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ABSTRACTS

BIOLOGY

- TI: CYTOGENETIC ANALYSIS OF POLYMORPHISM IN SELECTED SPECIES OF THE GENERA *BOS*, *BISON* AND *ORYX*
- AU: Ciechański J., Kruszyński W.
- AD: Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Science
- LA: Polish
- AB: Metaphase chromosomes derived from leukocyte cultures were observed in a Javanese banteng, Domestic yak, European bison, Zebu and Scimitar-horned oryx. Chromosomes were analyzed using the program Optica-Vision Pro5. Within the types of *Bos* and *Bison*, studies showed no significant differences in the number, morphology and structure of chromosomes. However the research showed significant differences in both numbers and morphology were found between these types and the type of *Oryx* (as an example a Scimitar-horned oryx was taken).
- DE: karyotype, Bos, Bison, Oryx
- SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 15–23.
- TI: ANTHROPOLOGICAL CHARACTERISTICS BONE REMAINS FROM CEMETERY NEAR THE CHURCH OF ST. MARY MAGDALENE IN WROCLAW (XVI–XVIII W.)
- AU: Kwiatkowska B., Nowakowski D.
- AD: Department of Anthropology, Wrocław University of Environmental and Life Science
- LA: Polish
- AB: Anthropological studies of bone remains of the inhabitants of Wrocław add to the knowledge about its former ethnical structure as well as living and sanitary conditions in the past. 142 skeletons belonging to the individuals of both sexes were studied and of different age were studied. The skeletons were excavated in 2005 and 2007 in the cemetery near St. Mary Magdalene's church and were dated to 16th – 17th century. Morphological analysis was performed together with the study on physiological stress symptoms. The studies confirmed that the individuals buried there belonged to the social elite of the city and allowed for setting the relations with other skeletal populations from Wrocław.
- DE: skeletal remains, the Middle Ages, Wrocław
- SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 25–43.
- TI: ATTEMPT TO AMPLIFY SEQUENCE OF STEROID 21-HYDROXYLASE IN SEVERAL BIRD SPECIES USING DEGENERATE PRIMERS FLANKING THE CYP21 GENE OF MAMMALS
- AU: Grabowski K., Strzała T., Kosowska B.
- AD: Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Science

- LA: Polish
- AB: In this paper attempt to amplify and sequencing of the CYP21 gene in several species of birds. Degenerate primers were used, designed based on known sequences of mammals. In the pilot study, in PCR, mammalian DNA was used. Result of the test was positive. Further studies focused on the DNA of birds. PCR reactions were carried out. Selected products were purified and sequenced. Sequences were obtained from pheasant (*Phasianus colchicus*), guinea fowl (*Numida meleagris*), turkey (*Meleagris gallopavo*), pigeon (*Columba livia*) and chicken (*Gallus gallus*), but they did not show the expected homology with known sequences of CYP21 gene.
- DE: 21-hydroxylase gene, degenerate primers, PCR, sequencing
- SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 45–.
- TI: ARTHROPODS (*ACARI*, *ANOPLURA*, *SIPHONAPTERA*) OF SMALL MAMMALS FROM THE KUJAWSKO–POMORSKIE PROVINCE
- AU: Haitlinger R.
- AD: Institute of Biology, Department of Systematics and Ecology of Invertebrates, Wrocław University of Environmental and Life Sciences
- LA: English
- AB: 1176 arthropods belonging to ~ 80 species were obtained from 433 small mammals belonging to 17 species: 925 *Acari* at least of 56 species, 122 *Anoplura* of 7 species and 129 *Siphonaptera* of 17 species. 39 species are recorded for the first time from Kujawsko-Pomorskie province. Most species of arthropods (45) were collected from *Myodes glareolus* and *Apodemus agrarius* (37). The most numerous arthropods were *Ixodes ricinus*, *Laelaps agilis*, *Neotrombicula vulgaris* and *Hirsutiella zachvatkini*.
- DE: *Acari*, *Anoplura*, *Siphonaptera*, mammals, Kujawsko-Pomorskie province, faunistic
- SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII: 583: 59–78.

ANIMAL BREEDING

- TI: LONG-TERM EXERCISE AND ITS EFFECT ON SELECTED HAEMATOLOGICAL INDICES OF BLOOD IN JUMPING HORSES
- AU: Bis-Wencel H.
- AD: Department of Animal and Environment Hygiene, University of Life Science in Lublin
- LA: English
- AB: The purpose of this study was to determine the effect of long-term exercise of varying intensity on the haematological indices of jumping horses. The study was conducted on 24 clinically healthy horses.
- Blood for designations collected twice: at the beginning of March, when the indoor season was nearing to an end (smaller number of starts), and at the end of May, when an effort was particularly intensified due to the continuous training and the start of the open season (more starts).
- The whole blood was examined for: the total number of leukocytes (WBC), percentage of lymphocytes, monocytes and granulocytes, the neutrophils/lymphocytes ratio (N/L), the number of platelets (PLT), mean platelet volume (MPV) and platelet distribution curve width (PDW). The study was performed using a hematology analyzer MS9.
- Mean values were compared between the retrievals (stallions and mares), and in I and II collection animals of both sexes were compared among themselves.
- The study showed that the growing physical effort of jumping horses caused increased rates of haematological indices, such as WBC, Mon, Gran, and PLT in collection II compared to

I. Statistical analysis showed the significance of differences at $P \leq 0.05$ in parameters: WBC, Lim, Games, MPV and Lim at $P \leq 0.01$.

