

## Abstracts of the “17<sup>TH</sup> HUNGARIAN CONFERENCE ON RABBIT PRODUCTION”

Kaposvár, Hungary. May 25, 2005.

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### Production

**CURRENT SITUATION IN THE RABBIT PRODUCTION IN HUNGARY.** KLING J. *Rabbit Production Board. 14, 1161 Budapest, Hungary.*

In 2004, the total quantity of the Hungarian rabbit production was 12,074 tons in live and 5,287 tons of carcasses. Very special for Hungary is that the 97-98% of total production is exported, while, the proportion of the Hungarian market is very low (2-3%). In 2003, Italy had 43%, Switzerland 28% and Germany a 19% share from the Hungarian export. The shipments included 52% whole carcass and 48% cut products. Earlier, 95-98% of the rabbits were produced at small farms, but now about 85-90% of the total production originates from large farms of some hundred or thousand does. The production conditions of these large farms are fully conform to the EU requirements. The most popular breeds are Pannon White (43%), Hycole (20%), Hyplus (15%), Debrecen White (11%), Zika (10%) and Hyla (1%).

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### Genetics

**GENETICS OF THE COMMERCIAL MEAT RABBIT: THE U.S. EXPERIENCE.** LUKEFAHR S.D. *Dpt. of Animal & Wildlife Sci., Texas A&M Univ.-Kingsville, Kingsville, TX 78363, USA.*

In the U.S., studies confirm that the New Zealand White breed (NZW) has proven merit for maternal traits of nest building behavior, milk production, litter size, and survival. However, the breed is inferior for certain sire traits, such as postweaning growth and carcass yield.

Hence, the commercial bred NZW can be appropriately classified as a dam breed. To date, a number of potential commercial sire breeds have been evaluated in U.S. studies: Californian (CAL), Champagne D'Argent (CHA), Flemish Giant (FG), and Palomino (PAL). According to studies, crossbred fryers sired by CAL or CHA bucks and reared by NZW dams tend to have carcasses with higher cutability compared to NZW purebred fryers, although growth performances were similar. The PAL, a breed of U.S. origin, showed that PAL purebred or crossbred fryers are comparable to NZW fryers for both growth and carcass trait performances. The FG has been noted for producing rapid gaining fryers, although carcass yield and cutability have been shown to be no better than that of the commercial NZW. Overall, these studies have demonstrated that potential sire breeds do not exist that surpass purebred NZW fryer performance for both postweaning gain and carcass yield. Therefore, in the mid-1980's, a new composite sire breed was developed that incorporated genes from CAL, CHA, and FG breeds, later named the Altex. Experimental results have shown that when Altex bucks are mated to NZW does, more rapid gains occur in crossbred fryers compared to NZW purebred fryers. A more recent genetic study has explored the potential of genetically furless rabbits for breeding in hot climates in the southern U.S. states, as well as in lesser developed countries that mostly exist in arid and tropical regions of the world.

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**GENETIC PARAMETERS OF THIGH MUSCLES VOLUME ESTIMATED IN PANNON WHITE RABBIT POPULATION USING COMPUTER TOMOGRAPHY.** NAGY I., METZGER SZ., GYOVAI M., VÍGH ZS., ROMVÁRI R., PETRÁSI ZS., SZENDRŐ ZS. *Univ. of Kaposvár, Fac. of Animal Sci. 7400 Kaposvár, Hungary.*

This presentation reviews the selection procedure of the Pannon White rabbit population at the experimental rabbit farm of the University of Kaposvár. The investigated period was 2004 - 2005. From the whole population those rabbits showing higher average daily gain than the population mean were chosen and subsequently scanned using computer tomography. Based on the computer tomography scans thigh muscles volume of the rabbits was determined. Evaluated with animal model (REML) the heritability estimates (s.e.) of the average daily gain and the thigh muscles volume were 0.20 (0.05) and 0.33 (0.05). The estimated genetic correlation coefficient (s.e.) between thigh muscles volume and average daily gain was -0,05 (0,16). Based on the size of the estimated environmental factors (applying BLUP) the year-month effect was the most important influencing factor for the average daily gain, while the thigh muscles volume was mainly affected by the body weight measured prior to the CT scanning.

