lowest bacterial contamination and the most desirable sensory characteristics were attained by the export slaughterhouse. It seems to be interesting that both the meat and internal organs obtained from home slaughter were characterized by high hygienic conditions. The investigated raw materials were different

in relation to the microbiological contamination level that determines the duration of storage and depends on a kind of tissue.

Publication: Medycyna Wet. (Lublin) 61, 1162–1164, 2005, fig. 4. In Polish, summary in English.

Renata Pyz-Łukasik, Krzysztof Szkucik

**BACTERIAL CONTAMINATION OF RABBIT CARCASSES AND GIBLETS
IN RELATION TO A PLACE OF SLAUGHTER**

Zanieczyszczenie bakteryjne tuszek i narządów wewnętrznych królików
w zależności od miejsca uboju

The aim of the investigations was to describe the general bacterial contamination, psychrophilic microbe count, coli group count fecal streptococci as well as presence of pathogenic germs (*Salmonella bacilli* and coagulazo positive staphalococcus) in muscle tissue and giblets of rabbit carcasses in relation to a place of slaughter. Material for investigation consisted of rabbit muscle tissue and giblets from three places of slaughter: a slaughterhouse qualified to export meat, a slaughterhouse without export qualifications, as well as from a farmer's slaughter. The microbiological denotation was conducted according to the Polish Standards in accordance with ISO norms.

The general number of oxygenic bacteria in 1 g of muscle tissue was 10^4 – 10^5 , while in giblets 10^2 – 10^4 . The results of the investigations indicated a diverse level of bacterial contamination of the investigated tissue depending on the place of slaughter. The highest level of contamination and the presence of Coagulazo positive staphalococcus bacilli were confirmed in carcasses and giblets from the slaughterhouse without export qualifications. No differences in contamination between the samples from the export slaughterhouse and farmers' market were indicated. In none of the examined muscle tissue and giblets samples *Salmonella bacilli* were detected.

Publication: Medycyna Wet. (Lublin) 61, 567–570, 2005, fig. 4. In Polish, summary in English.

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Publication: Medycyna Wet. (Lublin) 61, 471–476, 2005. In Polish.

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Publication: Medycyna Wet. (Lublin) 61, 356–357, 2005. In Polish.

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Publication: Medycyna Wet. (Lublin) 61, 485–487, 2005. In Polish.

PROST E. K.: Future of veterinary medicine in EU. (Przyszłość medycyny weterynaryjnej w Unii Europejskiej).

Publication: Medycyna Wet. (Lublin) 61, 1074–1075, 2005. In Polish.

DEPARTMENT OF PATHOLOGICAL ANATOMY

30 Głęboka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Zbigniew Nozdryn-Plotnicki, Piotr Listos, Wojciech Łopuszyński, Piotr Dębiak

SECTION INVESTIGATION OF ANIMALS WOUNDED FROM FIRE ARMS: SOME REMARKS

Badanie sekcyjne zwierząt postrzelonych z broni palnej – obserwacje własne

Veterinarian is a person who on account of his or her specialized knowledge, can be asked through the legal organs to give an opinion which is based on that knowledge. This article describes cases of animals wounded by fire arms and recounts the procedure of investigations on the recommendation of the legal organs and private persons. The analysis of our cases shows that 8 out of 9 animals in question were wounded by fire arms. In each case when we suspect a wound from fire arms, it is necessary to make an RTG investigation before the section investigation. Close co-operation with a criminological laboratory is also mandatory. Conduct with animal corpses before and after the section investigation is of paramount importance for a reliable and professional opinion. The subject described in this article belongs to one of the most difficult in veterinary-law practice.

Publication: Medycyna Wet. (Lublin) 61, 887–889, 2005, fig. 4. In Polish, summary in English.

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Publication: Proceedings of the III Oncological Conference of Polish Small Animal Veterinary Association, 1–4, 2005. In Polish.

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Ref. III Sustaining Animal Health and Food Safety in Organic Farming Workshop, Falenty, 16–18 XI 2004.

Publication: Proceedings of the III Sustaining Animal Health and Food Safety in Organic Farming Workshop, The University of Reading, 25–29, 2005. In English.

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Publication: Magazyn Wet. on line (Business and law), 2005. In Polish.

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Publication: Magazyn Wet. on line (Business and law), 2005. In Polish.

ŁOPUSZYŃSKI W., KOMSTA R., BRODZKI A., ORZELSKI M.: Malignant nail bed neoplasia of the dogs (Nowotwory złośliwe łożyska pazura u psów).