DE: horse, hematological indices, effort

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII: 583: 79–87.

TI: EFFECT OF MONTH AND AGE OF WORKER BEES *APIS MELLIFERA CARNICA* ON MIDGUT FILL WITH POLLEN GRAINS

AU: Howis M.¹, Chorbiński P.², Janiszewska K.¹, Nowakowski P.¹

AD: ¹ Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

² Department of Epizootiology and Clinic of Animal Exotic Birds, Wrocław University of Environmental and Life Science

LA: Polish

AB: The aim of research was to evaluate presence of pollen grains in the midgut of *Apis mellifera carnica* in late summer/autumn period (August, September, October) in worker bees aged 2, 7 and 13 days, when bee colonies (n = 12) have been prepared for wintering. Midgut content of pollen grains of histological preparations of midgut of at least 10 bees per colony in each age group (2, 7 and 13 days old) were analyzed as present (+) or absent (-). Data from 2009 season showed that in 2 days old worker bees pollen grains midgut fill reached the highest percentage (64,4%) in the second half of August and the lowest in the second half of October (19,6%). Share of midgut fill with pollen grains in 7-th and 13-th days of life had the same seasonal pattern as in 2 day old ones with sharp decline between August and September. Generally bees did not differ in pollen midgut fill due to their age from 2 to 13 days. Results showed that bees had three fold ($P < 0.05$) lower share of midgut fill with pollen grains in September and October when compared to August data.

DE: *Apis mellifera*, worker bee, age, midgut, pollen grains

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 89–93.

TI: DYNAMICS OF BONES DEVELOPMENT IN EARLY GROWTH OF CHICKENS FED DIETS WITH DIFFERENT AMOUNTS OF CALCIUM AND PHOSPHORUS

AU: Jamroz D.¹, Wertelecki T.J.¹, Kuryszko J.², Żyłka R.³, Kaleta-Kuratewicz K.²

AD: ¹ Department of Animal Nutrition and Feed Quality, Wrocław University of Environmental and Life Sciences

² Department of Histology and Embryology, Wrocław University of Environmental and Life Sciences

³ Department of Physics and Biophysics, Wrocław University of Environmental and Life Sciences

LA: English

AB: Broiler chickens within 1–28 days post hatch were fed diets containing different amounts of Ca (11 or 9 g/kg) and P-available. (4.5–3.7 g/kg). The dynamics of bone growth, bone metric and mechanical parameters, chemical composition and histological picture were determined. The body weight noted on day 28 post hatch in treatments II (9 g Ca and 3.7 g P-avail./kg) and III (11 g Ca and 3.7 g P-avail./kg) was significantly lower than in treatment I (11 g Ca and 4.5 g P-avail./kg) and IV (9 g Ca; 4.5 g P-avail.). The bone strength evaluated on day 7 and 28 post hatch and elasticity parameters measured on day 28 were significantly lower in chickens of treatment IV. The best chemical composition of whole tibia and its parts was stated only on day 28 in birds from treatment I. In younger ones, the significantly higher bone ash content was found in the same treatment. Analysis of mineral composition of tibia parts in relation to the level of Ca and P-available in diets and lack of significant differences show that it is not depending on the level of these macroelements in feed mixtures. It must be noted that the contents of Ca and P-available as 11 and 4.5 or 11 and

3.7 g/kg diet, was the most beneficial nutritional variant for bone quality and ash content in bone, however without marked changes in Ca and P content in it. Moreover, it should be stated that only one of the applied nutritional variants 9 g Ca and 4.5 g P-available in feed mixture (treatment IV) significantly or insignificantly decreased the bone quality parameters.

Response of chicken in early growth phase to the diversified Ca and P level in feed mixtures, determined on the basis of mechanical and metric properties, chemical composition and histological picture of long bone – tibia, indicates the substantial adaptative abilities and ambiguous trends in dynamics of analyzed parameters. Greater, but unclear differences in bone quality parameters among treatments, just from 28 day of chickens life became significant.

DE: broilers, bones, chemical composition, histological structure

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 95–121.

TI: ASSESSMENT OF THE HORSES' BEHAVIOUR FOR RACING PERFORMANCE ON THE WROCLAW – PARTYNICE RACECOURSE IN THE 2006–2009 SEASONS

AU: Kamińska K., Geringer de Oedenberg H.

AD: Department of Horse Breeding and Riding, Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The study included 541 horses tested for racing performance on the Wrocław Partynice Racecourse in the 2006–2009 seasons.

The purpose of the study was to evaluate half-bred and Arabian horses' behaviour before race. Influence of season, sex, breed, sire, breeder, trainer and number of starts were estimated.

Significant differences in the mean marks of behaviour for horses from different breeder were found. Horses which came from private studs showed high level of nervous balance. It can be associated with different conditions of maintenance, rearing. Behaviour of the horses depended also on sex. It has been proved that stallions are more stress-resistant than mares. Arabian horses received maximum marks from all observed breed. Lower trend of mean marks of horses' behaviour were observed with an increase in the individual success coefficient. Marks for mounting horses by jockey and coming into a starting machine were highly significant for horses which took unpaid place. More frequent participation in races did not prove that horses easily adapt to stressful conditions.

Heritability coefficients for behaviours before race were from 0.26 to 0.70.