### Nutrition

**EFFECT OF MATERNAL LYSINE SUPPLEMENTATION ON THE PERFORMANCE OF GROWING RABBITS (PRELIMINARY RESULTS).**

METZGER SZ.\* , DALLE ZOTTE A.† , BIRÓ-NÉMETH E.\* , RADNAI I.\* , SZENDRŐ ZS.\* *\*Univ. of Kaposvár, Fac. of Animal Sci., Kaposvár, Hungary. †Univ. of Padova, Dpt. of Animal Sci. Agripolis, Legnaro, Italy.*

The aim of this experiment was to study the effect of early lysine supplementation (at foetal and at suckling ages) on the performance of growing rabbits. Animals (n=343) get additional lysine only through their mother during the foetal and suckling ages. Half of the does (n=30) was fed control (C; Lys: 0.68%), while the other half (n=40) was fed a lysine supplemented diet (L; Lys: 0.80%) from 3 days before AI. At the 31<sup>st</sup>

day of pregnancy parturition was induced, then litters were halved. Half of the offspring of C does was put to C (CC), while the other half was put to L does (CL) and *vice versa* (LL and LC). Rabbits were weaned at 3 weeks of age (n=343). After weaning all rabbits were fed the same fattening diet (Lys: 0.68%). Lysine supplementation of the maternal diet affected significantly only the weaning weight (CC: 337, CL: 318, LC: 343 and LL: 313 g;  $P=0.001$ ). No differences were found in the other productive traits. The body weight at 11 weeks of age did not differ significantly (CC: 2574, CL: 2543, LC: 2566 and LL: 2508 g;  $P=NS$ ). Dressing out percentage of LL rabbits was 0.5% higher than that of CC, 0.8% higher than that of CL and 0.4% higher than that of LC rabbits but these differences were not significant. Protein content of hindleg meat in the LL and LC groups was 0.4% higher than in CC rabbits ( $P<0.10$ ) (CC: 20.9, CL: 21.2, LC: 21.3, LL: 21.3%). Lysine content of hindleg meat was nearly 100 mg higher in LL rabbits than in the CC group (CC: 2484, CL: 2509, LC: 2553 and LL: 2588 mg/100 g meat;  $P=NS$ ), although, the difference was not significant.

**EFFECT OF NUTRITIONAL STATUS OF KITS ON THE BODY WEIGHT AND CARCASS TRAITS.**

METZGER SZ.\* , SZENDRŐ ZS.\* , CAVANI C.† , PETRACCI M.† , GYOVAI M.\* , BIRÓ-NÉMETH E.\* , RADNAI I.\* *\*Univ. of Kaposvár, Fac. of Animal Sci., Kaposvár, Hungary. †Univ. of Bologna, Fac. of Food Sci., Cesena, Italy.*

The aim of this experiment was to study the effect of nutrition supply during foetal, suckling and growing ages on carcass traits of rabbits. New-born rabbits were divided into three groups according to their birth weight (Low/L/: 35-50g, Medium/M/:58-62g, High/H/: 70-80g). Half of the litters were nursed by one doe, while the other half by two does. After weaning at 21 days of age half of the rabbits was fed *ad libitum*, while the other half was reared on a restricted feeding regime corresponding to 80-85% of the *ad libitum* feed intake level. Rabbits were slaughtered at 11 weeks of age. Birth weight had significant influence on body weight, dressing out percentage and on the ratios of

hind part, hind legs and perirenal fat to reference carcass weight. Body weight at slaughter of L rabbits was 124 g lower than M and 255 g lower than H rabbits ( $P<0.05$ ). Group L had the highest (58.0%) while M rabbits the lowest dressing out percentage (57.3%) ( $P<0.05$ ). Ratio of hind part and hind legs was higher in group H (39.0 and 36.8, respectively) than in group L (38.1 and 35.8%, respectively) ( $P<0.05$ ). Ratio of perirenal fat was the highest in L rabbits (2.10%) and the lowest in group H (1.64%) ( $P<0.05$ ). Slaughter weight of rabbits nursed by two does was 198 g higher ( $P<0.001$ ) than that of group nursed by one doe. Chilled carcass weight and dressing out percentage were 16 g ( $P<0.01$ ) and 0.7% ( $P<0.01$ ) lower respectively, in rabbits nursed by two does. In consequence of feed restriction the slaughter weight, chilled carcass weight and dressing out percentage decreased by 141 g ( $P<0.001$ ), 22 g ( $P<0.001$ ) and 0.8% ( $P=0.001$ ), respectively, while the ratio of liver and kidneys to liveweight increased by 0.57% ( $P<0.001$ ) and 0.05% ( $P<0.001$ ), respectively. These results show that the nutrient supply during foetal and suckling ages has a long term effect which could be important in terms of carcass traits as well.

