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Zs. Nemes – P. Perišič – L. Szabára – A. Gáspárdy:

HETEROSIS IN REPRODUCTIVE TRAITS ESTIMATED FROM AN UPGRADING BREEDING PROGRAM. 2. “DAYS OPEN” AND PREGNANCY RATE
The research goal of the authors was to evaluate the success of the re-breeding, and the heterosis manifested in the pregnancy rate, regarding the six intermediate generations of an upgrading breeding system. The data base contains altogether 27,241 records of the initial purebred Simmental and Holstein-Friesian as well as of the intermediate Holstein-Friesian crossed cows from Serbia, from the last four decades (1971–2008).

They established that Simmental cows became pregnant earlier (on day 123) on average than the Holstein-Friesians (on day 155). The F1–R3 from the intermediate genotypes show resemblance to the Simmental, while the R4–R5 genotypes do this to the Holstein-Friesian (p<0.001). In the pregnancy rate calculated by pp day 70, 140 and 210 the Simmentals together with the F1–R3 genotypes regularly reach higher values (15.4–21.7, 57.3–63.6 and 76.7–82.2%, respectively) than the purebred Holsteins together with the R4–R5 genotypes (8.7–12.1, 47.3–52.2 and 67.6–73.7%, respectively) to a significant degree (p<0.001).

The heterosis appears at opposite direction and extent in the non-return rate calculated by different pp days. With regards to the success of re-breeding by pp day 70, a statistically proven, positive complementary effect emerging in R2 occurs in all the crossed generations. Evaluating the re-breeding by pp days 140 and 210, the recombination along with the heterosis became negative in R5 generation, while the heterosis remains positive, also favourable in all the other genotypes.

The authors could detect the advantage of heterozygotes in the investigated reproductive features to a high degree. However, they had
the chance to present the very rarely discussed form of heterosis, the transitheterosis. In occasion of transit- (transitional- or age dependent) heterosis the advantage (or disadvantage) of a given heterozygous genotype compared to the other genotypes will disappear (or manifest) by change of age or period of life.


**CLOSTRIDIUM PERFRINGENS D ENTEROTOXAEemia IN GOAT. CASE REPORT**

The authors present the case of a 7 years old female, alpine breed goat that was in bad clinical condition at admission. The physical examination showed severe shock, dyspnoe, rumen atony and the absence of urine. The laboratory tests also showed nephropathy (increased carbamid and creatinine concentration). In contempt of intensive treatment (fluid therapy, antibiotics, NSAIDs, glucose) the goat died one week later and because of the case history, clinical signs, pathogenesis and the necropsy findings (e.g. kidney lesions) the disease was considered to be *Clostridium perfringens* type D enterotoxaemia.

The authors review the incidence, epidemiology, pathogenesis, clinical signs, necropsy findings, prevention and treatment of the disease: the possibilities and limitations.

**CHANGES IN THE BLOOD PARAMETERS OF MARGINATED TORTOISE (TESTUDO MARGINATA) DURING BREADING SEASON**

The authors measured the chemical values of blood parameters in protected European tortoise species (*Testudo* sp.), Marginated tortoise (*Testudo marginata*) during breeding season. They used 5 males and 5 females in the study and the values are reported in Table 2. The examination focused on the calcium and triglyceride levels which showed significant differences between the two genders. The females produce the follicles and eggshells during this time of the year (May) so the measured levels were physiologically higher.

É. Váradi – B. Végi – K. Liptói – J. Barna:

**CRYOPRESERVATION PROTOCOLS OF GUINEA FOWL SPERM**

Supporting the rescue of the valuable indigenous domestic animal species is an important part of the new Hungarian agricultural strategy. In the case of poultry species semen cryopreservation is the most practical method for the long term storage of the genetic material. So far, only a single study is available on the freezing of guinea fowl sperm. In the study three freezing protocols were compared: a slow, programmable method with two different cryoprotectants – 10% ethylene glycol (EG), and 6% dimethyl-formamide (DMF) – and vitrification in pellet form, using 6% dimethyl-acetamide (DMA). During
the in vitro sperm qualification the analysis of membrane integrity was made with eosin-aniline staining. The efficiency of the protocols which produced more acceptable sperm survival was controlled by artificial insemination, as well. For fertility determination candling of incubated eggs was used, extended by checking of the ratio of early embryonic mortality.

Two freezing protocols (programmable with 10% EG and pellet) resulted in good survival rate of live, intact spermatozoa (23 vs. 29%, respectively), while slow freezing with DMF produced only 11% survival rate. The differences between slow and fast freezing proved to be significant (p< 0.05). Artificial insemination was made with fresh and two kinds of frozen/thawed semen (slow protocol with 10% EG and vitrification) in three experimental groups. For the 3rd week of insemination fresh sperm resulted 92, slow protocol 29 and pellet method 64% fertility. The proportion of early embryo mortality was remarkably higher in eggs coming from the groups inseminated with frozen thawed sperm. While the rate of fertility increased, the proportion of the early embryonic death decreased as a function of time in all groups.

