Evaluation of reproductive parameters at a farm specializing in breeding of Czech Fleckvieh dairy cows

Kristyna Kocianova, Radek Filipcik, Zuzana Reckova, Vojtech Pesan

The aim of this study was to evaluate the level of selected reproductive parameters at a farm specializing in breeding Czech Fleckvieh dairy cows. The study was carried out at the farm AZOS, s. r. o. Zakřany. Reproductive parameters were assessed in 291 cows in the years 2017, 2018 and 2019. The longest calving interval was 400 days for cows on the 4th lactation and there was not a statistically conclusive ($p>0.05$) difference. The shortest calving interval of 378 days was found in cows at 2nd lactation and there was not a statistically conclusive ($p>0.05$) difference. Cows had more difficult calvings when they had twins than when they had one offspring. It was also established that the length of gestation was shorter in twin pregnancies. There was a statistically conclusive ($p\leq0.01$) difference in gestation length for cows with a single offspring, where the length of gestation was 285 days, and cows with twins, which were pregnant for 279 days.

Keywords: **Czech Fleckvieh cattle, reproduction, reproductive parameters**

Determination of optimal insemination time in sheep by assessing cervical mucus arborization

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Insemination and estrus synchronization are one of the most used biotechnological reproductive methods used in sheep breeding, but also in most other livestock species. Subsequent insemination values are influenced by several factors such as age, condition, health, hereditary establishment of the animals, quality of the insemination doses and the quality of the performance of the insemination itself. Another way to optimise the insemination values is to determine the optimal time for insemination, which varies between livestock species but may also vary slightly within the individuality of the individuals within the breed. One way of determining the optimal time for insemination is to assess the arborisation of cervical mucus, which forms different types of structures after crystallisation at different stages of estrus. Changes in the arborisation structures are influenced by endocrine changes, by the action of oestrogen on the cervical glands, where electrolytes are concentrated and which, after association with mucin and subsequent crystallisation, form typical structures. The experiment took place from September 2020 (synchronization of estrus and insemination) to March 2021 (end of lambing). In this experiment, it was found that the type of crystallization structures at the time of insemination has a conclusive effect on the subsequent pregnancy rate. Animals with "V" type crystallization achieved the best pregnancy rate (80%).

Keywords: **arborization, cervical mucus, insemination, sheep, Zwartbles**

Condition of honeybee colonies overwintered with winter stores enriched by extracts of polypore mycelia

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The health of honeybees is current issue namely due to colony collapse disorder. The presence of healthy long-living honeybees is necessary for successful overwintering of the colony. However, vitality of the honeybees is threatened by the synergy of pathogens, pesticides and malnutrition. It was found that mushroom extracts decrease honeybee viral load. We tested a potential of the mycelial extracts (*Fomes fomentarius*, *Ganoderma lucidum*) as additive in winter stores for improving of the overwintering. Treated colonies showed a slight tendency to overwinter in stronger condition. The possible effects of tested mycelial extract are discussed.

Keywords: ***Fomes fomentarius*, *Ganoderma lucidum*, *Apis mellifera*, supplementation, colony growth**

The influence of different feed particle size in broiler diets on the performance parameters and digestive viscosity

Jakub Novotny, Lucie Horakova, Dana Zalesakova, Michal Rihacek, Vojtech Kumbar, Ondrej Stastnik, Leos Pavlata

The effect of different feed particle size used in broiler chickens' diet on performance parameters and chyme viscosity was evaluated. Broilers were divided into three different groups based on the structure of particles (coarse vs. medium vs. fine). Geometric Mean Diameter (GMD) (1,109.95 vs. 953.00 vs. 732.58) and Geometric Standard deviation (GSD) (1,067.75 vs. 845.23 vs. 611.70) of particles size were calculated. In the experiment were not observed statistically significant differences ($P > 0.05$) among dietary groups in the final live weight (2,415.50 g vs. 2,373.56 g vs. 2,423.17 g), feed intake (83.56 g/bird/day vs. 82.12 g/bird/day vs. 87.82 g/bird/day), carcass yield (64.70 % vs. 68.55 % vs. 68.49 %) and viscosity of chyme (5.46 mPa.s vs. 4.66 mPa.s vs. 5.36 mPa.s).

Keywords: **poultry nutrition, Geometric Mean Diameter, Geometric Standard Deviation, Ross 308**

The effect of breed on body indices in draft horses in Czech Republic

Alzbeta Matuskova, Veronika Coudkova, Radek Filipcik, Miroslav Marsalek

Growth of cold-blooded horses is rarely monitored, but the numbers of horses of breeds bred in Czech Republic are rapidly decreasing. Body indices are useful tools to monitor and evaluate horses' built and quality of growth. Thirteen body measurements of horses on four farms were taken every three months (227 sets of measurements) and five hippometric indices were calculated for 3 draft horses breeds: Czech-Moravian Belgian (CMB), Noriker (N) and Silesian Noriker (SN). The effect of breed on these indices was analyzed. The index of compactness (CI) and massiveness (MI) showed as affected by breed ($p<0.001$), when the value 114.17 of CI was significantly the lowest in SN and value 123.78 of MI was significantly the highest in N. The index of boniness ($p<0.1$) and skeletal strength ($p<0.1$) indicated statistical significance of breed effect. The index of body frame didn't prove statistically significant effect of breed at all ($p>0.05$). Populations of these horses are small, with more data would be possible to get clearer results and analysis of the effect of age would be a viable option.