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**EFFECT OF RESTRICTED FEEDING ON PRODUCTIVE AND CARCASS TRAITS OF RABBITS.** RADNAI I., SZENDRŐ ZS., ROMVÁRI R., MATICS ZS., WOLF N. *Univ. of Kaposvár, Fac. of Animal Sci., Kaposvár, Hungary*

The aim of the study was to examine the age depended feed restriction on the productive and carcass traits of growing rabbits. Three groups of weaned rabbits (5 weeks of age) were established: AL=control group: *ad libitum* feeding during the whole fattening period (n=81), R60 group: 60% of the feed consumption of AL during the first week after weaning, 75% in the second week, 90% in the third, 100% in the fourth week and *ad libitum* afterwards (n=81), R70 group: 70% in the first, 80% in the second, 90% in the third, 100% in the fourth week and *ad libitum* till slaughtering (n=81). The daily feed intake of restricted rabbits was significantly lower between 5 and 8 weeks of age, similar between 8 and 9 weeks of age and higher

between 9 and 11 weeks of age than that of the AL group ( $P<0.001$ ) After finishing the restriction at the level of 100%, the feed consumption increased rapidly and declined afterwards. Daily weight gain of restricted groups was lower between 5 and 7 weeks of age (27.7 vs. 47.7 g/day,  $P<0.001$ ). The body weight of restricted rabbits was significantly lower till 7 weeks of age but later the difference decreased (body weight at 11 weeks, AL: 2710 g, R60: 2637 g, R70: 2655 g,  $P<0.10$ ). The feed conversion was better in the first week in AL group, while between 7 and 10 weeks of age it was better in the restricted groups ( $P<0.001$ ). Mortality was similar in each group. The feed restriction had no significant effect on carcass traits but the weight of the fore part of the carcass was higher in AL group ( $P<0.10$ ), while the liver was heavier in the restricted rabbits (84.2 vs. 80.1 g,  $P=NS$ ). The perirenal fat content was the lowest in R70 and the highest in AL group (16.9 and 21.6 g,  $P<0.05$ ), however the R60 rabbits (21.3 g) did not differ from AL group. The restricted feeding after weaning with different levels, then feeding *ad libitum* in the second part of the fattening could be advantageous.

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**FUSARIUM MYCOTOXINS IN FEEDS: THEIR EFFECT ON HEALTH STATUS, PRODUCTION AND REPRODUCTIVE TRAITS OF RABBITS. A REVIEW.** MÉZES M., WEBER M. *Szent István Univ., Fac. of Agricultural and Environmental Sci., Gödöllő, Hungary.*

Mycotoxins are secondary metabolites of moulds and cause worldwide problem in livestock, including rabbit production. Fusarium mycotoxins synthesize mainly on the field during cereal crop production at relatively high humidity and low temperature for that reason the climatic conditions of Hungary is "ideal" for them. There are only very limited information in the scientific literature about the effects of Fusarium mycotoxins in rabbit. Those main effect is to inhibit protein synthesis – trichotecene mycotoxins; sphingolipid biosynthesis– fumonisins and have estrogenic effect– zearalenone. Clinical signs of mycotoxicosis are often remains unclear

because of the immunosuppressive effect of some *Fusarium* mycotoxins, mainly trichothecenes, which may cause decreased resistance to infectious diseases. The paper discuss about the clinical and pathological effects of trichothecenes – T-2 toxin, HT-2 toxin, DON – fumonisins and zearalenone also about their effect on production and reproduction of rabbits.