Publication: Magazyn Wet. 14, (3), 4–6, 2005, fig. 5. In Polish.

DEPARTMENT OF PRECLINICAL VETERINARY SCIENCE

12 Akademicka, Lublin

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

SUB-DEPARTMENT OF PATHOPHYSIOLOGY

12 Akademicka, Lublin

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

RESEARCH STUDIES (SUMMARIES)

Ryszard Bobowiec, Elżbieta Tusińska, Krzysztof Szkucik, Franco Martelli,
Urszula Kosior-Korzecka

RESPONSE OF RATS WITH ALLOXAN-INDUCED DIABETES ON DIET SUPPLEMENTED WITH BUCKWHEAT

To investigate the improvement of the course of alloxan-induced diabetes in rats by Buckwheat (BW) we prepared a diet enriched with BW and fed the diabetic rats for 5 weeks. To evaluate the effects of BW the following parameters have been appreciated: body weight gain, concentration of glycated hemoglobin (gHb), the level of malondialdehyde (MDA) in the plasma and glucose tolerance test (GTT). Both values of body weight gain and GTT were successively ameliorated together with progressive supplementation of diet with BW in diabetic rats. In contrast, concentration of gHb and MDA levels were found to be significantly

increased in diabetic rats fed the diet supplemented with BW. Taking into consideration all these experimental findings, we have established that the beneficial effects of BW is not uniform and apart from some gain in body weight and improvement in GTT the BW exerts unfavorable effects on gHB and the level of MDA. Such equivocal response of our diabetic rats to the diet supplemented with BW may be the result of low level of antioxidants (rutin, quercetin) and trace elements such as manganese in our BW seeds, which, if present, exert beneficial effects on the course of diabetes.

Publication: Annales UMCS (Lublin), sectio DD, 60, 116–123, 2005, fig. 4. In English, summaries in English and Polish.

Urszula Kosior-Korzecka, Anna Swadźba, Ryszard Bobowiec,
Joanna Wessely-Szponder

PMSG INFLUENCE ON OESTROGEN SECRETION BY PORCINE GRANULOSA CELLS FROM OVARIAN FOLLICLES AND CYSTS *in vitro*

The aim of the study was the comparison of the oestrogen secretion from the granulosa cells isolated from porcine ovarian follicles and follicular cysts in the control conditions and under the influence of PMSG (pregnant mare serum gonadotropin). The ovaries were isolated from the 5–6 years old sows, weighing on average 283.5 ± 21.7 kg, in the slaughterhouse. The granulosa cells were isolated from 6–7 mm in diameter ovarian follicles and 9–10 mm in diameter follicular cysts, and after that cultured in DMEM/F 12 (1:1) medium without gonadotropins or with 0.1, 1, 10 and 100 IU/l of PMSG, respectively. After 24 h of culture the media were collected to analyse the concentration of oestrogens (17 β -oestradiol – E-2, oestrone – E-1) by high-pressure liquid chromatography (HPLC, Beckman 125 SM) method with UV detection. In the control conditions, significantly ($P \leq 0.05$) lower secretion of steroid hormones from the cystic cells was found (E-2: 2.44 ± 0.45 pg, E-1: 2.46 ± 0.23 pg/ 5×10^5 cells/24 h) in comparison to the cells from follicles (E-2: 9.8 ± 0.93 pg, E-1: 9.24 ± 1.15 pg/ 5×10^5 cells/24 h). The introduction of PMSG to the culture medium, both in the case of granulosa cells from follicles and cysts resulted in significant ($P \leq 0.05$) increase in oestrogen secretion. This augmentation was in positive correlation with PMSG doses. After the 24 h period of follicle – derived granulosa cells culture with the highest dose of PMSG (100 IU) 3.9 – fold increase in the quantity of secreted E-2 and 3.8 – fold increase of E-1 in comparison to control was found. At the same conditions the secretion of E-2 and E-1 from cyst cells was 8.9 and 6.7 – fold higher than in control. Apart from the lower quantity of steroid hor-

mones secreted from the granulosa cells isolated from cysts in control conditions, their response to PMSG was significantly higher in comparison to the cells isolated from ovarian follicles.

Publication: Annales UMCS (Lublin), sectio DD, 60, 124–131, 2005, fig. 5. In English, summaries in English and Polish.