Keywords: **draft horse, hippometric index, growth, colt, stallion**

Determination of the effectiveness of disinfectants containing organic acids for bovine footbaths

Lucie Langova, Miroslav Machacek, Zdenek Havlicek, Petra Nemcova, Ivana Novotna

Disinfection footbaths are a common practice for controlling and preventing the spread of infectious diseases causing lameness (dermatitis digitalis, footrot) in dairy cows. On the market there exists many disinfectants for cattle footbaths, but their effectiveness on farms is often disputable. In vitro tests were performed to verify the effectiveness of disinfection according to ČSN EN 1656. The effect of different disinfectants on bacteria in various concentrations at a specified temperature of 20 °C was verified. The aim was to determine their effectiveness even at temperatures of 10 and 5 °C, which are really in lavage baths on farms. Effectiveness verification of the disinfectant consists of ideal conditions of two steps, tests of the effectiveness of the disinfectant in the laboratory and controlled field conditions. Three disinfectants with organic acids (A) organic acids (lactic, propionic, formic), zinc, aloe vera, aldehyde, glycerin, (B) organic acid (lactic), zinc, copper and (C) iodine, organic acid (lactic) were tested in the laboratory by dilution-neutralization method and membrane filtration method. Laboratory tests have shown better bactericidal effects of organic acids in selected bacteria with another active substance (zinc, copper in disinfection B and iodine in disinfection C), colony-forming units were reduced by at least by 5 logs at low temperatures.

Keywords: disinfection, organic acids, footbaths, dairy cow, lameness, effectiveness

Methods for assessing the health of the limbs and their relationship to the duration of treatment for footrot: a pilot study

Petra Nemcova, Zdenek Havlicek, Lucie Langova, Ivana Novotna

Footrot is an infectious disease with a major impact on the health of dairy cows, their performance, reproduction and breeding economics. The timeliness of the diagnosis of footrot is therefore important in terms of treatment and prevention of the disease. The work aimed to verify and compare methods of identification of lame dairy cows by locomotion scoring and by infrared thermography. The study included 24 cows with footrot. It was found that the infrared thermography revealed a change in the health status of 25% of lame cows of patients with footrot in the preclinical phase, that is before of clinical symptoms were expressed. In dairy cows with a disease diagnosed by infrared thermography, the treatment time was shorter by 3.7 days, as the treatment time was 21.2 days in lame cows, compared to non-lame cows, but with an increased temperature score of 17.5 days. Due to the small number of animals, these differences were not statistically tested.

Keywords: cow, footrot, locomotion score, thermal score, infrared thermography, lameness

The effect of housing technology on the milk performance of Holstein dairy cows in selected breeding

Lenka Zapletalova, Milan Vecera, Gustav Chladek, Marketa Popelkova, Richard Langer

The goal of the research was to analyse the effect of the housing technology on the milk performance of Holstein dairy cows. The analysis took place in the Dubicka zemedelska Inc. between January and December in 2020. The analysis was performed on two technologies - the tie stall barn system and the loose-housing system. During the research were used the milk performance data and pooled milk samples data. We obtained and subsequently evaluated the data considering the number of cows, milk performance, fat and protein content of the milk, lactation sequence, lactation stages and the somatic cell count (SCC) in the milk. When comparing the tie stall barn system and the loose-housing system it was found that the housing technology did not have great impact on milk performance. However, it had a major impact on the somatic cell count in the milk. Using the loose-housing system had leaded to better results.

Keywords: **housing system, milk performance, Holstein dairy cows, loose-housing system, the tie stall barn system**

Evaluation of Holstein cows originated from embryo transfer

Marketa Popelkova, Radek Filipcik, Tomas Kopec, Zuzana Reckova

Embryotransfer (ET) is used in reproduction worldwide. This thesis deals with the evaluation of milk yield at Holstein cows that were from ET. This evaluation was done by performed flushes and transferring the offspring, born and included in the breeding during the years 2015 and 2016. All data for the experiment evaluation was obtained from an agricultural cooperative, which has three farms located in the region Pardubice. For statistical analysis of the data, we used multifactor analysis of variance. In 2015, 14 donor cows were flushed. A total of 212 embryos were obtained from which 113 embryos could be used. In 2016, 19 donor cows were flushed and 241 embryos were obtained, but only 113 embryos met the criteria. In the experiment, we evaluated the performance of daughters from embryo transfer and compared their performance with their peers (not from ET) born in the same stable and the same years. Performance evaluation was obtained during the first and second lactation. From the results, where the production performance is compared, it is evident that there was no statistically significant different production difference between dairy cows from ET and their peers.