### Reproduction

**EFFECT OF REARING METHOD ON FEED INTAKE AND BODY WEIGHT OF RABBIT DOES.** GYÓVAI M., BIRÓ-NÉMETH E., RADNAI I., GERENCSÉR ZS., PRINCZ Z., SZENDRŐ ZS. *Univ. of Kaposvár, Fac. of Animal Sci., Kaposvár, Hungary.*

The aim of the study was to examine the effect of birth weight (35-45, 53-58 and 65-70g), milk supply (nursing by one or two does) and feeding regime (*ad libitum* or restricted feeding (80-85% of *ad libitum*) on feed intake and body weight of does. The body weight of 328 Pannon White does was measured 4 days before the first insemination (AI), at the day of the first AI and at the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> and the 4<sup>th</sup> parturition. The feed intake was measured during flushing (4 days before the first AI), during the first pregnancy and during the first 4 lactations till the day 17. The feed intake of does was not affected by the birth weight but significant difference was found in the body weight between does of small and large birth weight. Number of nursing does had significant effect on feed intake during the first pregnancy and the second lactation. The feed consumption during flushing and first pregnancy was higher in does nursed by one doe but between the 1<sup>st</sup> and 4<sup>th</sup> lactations the feed consumption of does nursed by two does was higher. The body weight of does nursed by two does was significantly higher than that of does nursed by one doe. The feeding regime had significant effect on feed intake during flushing and the 4<sup>th</sup> lactation, but generally the restricted group consumed more pellet. At the day of the first AI the *ad lib.* fed group had 250g higher body weight, but at the first kindling and later the

weight of restricted group was higher. In respect of body weight and the condition of does it seemed to be advantageous to nurse them by two does and fed restrictively from weaning till flushing before the first insemination.

**FOLLOWING THE SEXUAL MATURITY OF GROWING RABBITS AS A FUNCTION OF THE FEED INTENSITY, BODY COMPOSITION, GENOTYPE AND TWO DIFFERENT HORMONAL TREATMENTS.** FODOR K.\*, ZÖLDÁG L.\*, KULCSÁR M.\*, ANDRÁSOSZKY E.\*, GLÁVITS R.†, BERSÉNYI A.\*, FEKETE S.\* *Szent István Univ., Fac. of Veterinary Sci., Budapest, Hungary.* †Hungarian Inst. of Animal Health, Budapest, Hungary.

In this study the development of the sexual maturity in two rabbit genotypes (New Zealand White: early sexual maturity, /n=46/ and Hungarian Giant: late sexual maturity /n=48/) was followed, applying two feeding regimes (*ad libitum* or restricted to 70% of *ad libitum*) and using two types of hormonal treatments (GnRH or HCG). The feed restriction to 70% of *ad libitum* is too strict for breeding rabbits, thus, independently of breed or sex it is not suggested. The decreased reproductive performance of does was the consequence of lower body fat content, while that of bucks (through the decreased libido) was the result of stress caused by the feed restriction. In sexually matured does the inclination for mating was higher in HCG treated group, thus, the probability of pregnancy was also higher in these does compared to GnRH treated animals, however, the ovulation inducing effect of the latter hormone is more expressed.

**CHANGING OF NURSING METHOD AS BIOSTIMULATION: EFFECT OF DOE-LITTER CONTACT.** EIBEN Cs.\*, TÖBIÁS G.\*, KUSTOS K.†, GÓDOR S-NÉ\*, KOTÁNY Sz.\*, GULYÁS B.\*, SZIRA G.‡ *Inst. for Small Animal Res., Gödöllő, Hungary.* †Lab-Nyúl Ltd, Gödöllő, Hungary. ‡Szent István Univ., Fac. of Agricultural and Environmental Sci., Páter K. Gödöllő, Hungary.

Multiparous Pannon White does (n=400) were divided into five groups. Does in control group (C) nursed freely during the whole lactation period (until 35 days of age). In the other control

group (1X) kits were nursed once a day (between 8:00-9:00 am) until 14 days, then, nursed freely afterwards. In D, F and E groups, nest boxes were closed at day 8 (at 9:00 am), and they were opened only for one hour (between 8:00-9:00 am) between 9 and 11 days. Does were inseminated within 15-30 min after controlled nursing (except group C) at day 11 PP in the morning. Then, D, F and E groups could also nurse freely afterwards. These groups differed only in the way of dam-litter separation: controlled suckling was performed by wire-net separation in group D (permits visual, olfactory, and acoustic contact), by metal plate insertion in group F (no visual but possible olfactory, acoustic and vibration contact) or by removing nest boxes with kits at least 5m far from the does in group E (there is no contact at all). In C, 1X, D, F and E groups the sexual receptivity (28, 47, 26, 26, 42%;  $P=0.009$ ), fertility (74, 84, 81, 80, 89%;  $P=0.05$ ) and kindling rate (71, 85, 77, 77, 88%;  $P=0.05$ ) differed significantly, while the treatments had no influence on the number of born alive (9.2, 9.6, 9.6, 9.8, 9.0;  $P=0.607$ ).