DE: behaviour, racehorses

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 123–136.

TI: VALUES OF HORSES' RACING PERFORMANCE MEASURES DEPENDENT OF DIFFERENT FACTORS

AU: Kamińska K., Geringer de Oedenberg H.

AD: Department of Horse Breeding and Riding, Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The study included 541 horses tested for racing performance on the Wrocław – Partynice Racecourse in the 2006–2009 seasons.

Significant differences in the mean marks of racing performance measures from different breeder were found. Racing performance measures depended also on sex. Higher values received stallions which came from state studs. Significant differences ($p \leq 0.01$) in the mean marks of individual success coefficient, exploitation' coefficient, ranking of horse in race

and success'coefficient between horses which started less than 3 times and horses started more than 6 times were found.

DE: racing performance measures, individual success coefficient, ranking of horse in race, exploitation' coefficient, success' coefficient

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 137–145.

INTENSITY OF ENDOPARASITES INFECTION IN CHOSEN GROUPS OF PIGS IN SMALL-COMMERCIAL HOUSEHOLD

AU: Knecht D., Jankowska J., Chmielewska K., Mąkosza H.

AD: Department of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The aim of the study was to determine the species composition and the level of infection with endo-parasites in pigs from six technological groups in small-commercial household. The research was conducted based on the 120 samples of chosen technological groups (LK – suckling sow, PM – younger piglets, PS – elder piglets, W – piglets; TM – younger fattener; TS – elder fattener). To estimate the level of infection with endo-parasites the given indicators were used: prevalence of infection, intensity of infection and the number of parasite's eggs in one sample. The research focus was also on establishment of total percentage of lean meat in pig carcass of the fatteners in the EUROP classification.

DE: parasites in pigs, suckling sow, piglets, young of pigs, fattener, meat-ness

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 147–157.

TI: THE SOURCES OF INFORMATION FOR CONSUMERSON THE CONDITIONS IN WHICH FARM ANIMALS LIVE

AU: Kowaliszyn B., Sitkowska B., Mroczkowski S.

AD: Department of Genetics and General Animal Breeding, University of Agriculture and Life Sciences in Bydgoszcz

LA: Polish

AB: Easy access to information for everyone is one of the signs of our times. If consumers are not provided true information on how animals are kept, it may lead to differing attitudes and behaviour. The objective of our research was to establish from which sources of information consumers learn about the conditions in which farm animals are kept.

The research was conducted in November 2010, using the CAPI system, on 1000 respondents selected by stratified sampling, aged fifteen or more. The results were analysed in 2 sets: positive response (declared source of information) or negative response (no source of information) (N = 1000); and the frequency of each source in a group of positive replies (N = 821). Percentages of each answer in a group were calculated according to gender, type of degree, place of domicile, and age. The significance of differences between answer frequencies in each group was analyzed using the χ^2 test.

The most frequently declared source of knowledge on the life of farm animals in our research was television – 63.5% of all positive responses. Significant differences in the frequency of declaring TV as the source of knowledge were found between groups according to their education and age. The press was included in 12.3% of positive responses – significant differences in frequencies were noted among people with different education backgrounds. Less than 8% of positive responses was for education; own experience and the Internet were 5.5%; radio 4%; and friends or family 1.3%.

DE: consumers, animal welfare, sources of knowledge, survey

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 159–168.

TI: THE ANALYSIS OF MARE OVARIES ACTIVITY DEPENDING ON MONTH OF REPRODUCTIVE SEASON, BREED AND AGE

AU: Kruszyński W., Maliszewska M., Wilk K.

AD: Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: English

AB: The study included 21 mares of Małopolski horse, and 18 mares of Polish warmblood horse aged from 3 to 18 years. The mares were used for breeding in years 1999–2004 in a stud situated in south-west part of Poland. In total, 222 reproduction seasons were analysed. The results of an assessment of the follicular stage of mare ovaries conducted by ultrasonographic method with use of the Echosond USG apparatus, and palpable method (*per rectum*) in a scale from F0 to F4 were used in the study. The obtained results concerning the frequency of particular phases on mares ovaries were divided according to: month of the reproductive season, age, family and age of mares. Significance of differences between the parameters analysed was verified using Chi2 test. Significant differentiation in ovaries activity in particular months of the reproductive season were noted. The highest activity measured by F3 and F4 phases frequency corresponded to the highest breeding effectiveness. No influence of genetic factors (breed and family) and the age on the level of ovaries activity was observed. Higher activity measured by F2, F3, F4 phases frequency was observed on the left ovary.

DE: horse, reproduction, ovaries activity

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 169–174

TI: THE INFLUENCE OF SYNTHETIC PYRETHROIDS TO FISH

AU: Ludwikowska A.

AD: Department of Ichthyobiology and Fisheries, Agricultural University of Kraków

LA: Polish

AB: The pyrethroids are the fourth and the youngest class of insecticides. They are synthetic analogues of natural pyrethrins – extracted from *Chrysanthemum* flowers. The pyrethroids are extremely toxic to aquatic organisms, included fish. Exposure to pyrethroids showed behavioral, hematological and physiological changes in fish. They cause histological changes inner organs: gills, liver, posterior kidney and leukocytes. They affect the fish reproduction and growth. Because of their toxic influence on fish and other aquatic organisms the pyrethroids should be used very carefully near surface waters and other water basins.

DE: pyrethroids, fish, toxicity

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 175–189.