Joanna Wessely-Szponder, Renata Urban-Chmiel, Andrzej Wernicki,
Ryszard Bobowiec

**EFFECT OF LEUKOTOXIN OF *Mannheimia haemolytica* AND LPS
OF *E. coli* ON SECRETORY RESPONSE OF BOVINE NEUTROPHILS *in vitro***

To evaluate the role of leukotoxin (LKT) of *Mannheimia haemolytica* and lipopolysaccharide (LPS) of *E. coli* 055:B5 in pathogenesis of bovine respiratory disease (BRD) we investigated their *in vitro* effects on cultured bovine neutrophils. Functional parameters of neutrophils including degranulation, generation of superoxide, and nitric oxide were distorted in response to both toxins. The most essential reaction of neutrophils was found in respect to release of elastase after addition of LKT as well as LPS at concentration of 300 µg/ml. Moreover, we observed an increased release of myeloperoxidase (MPO) and alkaline phosphatase (ALK-P) from polymorphonuclear cells (PMN) after addition of LKT and LPS. We also found enhanced superoxide generation by bovine neutrophils after exposure to different concentrations of LKT and LPS. In cultures of PMN treated with LKT, concentration of nitrite increased with growing concentrations of LKT. Lower values of nitrite were obtained in cultures exposed to LPS. Partial lysis of PMN, determined by LDH (lactate dehydrogenase) leakage, started at concentration of 300 µg/ml for both toxins, meanwhile LKT concentration above 300 µg/ml was lethal. Our study has revealed that neutrophils in response to both toxins enhanced the release of the analysed substances, which participate in worsening the course of the disease and play a role in lung injury during BRD. Toxins introduced to the cultural medium stimulate the release of the studied constituents from neutrophils by combined activation and lysis of neutrophils.

Publication: Pol. J. Vet. Sci., 8, 99–105, 2005, fig. 6. In English, summary in English.

Marta Wójcik, Ryszard Bobowiec, Michał Klimont, Elżbieta Tusińska

**EFFECT OF 17 β -ESTRADIOL ON GLUCOSE TOLERANCE
AND PLASMA INSULIN CONCENTRATION IN ANESTRAL SHEEP**

Natural estrogens especially 17 β -estradiol have been implicated as etiologic factors in development of disturbances of insulin releasing and glucose metabolism. Experiments were carried out on 6 Polish Lowland sheep, weighing 40-42 kg, 1.5 years of age each. The animals were divided into two groups: I – control group; II – intramuscularly treatment with 17 β -estradiol 5mg/kg b wt. At the sixth day from the beginning of estradiol treatment, in the both group of animals intravenous glucose tolerance test was carried out. After 5-days administration of estradiol, plasma concentration of this hormone was significantly ($p \leq 0.05$) higher in comparison to the control and reached maximum value 125.88 \pm 2.96 pg/ml. In the control group, the infusion of hypertonic solution of glucose increased the plasma glucose concentration from 3.16 \pm 0.15 mM/l to maximum 25.59 \pm 1.49 mM/l in 10 min and produced a marked rise in the concentration of plasma insulin from 229.76 pM/l to 1173.68 pM/l. In comparison to the control, infusion of glucose in estrogen-treatment group of sheep caused a substantial rise of glucose level to maximum 24.47 \pm 3.29 mM/l in 30 min. This considerable increase of glucose concentration was maintained during the next 90 minutes of experiments. The insulin response to i.v. glucose infusion in this group of animals, was reduced and did not exceed 641.62 \pm 6.44 pM/l.

Publication: Electronic J. Pol. Agricul. Univ. 8, 1-6, 2005, tab. 2. In English, summary in English.

Marta Wójcik, Ryszard Bobowiec, Piotr Silmanowicz

**CHANGES OF BILE SECRETION AND LIVER LIPID PEROXYDATION
UNDER INFLUENCE OF GLICOCORTYCOIDS SHEEP**

Experiments were performed on 9 sheep divided into three groups: I – control; II – treated i.m. for 5 days with hydrocortisone (20 mg/kg b wt); III – treated for 5 days with C plus vit.C (20 mg/kg b wt i.m.). Administration of hydrocortisone decreased bile flow to 6.65 \pm 1.35 μ l/min/kg b wt in 165 min. Addition of vit. C resulted in increase ($p < 0.05$) of bile output to mean value 12.059 \pm 0.937 μ l/min/kg b wt. Under stressful condition increase ($p < 0.05$) of biliary concentration and secretion of malondialdehyde (MDA) were observed (max. 0.952 \pm 0.123 μ M/min/kg b wt in 120 min). Thus, biliary level of this compound seems to be a useful marker of oxidative stress in liver. Exposure to vit. C