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**EFFECT OF LIGHTING PROGRAM AND BIOSTIMULATION ON PERFORMANCE OF RABBIT DOES. 1. CONTINUOUS AND INTERMITTENT LIGHTING.** SZENDRŐ ZS., MATICS ZS., GERENCSÉR ZS., GYOVAI M., BIRÓ-NÉMETH E., RADNAI I. *Univ. of Kaposvár, Fac. of Animal Sci. Kaposvár, Hungary.*

Pannon White rabbit does (n=113) were housed in two identical rooms. They were mated first at the age of 16.5 weeks and reinseminated 11 d after parturition. In one of the rooms the lighting period was 16 hours light and 8 hours dark (16L:8D), while in the other one a 8L:4D:8L:4D intermitted lighting program was applied. In both rooms half of the does nursed their kits freely, while the other half nursed freely from birth till 3d before AI, then controlled nursing was applied during the next 3 days till AI (biostimulation), then nursed freely again afterwards. The lighting program had no any effect on reproductive traits (conception rate, litter size total, alive and at 21 d, litter- and individual weight at 21 d and suckling mortality).

According to the preliminary results, the number of daily nursing events were higher in the 8L:4D:8L:4D group but it had no effect on the milk production (litter- and individual weight at 21 d).

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**EFFECT OF LIGHTING AND BIOSTIMULATION ON PERFORMANCE OF RABBIT DOES. 2. EFFECT OF NURSING METHOD.** SZENDRŐ ZS., MATICS ZS., GERENCSÉR ZS., GYOVAI M., BIRÓ-NÉMETH E., RADNAI I. *Univ. of Kaposvár, Fac. of Animal Sci. Kaposvár, Hungary. pohnl@mail.atk.u-kaposvar.hu*

Pannon White does (n=113) were housed in two identical rooms at 11 weeks of age. They were mated first at 16 weeks of age. In one of the rooms 16 hours light and 8 hours dark (16L:8D), while in the other one 8L:4D:8L:4D was applied. In both rooms half of the does nursed they kits freely (NOBIOS). The other half nursed freely till 3 d before AI, then, controlled nursing was applied during the next 3 days (till AI), then, nursed freely again afterwards (BIOS). In this paper the effect of nursing method is summarized. The conception rate differed significantly (BIOS: 80.6%; NOBIOS: 71.9%). Examining the litter size of does which became pregnant after the first AI at 11 d after parturition, some differences were detected. The effect of biostimulation was not significant on litter size total and alive, although better results were found in BIOS group (8.62 and 8.15, resp.) than in NOBIOS group (8.30 and 7.84, respectively). Biostimulation had a negative effect on litter- and individual weight at 21 d (respectively, BIOS: 2.89 kg and 376 g, NOBIOS: 3.08 kg and 396 g,  $P<0.05$ ). The mortality of kits till 21 d was similar (BIOS: 7.4%, NOBIOS: 4.5%). The positive effect of biostimulation was proved when the performance was calculated on the basis of one insemination: the litter size total (BIOS: 6.95, NOBIOS: 5.97%), alive (BIOS: 6.24, NOBIOS: 5.67), litter weight at 21d (BIOS: 2.33 kg, NOBIOS: 2.21 kg) per insemination were higher in BIOS group. The productivity of BIOS group was 5-16% higher than the NOBIOS does.