TI: THE SURFACE WATER CHEMICAL COMPOSITION AND FISH HEALTH

AU: Lutnicka H.

AD: Department of Ichthyobiology and Fisheries, Agricultural University of Kraków

LA: English

AB: Good quality of surface waters is necessary condition to fish culture, hygiene of environment and fish good health. The water chemical composition contains two groups of substances: inorganic (elements, cations and anions) and organic – natural and anthropogenic. The most toxic elements to fish are heavy metals. They are always pollutants. Each natural element, cation or anion can be harmful to fish if its concentration in water is too high (Fe, Mn). Some of them can be harmful in specific water parameters, for example acid pH (aluminium). But the most dangerous substances are antropogenic organic once. Sources of them are: different sewage (industrial, domestic, municipal and thermal)

and rainfall (especially agricultural). They contain many different, toxic and dangerous substances for fish life. Substances often present in surface waters are pesticides (many of them are dangerous to fish), fertilizers – mineral and organic, detergents and others. The next big problem to resolve is the high concentration of biogenic elements in water connected with using of fertilizers in agriculture and detergents reach in phosphate. This is the reason of water eutrophication and disqualification of water destined to fish culture. In this article the main legal regulations connected with quantity of surface waters and monitoring are presented.

Changes of water parameters disturb fish homeostasis. They cause fish stress and secretion of cortisol in blood. The behavioural, physiological and immunological changes can be observed, too. The histopathological changes in fish inner organs, especially in gills, liver and kidney can be observed. The pollution of surface waters doesn't cause mass mortality of fish, but the vulnerability to diseases (bacterial or viral infections) is higher and mortality of unfit fish.

DE: surface water chemical composition, fish health

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 191–202.

TI: THE ANALYSIS OF CHEMICAL COMPOSITION AND THE PROFILE OF FATTY ACIDS OF MEAT KIDS AND LAMBS

AU: Łukaszewicz M., Pieniak-Lendzion K., Horoszewicz E., Niedziółka R.

AD: University of Podlasie, Siedlce

LA: Polish

AB: The research material were white and noble race's kids and lambs of polish lowland ship. The animals had been fed to 120 days of age, nextly slaughtered. Obtained fats were cooled for 24 h with temperature around 4°C. The sample of the longest dorsal muscle were tested in association with content of dry weight, protein and ash. The composition of fatty acids was marked with gas chromatography method using chrome machine five. The analysis of chemical composition demonstrated higher content of protein (1,68 u. r. more) and dry weight (0,19 u. r. more) in kids muscle tissue. The lambs had less content of it. If there is a speech about unsaturated fatty acids, which are important for humane, there should be given the information that statistically, huge differences were observed in oleic acid content area (C_{18:1}). The kids muscle contained 2,43 unit rates more than lambs. The kid's meat characterized a higher share of unsaturated fatty acids group (also one and polyunsaturated in it). More favorable profile of fatty acids was observed in the kids muscle tissue. It shows that more nutritional values has kid's meat.

DE: kids, lambs, meat, chemical composition, fatty acid

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 203–210.

TI: THE FATTENING AND SLAUGHTER VALUE AND MEAT VALUE OF FATTENER AFTER SOWS NAIMA, CROSSBREDS [P.L.W. x P.L.] AND BOAR P-761

AU: Madejek-Świątek E.¹, Gajewczyk P.²

AD: ¹ Cargill Co. Wrocław

² Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: In rearing pigs for fattening in addition to those environmental significant impact on the size characteristics of vital economic is the genetic value their parents. In order to convince the experiment has been carried out on two genotypes pigs for fattening, on the holding of average and similar conditions of rearing in the Lower Silesia. Assessing the value of fattening, slaughter and meat were 242 pigs for fattening crossbreeds [Polish Large White x Polish Landrace x P-76] and 195 crossbreeds [Naima x P-76]. In both cases the father of the

fatteners was a boar P-76. In turn, the maternal material differed in place of origin. The sows [Polish Large White x Polish Landrace] were from Poland whereas Naima was from France. The study shows that under the influence of slaughter and the meat content of carcass were better after the Polish sows compared with the French. The fatteners [Polish Large White x Polish Landrace x P-76] characterized by major hot carcass weight and hot dressing percentage compared with the fatteners [Naima x P-76]. The differences between the average values of these characteristics were statistically confirmed ($P \leq 0.05$).

DE: fatteners, genotype, fattening and slaughtering value

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 211–220.

TI: IMPORTANCE OF TRAINER'S EVALUATION ABOUT NATURAL PROPERTIES OF JUMPING HORSES AND TRYING TO USE IT TO ESTIMATION THE SPORT VALUE OF JUMPING HORSES

AU: Neuberg-Zuchowicz K., Geringer de Oedenberg H.

AD: Department of Horse Breeding and Riding, Institute of Animal Breeding, Wrocław University of Environmental and Life Science

LA: Polish

AB: Evaluation of natural properties of sport horses is the part of trainer's work. The trainer of the horse decide about way of training process and about a sport carrier of each horse. The aim of study was analysis of trainer's evaluation about natural properties and analysis of sport results of jumping horses. Also was trying to estimation sport value of horse on the basis for trainer's evaluation.