caused reduction of biliary output of MDA averaged $0.461 \pm 0.029 \mu\text{M}/\text{min}/\text{kg}$ b wt. Biliary cholesterol (CH) concentration in hydrocortisone-treatment sheep gradually increased to max. $191.75 \pm 8.31 \text{mg}/100\text{ml}$ in 105 min. After vit. C administration considerable ($p < 0.05$) reduction of biliary level of this compound was observed. On the other hand, elevation of biliary output of CH to highest value $18.965 \mu\text{M}/\text{min}/\text{kg}$ b wt in 135 min of experiment was found. In conclusion, administration of ascorbic acids ameliorates glucocorticoids induced lipid peroxidation and cholesterol crystal formation in liver.

Publication: Annales UMCS (Lublin), sectio DD, 60, 132–140, 2005, fig. 4, tab. 1. In English, summaries in English and Polish.

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Publication: Medycyna Wet. (Lublin) 61, (suppl.) 32, 2005. In English.

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Publication: Medycyna Wet. (Lublin) 61, (suppl.) 32, 2005. In English.

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Publication: Biological and cultural aspects of sheep husbandry. (Biologiczne i kulturowe aspekty gospodarki owczarskiej). Kraków 2005, pp. 27. In Polish.

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Publication: Życie Wet. 80, 274–278, 2005, fig. 3. In Polish, summary in English.

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RESEARCH STUDIES (SUMMARIES)

Bożena Modzelewska-Banachiewicz, Cezary Kowalski, Grażyna Ziółkowska,
Jacek Banachiewicz

BIOLOGICAL ACTIVITY OF 1,2,4-TRIAZINE AND 1,2,4-TRIAZOLE DERIVATIVES

Aktywność biologiczna pochodnych 1,2,4-triazin i 1,2,4-triazoli

Triazine and triazole are used in medicine, agriculture and industry and they are also applied as effective herbicides and fungicides. In continuation of our studies on condensed heterocycles 1,2,4-triazine and 1,2,4-triazole derivatives were prepared. These newly synthesized compounds were screened for their antibacterial and antifungal activity and the results are discussed in this paper.

Publication: Annales UMCS (Lublin), sectio DD 60, 11–15, 2005. tab. 2, fig. 1. In Polish, summary in English.

Cezary Kowalski, Zbigniew Roliński, Małgorzata Pomorska, Rafał Zań,
Dorota Krasucka

COMPARISON OF PHARMACOKINETICS OF OXYTETRACYCLINE ADMINISTERED AS POWDER AND GRANULATE IN PIGS

Porównanie farmakokinetyki oksytetracykliny stosowanej w postaci proszku i granulatu u świń

Oxytetracycline (OTC) is an antibiotic with a broad-spectrum of antimicrobial activity. It is particularly active against Gram-positive and Gram-negative bacteria, as well as these of *Rickettsia*, *Coxiella*, *Chlamydia*, *Mycoplasma* and some species from *Mycobacterium* genus. OTC is widely used in

the treatment of respiratory, urinary and alimentary tract infections in various animal species, especially pigs, because of its activity and good penetration into the tissues. In this study the bioequivalence and differences in pharmacokinetics of granulated and powdered OTC specimens were established. The following parameters recommended by EMEA were determined: C_{max} , T_{max} , $AUC_{0 \rightarrow t}$, $t_{1/2}$, and MRT. All the investigations were carried out in populations of 16 weaners. The concentration of OTC in serum was determined by means of the appropriately modified HPLC method. The maximal average concentration (C_{max}) of OTC in plasma was found to occur at 2.9 h (for powder) and 3.1 h (for granulate) after oral administration. They were 474.9 ng/ml and 455 ng/ml respectively. The therapeutic level of oxytetracycline during the investigation remained above MIC_{50} . MRT and $t_{1/2}$ were the same as in literature.

Publication: Medycyna Wet. (Lublin) 61, 188–190, 2005. fig. 1, tab. 2. In Polish, summary in English.

Cezary Kowalski, Zbigniew Roliński, Tomasz Sławik, Bronisław K. Głód

DETERMINATION OF NORFLOXACIN IN CHICKEN TISSUES BY HPLC WITH FLUORESCENCE DETECTION.

An HPLC method for the determination of norfloxacin in tissues (muscle, liver and fat) of chickens is described. The supernatant from a centrifuged homogenate was analyzed using an RP-18 column with RP-18 precolumn. Fluorescence at an excitation wavelength of 278 nm and an emission wavelength of 456 nm was used for detection. The mobile phase was water/methanol (65:35, v/v adjusted to pH 3 with H_3PO_4), which contained tetrabutylammonium hydrogen sulphate as ion-pairing agent. The flow rate was 1 ml/min. The detection limit of norfloxacin in the tissues was 2.5 ng/ml of homogenate.