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### Housing and behaviour

#### EXAMINATION ON FREE CHOICE OF RABBITS BETWEEN WIRE NET AND DEEP LITTER FLOOR.

OROVA Z., SZENDRŐ ZS., RADNAI I., BIRÓNÉ-NÉMETH E. *Univ. of Kaposvár, Fac. of Animal Sci. Kaposvár, Hungary.*

The free choice of rabbits between deep litter and wire net floor was investigated. The floor of the 2.89 m<sup>2</sup> pens was divided into two parts; one part was wire net, while the other part was covered with deep litter. Twenty-three, 35 or 46 rabbits, weaned at the age of 5 weeks were placed into one pen (8, 12 and 16 rabbits/m<sup>2</sup>, respectively). A 24-hour video recording was performed every week; the number of rabbits on deep litter or on wire net was counted every half-hour. During the whole experimental period (between 5 and 10 weeks of age) 18, 14 and 14% of all rabbits stayed on the deep litter, depending on the number of rabbits in one pen (23, 35 or 46, respectively). The feed intake was lower in the feeders placed in the deep litter (28, 18 and 16% of the whole feed intake, respectively). According to the results, at normal temperature (16-18°C) rabbits prefer wire net floor, compared to deep litter.

#### FREE CHOICE OF RABBITS AMONG CAGES WITH DIFFERENT HEIGHT.

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The aim of the experiments was to examine the preference of kits depending on the cage height. Pannon White rabbits (n=112) were housed into cage-blocks (2 m<sup>2</sup>) with the stocking densities of 16 or 12 rabbits/m<sup>2</sup> (experiment 1 and 2). Each block was divided into 4 cages (0.5 m<sup>2</sup>) with swing doors between them (free moving). The only difference in the cages was their height: 20, 30, 40 cm and open-top. Once a week a 24-hour video observation was done by infra-red cameras. Every half-hour rabbits were counted in each cage. During the second experiment the feed consumption per cage was also measured. In both experiments during the whole observation period (between weeks 5 and 10) the fewest rabbits were observed in the open-

top part, only 15.9-16.5% of the rabbits stayed there. During the first week of observation (5-6 weeks of age) rabbits liked huddle together so that week was inadequate for examining the preference of kits. However, there was not any week when rabbits preferred the open-top cage instead of those covered by wire net. In the 1<sup>st</sup> experiment (16 rabbits/m<sup>2</sup>) during active period some more rabbits were in the higher cages and less in the lower ones (20 cm), but during the resting period the lowest cages (20 cm) were visited the most frequently. (The differences among cages with 20, 30 and 40 cm were not significant.). It could be in connection with the behaviour of wild rabbits, they feel secure in the narrow hole and afraid of being outside of the cavity (fear of predators). The conclusion is that fattening cages with 30-35 cm height are not against the welfare and wellbeing of growing rabbits.

#### EFFECT OF DIFFERENT HOUSING ON PRODUCTIVE TRAITS AND ON SOME BEHAVIOUR PATTERNS OF GROWING RABBITS.

PRINCZ Z., SZENDRŐ ZS., DALLE ZOTTE A., RADNAI I., BIRÓNÉ-NÉMETH E., METZGER Sz., GYOVAI M., OROVA Z. *Univ. of Kaposvár, Fac. of Animal Sci. Kaposvár, Hungary. †Univ. of Padova, Dpt. of Animal Sci., Agripolis, Legnaro, Italy.*

Twohundred-twenty-eight 5-week-old Pannon White rabbits were housed in cages (2 rabbits/cage, 0.12 m<sup>2</sup>) or in pens (13 rabbits/pen, 0.83 m<sup>2</sup>) with the same stocking density (16 rabbits/m<sup>2</sup>). In half of the cages and pens the floor was wire net while in the other half plastic net. In every second cage and pen wooden gnawing stick was fixed onto the wall. Every second week a 24-hour video recording was done to examine the gnawing stick consumption. At the end of the experiment (11 weeks of age) the injuries on ears were checked when rabbits were slaughtered. The daily weight gain between 5 and 7 weeks of age was significantly higher in cage housed rabbits than in pens housed ones. Later, the weight gain became similar in both groups but the body weight of rabbits in cages was significantly higher between 7 and 11 weeks of age. The floor type had no significant effect