In the researches were used 47 Noble Half-Bred Horses from four stables in Lower Silesia, competing in 2008–2009. Natural properties were determined to questionnaire which trainers responded (NZP). The questions applied to gaits, jumps, broken to ride, "intelligence" and temperament. Sport results was determine to Sport Success Index (WSS), which allowed for the place in the competition, number of horses in competition, points for the class of competition and range of competition. The analysis of variations and regression were used.

The influence of trainer on the WSS didn't found. Mainly elements evaluated in horses should be the gaits, jumps and temperament. Behaviour's unbalanced horses had worse notes for gaits. Behavior of the horse was significant influence on subjective evaluation of natural properties. Most of trainer's evaluations weren't adequate to sport results.

DE: jumping horses, Sport Success Index

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 221–233.

TI: TEST OF AIR MICROFLORA IN DAIRY CATTLE BARN

AU: Olszewska H.¹, Skowron K.¹, Skowron K.J.², Erdmann P.K.¹

AD: ¹ Department of Animal Hygiene and Microbiology of the Environment, University of Technology and Life Sciences in Bydgoszcz

² Department of Microbiology, University of Technology and Life Sciences in Bydgoszcz

LA: Polish

AB: All microorganisms present in the husbandry environment may become a part of a biological bioaerosol creating microbial pollution of air. This pollution largely determines the health status of livestock and biosafety of livestock products.

The aim of researches was determination the level of microbial contamination of air in the dairy cows barn with taking into account the chosen microclimatic parameters.

Researches were carried out in the dairy cows barn. Animals were breeding on a litter. Samples for microbiological testing were collected once during each month from the feeding passage and dunging passage. The number of microorganisms was determined using the sedimentation and collision method. During the analysis of air microflora the total number

of bacteria, the number of staphylococci, hemolytic bacteria, bacteria from Enterobacteriaceae family and the total number of fungi were determined. In addition to microbiological researches an assessment of microclimatic conditions in the dairy cows barn were also carried out.

Examined microclimatic parameters took values, which provide the welfare of animals maintained in the barn. In air samples the total number of bacteria was 371–764 cfu·m⁻³ for the sedimentation method of, and 21 500–51 833 cfu·m⁻³ for the collision one. The most numerous group were the bacteria of the Staphylococcus genus, and microorganisms from the Enterobacteriaceae family were isolated in the lowest number. The total number of fungi isolated in the sedimentation method was at the level of 141–369 cfu·m⁻³, and in the collision method was 2 122–10 267 cfu·m⁻³.

DE: microbiological air pollution, the barn, sedimentation method, collision method

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 235–243.

TI: GENEALOGY AND MEASUREMENTS OF THOROUGH BRED FEMALE LINE IN NATIONAL STUD KOZIENICE

AU: Pawlina E.¹, Jodkowska E.², Jarek A.¹

AD: ¹ Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Sciences

² Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The aim of this study was characteristic of 251 thoroughbred mares from 12 female lines in the National Stud Kozienice, in years 1947–2009. The most numerous were lines Solina – 68 mares and Brzytwa – 33 mares. In the Lardoir and Nivea lines there was the least number of mares – 11. Cedra, Czapla, Czarka, Nivea and Via Doria lines should be considered as extinct ones in Kozienice Stud. 16 mares of the analyzed lines were included in breeding in 2009. Most of them were from Solina and Jaźwa lines what proves their established breeding value. However, considerable number of mares eliminated as a result of culling is a worrying issue. As a result of biometric analysis it was found that the mares of Czapla line were the highest, and they differed significantly from Cedra and Jaźwa. Also daughters of Czapla and Czarka were significantly higher than the offspring of Awaria II and Jaźwa. In the case of cannon circumference, the Czapla line significantly exceeded the Cedra line. Bay coat dominated almost in each line, with the exception of Via Doria, where most mothers were grey. Chestnut mares were the most numerous in the Brzytwa line. The profitability of thoroughbred horses breeding with respect to horse racing organisation in our country should be considered when looking for the reasons of continuously decreasing mares number in selective herd.

DE: thoroughbred , mares, lines, conformation, colour

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 245–258.

TI: THE COMPARISON OF ANALYTICAL METHODS USED TO DETERMINE THE G-CLASS IMMUNOGLOBULINS LEVEL IN COWS SERUM AND COLOSTRUM

AU: Pecka E., Zachwieja A.

AD: Institute of Animal Breeding, Department of Cattle Breeding and Milk Production, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The research material were samples of colostrum and blood collected from 12 cows of the Polish Holstein-Friesian breed, black and white type. Colostrum was collected from the first full milking after the parturition. Blood samples were collected in the 4th week after calving. The two kind of analyses was used to mark the level of G-class immunoglobulins in the

blood and colostrums samples: one of them was the ELISA test (Bethyl Inc. kit), and the second one was a electrophoresis method based on polyacrylamide gel. The accuracy of the used analysis method was specified, also the regression and correlation coefficient between obtained results was set. Used methods were compared in the range of duration time and ease of indications. In the analysis of colostrums and serum done by the electrophoresis method, the IgG level was lower with the higher standard deviations value which means the higher variability of values obtained and consequently lower precision of the analysis. The correlation coefficient between the values obtained by these methods was 0.76 for serum, and 0.66 for colostrum samples. These values mean a positive linear relationship between variables. As a result, theoretically, we can compare the results obtained by ELISA test and by electrophoresis method. The methods described have a similar ease of an implementation. They can be used both in quantitative and qualitative analysis. However there are different as regards time consumption. Analysis of 44 samples of serum and colostrum by electrophoresis method took about 30 hours to make, while marking the level of immunoglobulin on a single plate in the ELISA test (maximum 40 samples) took around 20 hours.