Keywords: **embryo transfer, Holstein cows, donors, reproduction, milk yield**

Blood biochemical parameters in the evaluation of chicken nutrition during the starter feed period

Dana Zalesakova, Michal Rihacek, Jakub Novotny, Lucie Horakova, Ondrej Stastnik, Eva Mrkvicova, Leos Pavlata

The effect of age and different diets on the blood biochemical parameters of the 1 to 8-day-old Ross 308 broilers during the starter fattening period was evaluated. The chickens were divided into three different groups fed: a standard feed mixture (C – control group), a mixture with a 30% deficiency of crude protein (N group), and a mixture with a 30% deficiency of calcium, phosphorus, zinc, copper and selenium in the mineral premix (M group). Feed consumption and body weight didn't differ between groups ($P>0.05$) during the experiment. Significant differences ($P<0.05$) were demonstrated in biochemical indicators of nitrogen, fat, mineral and energy metabolism between 1st and 8th day of chicken's age. Depending on the different diets, at 8th day of age significant changes were detected mainly in the parameters of total protein, albumin, globulin, triglycerides, cholesterol and glucose. The parameters of mineral substances in blood were not affected by using diets with different nutrients content in present study.

Keywords: **poultry nutrition, Ross 308, mineral substance, crude protein**

The influence of organic and inorganic selenium sources on the metabolism of broiler chickens

Lucie Horakova, Jakub Novotny, Dana Zalesakova, Michal Rihacek, Ondrej Stastnik, Eva Mrkvicova, Leos Pavlata

The aim of the present study was to investigate the effect of organic and inorganic forms of selenium addition to the diet and their effect on the metabolism of broiler chickens. The study was conducted on 84 Ross 308 male broiler chickens which were divided into three groups. It was evaluated the average live weight, feed consumption, carcass yield and biochemical blood parameters in the study. Control group was fed a diet containing only natural content of selenium in the feed. Organic group was fed the organic source of selenium (*Saccharomyces cerevisiae* CNCM I-3060). Inorganic group was fed the inorganic source of selenium (sodium selenite – Na_2SeO_3). The selenium was added to its total content of 0.5 mg/kg of feed in both groups. The addition of selenium to the diets had no influence on average live weight, feed consumption at the end of trial and on the carcass, breast and legs yields. The analysis of blood biochemical parameters revealed a statistically significant difference ($P<0.05$) in glutathione peroxidase activity between the control and experimental groups. No significant differences in assessed traits of broilers were found between groups fed by organic and inorganic forms of selenium.

Keywords: organic selenium, broiler chickens, *Saccharomyces cerevisiae*, sodium selenite

Effect of storage and preincubation on hatching egg quality and hatchability in meat type chicken

Martina Pesanova Tesarova, Martina Lichovnikova, Marian Foltyn

The aim of the study was to evaluate the effect of hatching eggs storage and their preincubation on eggs quality, hatchability and one-day old chick weight in young meat-type ROSS 308 parent stock, 31 weeks of age. Total of 1920 hatching eggs were used in this experiment for incubation, for egg quality analysis. Eggs were divided into three groups and stored for 21 days. Group P0 was not treated by preincubation. Group P1 contained hatching eggs which were preincubated once at the fifth of storage. Group P2 contained hatching eggs which were preincubated at days 5 and 10 during storage period. Egg quality was analysed for fresh eggs too. Long storage and repeated preincubation decreased both egg weight and yolk dry matter ($P < 0.05$). After application of preincubation, the degree of embryonic development significantly increased ($P < 0.05$). Preincubation and 21day storage of hatching eggs had no effect on hatchability and embryonic mortality. The weight of day-old chicks significantly decreased in chicks hatched form eggs twice treaded by preincubation.

Keywords: **embryonic development, embryonic stage, broiler, quality of hatching**

The effect of stage and number of lactations on the incidence of milking success when using Automatic Milking Systems

David Jenik, Daniel Falta, Tomas Kopec, Milan Vecera, Francois Lategan, Gustav Chladek

One of the characteristics of automatic milking systems is that cows can visit the Automatic Milking System (AMS) voluntarily for milking. This leads to variations in the frequency of visits of cows to the AMS. The number of visits, rejections and volume of milk produced were studied using data from the private farm ZD Libín, located in the South Bohemian region. The dairy herd under observation consisted of 147 Montbeliarde cows. Data were collected from 1 January to 7 December 2020, creating a total of 23 389 data records. The average daily milk yield during the observation period was 33.7 kg milk per cow with a maximum of 59.3 kg milk per cow. Each cow in the herd was milked on average, 2.6 times per day. Only in rare cases were some cows milked less than twice or more than four times per day. Results show that high producing cows go to the AMS more often. During the first stage of lactation the cows produced an average of 35.9 kg of milk per day and were milked on average 2.8 times a day. Data further shows that 44.3% of cows were never rejected by the AMS because they were ready to be milked.

Keywords: **dairy cows, automatic milking system, rejection, Montbeliarde**