N. Sztán – E. Várkonyi Patakíné – K. Liptói – J. Barna:

**OBSERVATIONS OF EMBRYONIC CELL MANIPULATIONS IN DIFFERENT POULTRY SPECIES**
Main aim of the study was the reliable maintenance of the genetic diversity of domestic poultry breeds, above the maintaining of living populations. Nowadays, major part of poultry’s genetic pool is listed on local, domestic species lists, and handled as highly endangered species. Conservation of the genetic material by cryopreservation of semen is only partly feasible, because – in the case of birds – female is the heterogametic sex (ZW). Therefore, with long term conservation of spermatozoa the recovering of the wanted genotype is possible only by at least six generation of backcrossing.

The alternative of the conservation of the whole genetic material is cryopreservation of the embryonic cells, and afterwards reimplanting them into the recipient embryo. The final goal is the creation of germline chimeras containing the entire genome of the donor.

The authors elaborated a simplified method of blastodermal cell transfer in three poultry species, which does not require expensive instrumentation and decently efficient. The detailed description of the methods and the preliminary results are presented. By the procedures 18.6%, 6.5% and 2% phenotypic chimeras were obtained for hens (Gallus gallus domesticus), turkeys (Meleagris gallopavo gallopavo) and geese (Anser anser domestica), respectively.

M. Liptovszky – E. Sós – V. Molnár:

**COMPARISON OF THREE DIFFERENT KETAMINE–A₂-AGONIST COMBINATION FOR SEDATION OF BARBARY SHEEP (AMMOTRAGUS LERVIA)**
In a large scale zoo reconstruction project a total number of 19 Barbary Sheep (*Ammotragus lervia*) were transported to other zoos from Budapest Zoo and Botanical Garden in 2005. Animals were immobilized by using three different combination of ketamine and an $\alpha_2$-agonist by flying syringe. The combinations were KX – 3 mg/bwkg ketamine and 3 mg/bwkg xylazine or KM1 – 1.5 mg/bwkg ketamine and 60 µg/bwkg medetomidine, or KM2 – 2 mg/bwkg ketamine and 60 µg/bwkg medetomidine. The transport of the animals was carried out in two phases. In the first one only combination KX was used, but at the second part of the transport animals were allocated randomly into two groups and combination KM1 and KM2 were used. After immobilization, the animals were checked, blood was drawn from v. jugularis and pulse rate and respiration rate were measured. In the second phase, time from the injection to lateral recumbency was also measured. If combination KM1 was used, sedation was very light, even for this non-painful procedure. Pulse and respiratory rates were not significantly different in the three different combinations. Time to lateral recumbency (onset of action) was significantly shorter when combination KM2 was used, compared to combination KM1. The authors recommend to use either combination KX or KM2 for anaesthetic procedures with or without minor pain in Barbary Sheep.

G. Majoros – M. Puky:

**NEGATIVE RESULT OF PARASITOLOGICAL EXAMINATION OF AN INTRODUCED SPECIMEN OF INVASIVE CHINESE MITTEN CRAB**
A straggling specimen of Chinese mitten crab (Eriocheir sinensis) was caught in Budapest, Hungary in October 2011 and was subjected to parasitological examination. It was suspected that the crab had been introduced intentionally from Asia. The animal did not have any parasitic infections that could have been hazardous to animals or humans. It had a mild infection with gregarines only. Mitten crab is an important intermediate host of Paragonimus lung flukes of Asian origin, so the possible parasitological investigation of imported living crabs by the authorities of public health may come to the front in the future.

P. Laczay:

CARCINOGENIC CHEMICAL SUBSTANCES IN THE FOOD CHAIN

At least one third of cancers are thought to be directly associated with foods and dietary behaviours. The vast majority of potentially carcinogenic agents are foreign chemical substances that may enter the foods either at the early phase of the food chain, in the primary production or later during food processing and preparation. Following a short description of the possible mechanisms of chemical carcinogenesis, the classification of the carcinogenic agents and the basis of their risk assessment, this review highlights the possible carcinogenic effects of the main chemical contaminants of
environmental, biological and technological origin, briefly discusses whether artificial sweeteners bear a carcinogen risk and present some natural substances in foods that might contribute to reduce the potential cancer risk.

I. Tóth – G. Goszleth – V. L. Frenyó:

**THE MAJOR REGULATORS OF FEED-INTAKE: GHRELIN, LEPTIN AND THEIR INTERACTIONS. LITERATURE REVIEW**

The authors summarize current knowledge on the roles of ghrelin and leptin in the central regulation of feed-intake. Considering that the final outcome of such hormonal effects is the result of combined hormone actions, the authors also discuss the interactions of ghrelin and leptin. Ghrelin is primarily secreted in the stomach and conveys hunger signal to the hypothalamus. Leptin is mainly released from the fatty tissue and represents satiety signal in the hypothalamus. Thus, the two of these hormones function as two trays of a balance to set the activity of hypothalamic effector neurons to the actual metabolic needs of the organism. The authors discuss the neuronal basis of this balanced hormone action and the influential effects of the inner and outer environment.