DE: cows, colostrum, serum, IgG, ELISA, electrophoresis
SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 259–270.

TI: AGE, RATE OF GROWTH AND CONDITION OF VIMBA *VIMBA VIMBA* (L.) FROM THE SPAWNING PART OF POPULATION FROM THE REGA RIVER IN 2004

AU: Raczyński M., Keszka S., Czerniejewski P.

AD: Department of Fisheries Management, West Pomeranian University of Technology of Szczecin

LA: English

AB: The study was performed on 38 Vimba fish caught in May, 2004 in the Rega river. The parameters determined were weight and total length of individuals in this sample. By the commonly used methods the rate of increase in weight and length and general fish condition were estimated. Age analysis revealed 5 age groups from 5+ to 9+, while the greatest number of individuals represented the age groups 5+ and 6+ (78.95%). The highest rate of increase in length was observed in the first four years of age (annual growth reaches over 40 mm), later the increase was smaller. In comparison with the other populations the fish from the Rega river show a high rate of growth, only little lower than that established for the Vimba population from the Vistula river, studied in the middle of the 20th century.

DE: Vimba, age, growth rate, Rega river, condition
SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 271–280.

TI: MORPHOLOGICAL CHARACTERISATION OF SICHEL *PELECUS CULTRATUS* (L.) FROM THE VISTULA BAY

AU: Raczyński M., Krzemińska K., Czerniejewski P.

AD: Department of Fisheries Management, West Pomeranian University of Technology of Szczecin

LA: English

AB: Twenty five measurable and ten meristic features were determined for 107 individuals of *Pelecus cultratus* caught in April and May, 2002 in the Vistula Bay. The results were subjected to statistical analysis to find the mean values, standard deviation, standard error, variation coefficient. To reveal differences between males and females, the U Mann-Whitney test was applied. As followed from the concentration and discrimination analyses, the feature that distinguished males from females was the predorsal length. Comprehensive analysis of morfometric features of the sichel population studied showed that they are

characterized by the range of variation which is typical of the sichel population from the Vistula Lagoon. One feature that distinguishes the population studied from those coming from other reservoirs was a greater number of lateral line scales.

DE: sichel, Vistula Lagoon, morphometric features, phenotypic variability

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 281–292.

TI: SEARCHING FOR LEPTIN GENOTYPE, PROLACTIN RECEPTOR GENOTYPE AND CHOSEN ENVIRONMENTAL FACTORS INFLUENCE ON SPERM QUALITY IN BOARS (*SUS SCROFA DOMESTICA*)

AU: Sieńko K., Wierzbicki H.

AD: Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Science

LA: Polish

AB: The aim of the study was the statistical analysis of the influence of leptin genotypes (*LEP*), prolactin receptor genotypes (*PRLR*) and selected environmental factors on boar's semen traits. 89 boars with known leptin genotype and 89 with known prolactin receptor genotype were examined. They belonged to 10 breed groups kept in AI station in 1996–2002. 9285 ejaculates were collected from boars with known genotype, and 9708 ejaculates from those with *PRLR* genotype.

Polymorphism in *LEP* and *PRLR* was detected with PCR-RFLP method with *AluI* restrictive enzyme for *PRLR* gene and *HinfI* for *LEP* gene. Two alleles were identified for *LEP* gene: *C* and *T* with 0,17 and 0,83 frequency, respectively. The genotypes frequency were as follows: *CC* – 0,03 *CT* – 0,28 and *TT* - 0,69. In *PRLR* gene *A* and *B* alleles were identified with 0,72 and 0,28 frequency, respectively, whereas the genotypes appeared with frequency: *AA* – 0,52, *AB* – 0,40, *BB* – 0,08. Statistical analysis revealed that different variants of leptin and prolactin receptor genotypes can be significant for studied semen parameters ($P \leq 0.01$). Boars with *AB* and *BB* prolactin receptor genotype dominated over those with *AA* genotype as far as all semen traits were concerned. Another analysis, performed on ejaculates collected from boars with leptin genotype, revealed domination of *TT* genotype over other ones as far as semen volume, percentage of alive sperms, number of sperms in ejaculate, total number of sperms in insemination dose and number of insemination doses were concerned. Boars with *CC* genotype had the highest sperm concentration in ejaculate. Furthermore, it was demonstrated that effect of insemination station, breed and interaction of these two effects had influence on none of the semen traits. Other effects were statistically significant for semen quality.

DE: boars, semen quality, leptin genotype, prolactin receptor genotype

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 293–303.

TI: CYTOLOGICAL QUALITY OF BOVINE MILK PRODUCED IN SMALL HERD

AU: Staszak E.¹, Danek J.¹, Piwczyński D.²

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² Department of Genetics and Principles of Animal Breeding, University of Technology and Life Sciences in Bydgoszcz

LA: Polish

AB: In present paper the results of somatic cells count (SCC) in bovine milk observations were described. The studied herd had a population of 30 cows grazed pasture in the summertime. Farm paid special attention to a good level of animal welfare. Quality of milk obtained in summer season from cows grazed pasture was higher compared to other seasons, however SCC in milk observed generally in the study was lower comparing to the results reported by

other authors, what can indicate good udder health and high welfare level. Cows in first lactation produced milk with lower SCC compared to multiparous cows and SCC significantly increased as the lactation progressed which is similar to observations presented by other authors.