Publication: J. Liq. Chromatogr. Related Technol., 28, 121–135, 2005. fig. 9, tab. 4, In English, summary in English.

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Publication: Book of Abstracts XXIXth Symposium Chromatographic Methods of Investigating the Organic Compounds, 71, 2005. In English.

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Publication: Medycyna Wet. (Lublin) 61, (suppl.) 41, 2005. In English.

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Publication: Materials of the Working Conference: Save the antibiotics, 56, 2005. In Polish.

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Publication: Materials of the VIIIth Kurpiowskiej Science Conference of Veterinary Medicine, 37, 2005. In Polish.

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Publication: Państwowe Wydawnictwo LIBER, Lublin, 265–269, 2005. In Polish.

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Publication: Państwowe Wydawnictwo LIBER, Lublin, 275–281, 2005. In Polish.

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Publication: Państwowe Wydawnictwo LIBER, Lublin, 633–640, 2005. In Polish.

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RESEARCH STUDIES (SUMMARIES)

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ECOLOGICAL ATTITUDE OF EXTRAMURAL STUDENTS IN RELATION TO INTRAMURAL STUDENTS OF DIFFERENT FACULTIES FROM POLAND AND SWEDEN

Postawy ekologiczne studentów zaocznych w porównaniu ze studiami dziennymi
różnych kierunków w Polsce i Szwecji

Contemporary environmental problems need building up new competence based on knowledge, which allows for evaluation of risk for ecosystems and enables to act according to sustainable development rules. The study was focused on ecological attitude; an assessment of knowledge and evaluation of global and local environmental questions as well as readiness to proecological acting. The 23 points questionnaire was carried out among extramural tuition-paying students of pedagogy; 259 postgraduate and 63 undergraduate ones. Most of them were female and many of them were teachers. The questionnaire was constructed within Polish-Swedish Ecological Group and applied in previous studies of intramural students in the two countries. Already published results of those students of veterinary medicine, agriculture, psychology, economy, and engineering provided the background for investigating extramural students. Ecological knowledge of extramural students was estimated as moderate, whereas its level was high among intramural students. Assessment of environmental problems and their impact on functioning in one's surroundings reveals a high level of awareness of hazards for the quality of life. However, personal performance in order to prevent them is considered to be rather limited. Readiness to join ecological organizations, shopping preferences and reduction of the standard of life among extramural students were comparable with intramural

students from Poland, but significantly lower, with some exceptions, compared to the Swedish ones.

Publication: Pol. J. Environ. Stud. (HARD) 13, 47–54, 2004, fig. 18. In English, summary in English.

Agnieszka Muzyczuk-Piekarska, Halina Kowalska-Pyłka, Wojciech Cybulski,
Wojciech Rzeski

EVALUATION OF CYTOTOXIC EFFECT OF FUNGICIDES OF BENZTHIOANILIDE STRUCTURE

Ocena cytotoksycznego działania fungicydów o budowie benztioanilidów

Acute cytotoxic effect of fungicidal preparations derived from benzthioanilides moiety compound was estimated by NRU-, KB- and test MTT-tests run in model experiments within rat hepatocyte cultures. The results of the study indicate the lowest activity of one chloride ortho – substituted 2,4-dihydroxy-2-chlorobenzthioanilide in the aniline ring. The next in toxicity order was situated 2,4-dihydroxy-2,5-dichlorobenzthioanilide (two chloride substituted compound) and 2,4-dihydroxy-2-carboxymethylbenzthioanilide followed by 2,4-dihydroxybenzthioanilide (without substituted groups). The most toxic appeared 2,4-dihydroxy-2,4,5-trichlorobenzthioanilide with three chloride substitutions in the aniline ring. In addition a correlation of the results from *in vitro* carried out experiments with the LD₅₀ data from literature for the same derivatives of 2,4-dihydroxybenzthioanilide was confirmed.

Publication: Medycyna Wet. (Lublin) 60, 1124–1128, 2004, fig. 3, tab. 4. In Polish, summary in English.

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Publication: *Medycyna Wet. (Lublin)* 61, (suppl.) 30, 2005.

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Publication: *Magazyn Wet.* 14(2) 59–62, fig. 4, tab. 2, 2005. In Polish.

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