on weight gain and body weight. Rabbits in cages/pens with gnawing stick were significantly heavier at 11 weeks of age. The rabbits in cages consumed significantly more pellet between 6 and 8 weeks of age. The feed conversion was significantly better in cages between 5 and 7 weeks of age and also during the whole fattening period compared to pens. The floor type and wooden stick had no effect on feed intake and feed conversion. The mortality was independent of all treatments. The group size (cage vs. pen) had no effect on any slaughter trait. Rabbits reared on plastic net had significantly higher fore part percentage of the carcass than rabbits reared on wire net. Gnawing stick had a positive effect on dressing out percentage ( $P<0.05$ ), however only the fore part of the carcass was larger significantly. The perineal fat content in rabbits consumed wooden stick was significantly higher. The gnawing stick consumption was significantly higher in pens compared to cages. The injuries on ears were more frequent (about double) in rabbits housed in pens or on plastic net, however, significant difference was found only between rabbits with or without wooden stick (1.2 vs. 14.7%,  $P<0.001$ ).

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**EFFECT OF FLOOR TYPE AND STOCKING DENSITY ON PERFORMANCE OF GROWING RABBITS.** PRINCZ Z., SZENDRŐ ZS., RADNAI I., BIRÓ-NÉMETH E., OROVA Z., MATICS ZS., GYOVAI M. *Univ. of Kaposvár, Fac. of Animal Sci. Kaposvár, Hungary.*

Five-week-old Pannon White rabbits (n=120) were housed in pens (0.82 m<sup>2</sup>). Four groups were established according to the floor type. Deep litter (straw) was put into the pens in different times after weaning: 6W: wire net during the whole (5-11 weeks) fattening period; 6D=deep litter during the whole fattening period; 4W2D=wire net between weeks 5 and 9 and deep litter between weeks 9 and 11; 2W4D=wire net between weeks 5 and 7 and deep litter between weeks 7 and 11. The number of kits per pen was 13, 10 or 7 with the stocking density of 16, 12 or 8 rabbits/m<sup>2</sup>. They were fed a commercial pellet *ad libitum* with medication after weaning and

without it during the second period of fattening. The aim of the experiment was to study the effect of floor type (deep litter) and stocking density on the performance of kits. The time of putting the deep litter into the pens affected the weight gain, body weight, feed intake and feed conversion. In groups 4W2D and 2W4D the feed consumption and the weight gain decreased after placing the straw litter into the pen. The mortality was similar, except in the last week of fattening. The stocking density had a significant effect on feed intake and weight gain in some weeks, with higher intake and growth of group 8 rabbits/m<sup>2</sup> compared to 16 rabbits/m<sup>2</sup>. But body weight, feed conversion and mortality were not influenced by the stocking density. Housing rabbits on wire net after weaning and rearing them on deep litter during the second part of fattening could be a good compromise to prevent enteritis (coccidiosis) and in term of animal welfare as well. However, due to the usage of medicated pellet in the first part of fattening, it is impossible to prove the positive effect of floor type on mortality in this period. Since stocking density had a very weak effect on productive traits, housing rabbits in small group in pen could be beneficial.

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### Pathology

**PREVALENCE AND GENETIC DIVERSITY OF *PASTEURELLA MULTOCIDA* AT A GROUP OF UNIPAROUS FEMALE RABBITS WITH SUBCUTANEOUS ABCESS.** VIRAG GY.\*, MOHAUPT M.†, A. MOLNAR A.†, TEREYI Z.†, SIPOS L.†, ODERMATT M.† *\*Inst. for Small Animal Res. Gödöllő, Hungary. †OliviA Ltd., Lajosmizse, Hungary.*

The prevalence of *Pasteurella multocida* nasal carrier (n.c.) state was investigated and performance traits of females and fatteners were compared at group of *P. multocida* carriers and non-carriers, respectively. Genetic characterization of isolates was performed by REP-PCR. At least one *P. multocida* positive swab was collected from 45,5% of females. Number of n.c. broilers were 12/46 vs. 13/38 within progenies raised by n.c. or non-n.c. does, respectively. Body weight of broilers at 6 weeks of age was 833 vs. 917 g for those raised up by

n.c. or non n.c. females, respectively. Daily weight gain at the finishing periode was 33 vs. 29 g for n.c. or non n.c. broilers, respectively. Based on the DNA pattern generated by the REP-

PCR reaction the *P. multocida* isolates grouped into 3 main clusters with a cutoff at 80% similarity. Each clusters included strains collected at each level of the study.

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