DE: cows, milk, SCC, welfare

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 305–312.

TI: EFFECT OF DIETARY CONJUGATED LINOLEIC ACID, VITAMIN E AND PLANT OILS ON FATTY ACID COMPOSITION , LIPID OXIDATION AND QUALITY OF CHICKEN MEAT

AU: Szymczyk B., Frys-Żurek M.

AD: Department of Animal Nutrition and Feed Science, National Research Institute of Animal Production, Balice

LA: Polish

AB: Effect of dietary conjugated linoleic acid, vitamin E and plant oils on fatty acid composition, lipid oxidation and quality of chicken meat was investigated.

Experiment was performed on 574 broiler chickens of a commercial strain (Cobb) randomly allocated to 24 dietary treatments. There were three replicates for each treatment, and each replicate cage contained eight broiler chickens. During rearing period between 22nd to 42nd day of life chicken were fed with grower and finisher mixtures in which four levels of conjugated linoleic acid CLA (0.0; 0.5; 0.75 and 1%), three levels of vitamin E (0; 150 and 300 mg kg⁻¹) and two mixtures of plant oils (olive oil + linseed oil and rapeseed oil + linseed oil) were used. At 42 d of age birds were stunned and slaughtered and samples of breast muscle were taken for analyzes. Gross composition, fatty acids and malonic aldehyde (TBA-RS) content were analyzed in meat samples. Acidity (45 min. after slaughter and after 24 h cooling), meat colour and water holding capacity were also estimated. CLA supplement had no significant effect on dry matter content of breast muscles but increased protein content ($P < 0.05$) and lower fat content. In the case of 1% CLA supplement these difference were also significant ($P < 0.01$). CLA supplement distinctly affected the breast muscles colour: it lowered lightness (L), redness (a) and yellowness (b). They lowered accordingly with increasing amount of CLA in feed. CLA increased also water holding capacity but significant differences comparing to control group were found only in the case of CLA content 0.75 and 1%. Vitamin E supplement increased content of this vitamin in meat and improved oxidative stability of intramuscular fat. TBA lowered during 2 weeks or 6 months of meat storage. CLA supplement resulted in higher content of both its used isomers in meat. It also increased ($P < 0.01$) content of saturated fatty acids (SFA) in the breast muscles at the cost of monounsaturated (MUFA) and polyunsaturated fatty acids (PUFA). The tissue lipids of chickens fed with rapeseed oil contained less of SFA and MUFA but more of PUFA than those with olive oil.

DE: CLA, vitamin E, vegetable oils, broiler chickens, meat quality

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 313–322.

TI: UTILITY VALUE OF THE SPORT DRIVING HORSES IN POLAND IN THE YEARS 1995–2009

AU: Śpiewak J., Badura N., Drozdowska M., Geringer de Oedenberg H.

AD: Department of Horse Breeding and Riding, Institute of Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: Estimation of utility values of sport driving horses in the years 1995–2009 was studied.

For the purpose of this paper 343 horses, which take part in CAI in class L,N,C, Polish Breeding Championships for Young Horses (4-, 5-, 6- yr-old), Polish Championships, World Championship and CAI in Poland and foreign have been surveyed.

Their results have been analyzed, the sum of points for all competitions and average of points on start. This constituted the base for assessment of the utility value of each horse. The horse representing the highest utility value depending on sum of points for all competitions all career is Bogacz (Silesian horse). Instead the highest utility value depending on average points on start hale obtained Sejmik (Silesian horse). In this paper has been proved the influence father on average points obtained by descendants. According to this disturbing is fact that the stallions with the highest estimated breeding values are poorly utilized in breeding driving horses.

DE: utility value, driving horses

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 323–332.

TI: PROFITABILITY OF FLOCK FATTENING

AU: Środoń S., Jasiński L., Jankowska-Mąkosza A., Knecht D.

AD: Institute of Animal Breeding, Department of Pig Breeding, University of Environmental and Life Sciences

LA: Polish

AB: The objective was to determine the level of flock fattening profitability, as an example of Commercial Production Companies “FERMA-POL” in Zalesie. Thesis includes financial analysis of flock fattening from the years 2009 and 2010, and describes polish pork market detailed analysis of the period considered. Research tool that was used to write this dissertation was Integrated Agricultural Market Information System (IAMIS). In 2009 achieved a positive financial result. Total profit from flock fattening amounted to 1 558 315.35 zł, reflecting favorable market conditions of pork producers in this period. The year 2010 was the opposite of the previous year. The increase in grain prices contributed to higher costs of pigs production. Additionally, the manufacturers situation worsened at low pork prices. As a result of flock fattening was unprofitable, and reached a loss of -1 537 785.71 zł. Polish pork market is very dynamic, which means that manufacturers cannot predict changes in prices. Frequent and unexpected price fluctuations lead to a destabilization of the market and reduce the profitability of pig production.

DE: profitability, flock fattening, pork market, IAMIS – Integrated Agricultural Market Information System

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 333–345.

TI: THE EFFECT OF MEDICINAL HERBS ADMINISTERED TO BROILER CHICKENS IN THE PRE-SLAUGHTER PERIOD ON THE PHYSICOCHEMICAL PROPERTIES OF MEAT

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LA: Polish

AB: Broiler chickens were administered medicinal herbs for the last seven days of the rearing period, in the winter, to determine their response to pre-slaughter stress, based on the physicochemical properties of meat.

It was found that the supplementation of broiler diets with a mixture of medicinal herbs, containing goat's rue, common nettle, lemon balm and common sage, and longer transport distances (0, 100, 200 and 300 km) affected the quality attributes of meat. Meat from broilers receiving diets supplemented with medicinal herbs was characterized by higher acidity (pH₁₅ 6.24, pH₂₄ 6.01), a lighter color (50.09 vs. 48.06) and a smaller liquid area (3.12 cm²), compared with the control group. Transport over longer distances led to an increase in meat acidity (pH₁₅ – from 6.09 to 6.30, pH₂₄ – from 5.84 to 6.04) and a decrease in color brightness, measured 24 hours post mortem (from 48.77 to 47.01), which contributed to the occurrence of DFD meat. The results of the study suggest that pre-slaughter management practices caused stress in birds, which was partially alleviated by the administration of the analyzed herbal mix.

DE: broiler, pre-slaughter handling, herbs, quality of meat

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583, 347–354.

TI: THE EFFECT OF MEDICINAL HERBS ON THE WELFARE OF BROILER CHICKENS DURING PRE-SLAUGHTER HANDLING, DETERMINED BASED ON SELECTED BLOOD PARAMETERS

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LA: Polish

AB: The aim of this study was to determine whether a mixture of medicinal herbs can be used to improve the resistance of broiler chickens to stressors during pre-slaughter handling. The hematological and biochemical parameters of broilers were analyzed.

It was found that pre-slaughter management practices, including transport over different distances, caused stress in birds leading to changes in blood parameters. Long-distance transport (100, 200 and 300 km) contributed to a significant increase the concentrations of corticosterone and uric acid, and the values of hematocrit, leucocytes and the H:L ratio, and decrease the glucose concentrations.

Broilers that received diets supplemented with medicinal herbs for 7 days were characterized by significantly higher hemoglobin levels, and a significantly lower H:L ratio and uric acid concentrations. A trend towards lower corticosterone concentrations and transaminase activity was also noted. The above indicates that a mixture of local medicinal herbs, containing goat's rue, common nettle, lemon balm and common sage, can be used for stress prevention in broiler chickens, thus improving their welfare during the pre-slaughter period.

DE: broilers, pre-slaughter handling, stress, herbs, blood parameters

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 355–362.

TI: THE BASE OF NOURISHMENT, CHARACTERISTIC OF POPULATION AND BREEDING SEASON OF WILD BOARS (*SUS SCROFAFA*) IN THE KACZAWSKIE MOUNTAINS

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LA: Polish

AB: The information about yielding domesticated plants and seed production of beech and oak was taken during 2000–2005 years in areas of Lwówek Śląski, Jelenia Góra (in Poland) and Ersrode (in Germany). The range and strength of their availability as a potential base of nourishment for wild boars were estimated. The age of sows was determined based on tooth formation. This information was useful to evaluate the month of effective covering of sows. During 5 years the growth of supply of energy per 1 ha ranged from 6 up to 7% in Poland and Germany. The autumn and winter months influence on cover of wild boars. The heat also occurred in other months but the frequency was lower (the lowest level was observed during April, May and June). The concentration of estrogen in blood serum (which was taken from hunted sows) corresponded with day of heat occurring (which was determined by tooth formation).

DE: wild boars, base of nourishment, breeding

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 363–376.

TI: ZEARALENONE CONTAMINATION OF MAIZE IN DIETS FOR WILD BOARS (*SUS SCROFAFA*) IN THE KACZAWSKIE MOUNTAINS

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AD: ¹ Veterinary Surgery Miłków near Jelenia Góra

² Department of Animal Nutrition and Feed Management, University of Environmental and Life Sciences

LA: Polish

AB: The purpose of carried out investigations was to estimate the presence of zearalenone in maize samples that were taken from maize stems, stubble field and stomach contents of wild boars that were hunted near maize plantation during 2000–2004 years in the Sudetes foothills. The obtained results show that maize taken from maize stems had not zearalenone contamination. But this micotoxin contamination was analyzed in samples that were left in the stubble field or were plowed from October up to April. During that period the wild boars fed the maize with the contamination. But the seeds were not the main component in diet of the animals.

DE: zearalenone, maize, wild boars

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 583: 377–384.

TI: ANALYSIS OF CHEMICAL CONSTITUTION OF PECTORAL MUSCLES IN PIGEONS

AU: Zieleziński M., Pawlina E.

AD: Department of Genetics and Animal Breeding, Wrocław University of Environmental and Life Sciences

LA: Polish

AB: The aim of investigation was to compare of quality meat traits in pigeons of four breeds: King, Strasser, Wrocławski meat and Homing pigeon 28 day old young birds were killed. In chemical analysis pectoral muscle (*Musculus pectoralis maior*) was used. The following components were examined: total cholesterol, free water, colouring (I*, a*, b*) and pH₂₄. Contents of fat, collagen and cholesterol were on low level in all of investigated breeds what

showed the great culinary and dietetic usefulness of pigeon meat. Protein content in pectoral muscles in examined breeds was similar (18,48–19,12%).

DE: pigeons, protein, fat, cholesterol, muscles colouring

SO: Zesz. Nauk. UP Wroc., Biol. Hod. Zwierz., LXIII, 585: 385–391.