

---

**Abstracts of the “19<sup>TH</sup> HUNGARY CONFERENCE ON RABBIT PRODUCTION”****Kaposvár, Hungary. May 23, 2007**

---

About 100 participants took part on the 19th Hungarian Conference on Rabbit Production in Kaposvár. It was organized by the University of Kaposvár, the Hungarian Branch of the WRSA, the Rabbit Production Board and the Agribrand Europe Hungary Rt. This is the largest and most popular events of the rabbit breeders in Hungary. 16 papers were presented by scientists and PhD students. All of the abstracts are published in the WRS. The topic of the papers covered all field of rabbit production (production nutrition, selection, behaviour and welfare). Some of the full papers are available on [www.atk.u-kaposvar.hu/sertes/nyulasnapok.htm](http://www.atk.u-kaposvar.hu/sertes/nyulasnapok.htm) in Hungarian but the abstracts and the text of tables and figures are written in English as well.

---

**Production**

**SITUATION OF RABBIT PRODUCTION IN HUNGARY IN 2006.** KLING J. *Rabbit Prod. Board, Budapest, Hungary. [bacskart@artnet.hu](mailto:bacskart@artnet.hu)*

In 2006, the total quantity of the Hungarian rabbit production was 12,979 tons in live and 5,292 tons of carcass. The production level in 2006 was the same as it was in 2005 (5,310 tons of carcass). The amount of carcass (fresh) exported to Italy, Switzerland, Germany and Belgium was 2,340; 1,165; 534 and 202 tons, respectively. The proportion of rabbits produced in small or large farms was 10 and 90%, respectively. The price of live rabbits (paid by the slaughter houses) was about 350 Ft/kg (1.4 Euro/kg). The ratio of the export was 96-97% so the home consumption (sell by supermarkets etc.) was only 3-4%.

---

**WHAT IS OUR FUTURE?** McNITT J.I. *Southern Univ. Agricultural Research and Extension Center, [james\\_mcnitt@suagcenter.com](mailto:james_mcnitt@suagcenter.com)*

Livestock production is moving from the Era of Intensification to the Quality of Life Agricultural Era. In the former era it was assumed that efficiency is attained by specialization, simplification and concentration, that therapeutic intervention can control disease,

that innovation will always be able to overcome production problems, and that cheap energy will always be available. In this era, the scientists and the businessmen were the knowledge keepers who identified the wishes of the public and designed and carried out programs to provide society with what it demanded. In the Quality of Life Agricultural Era, the emphasis is on energy conservation, self renewal and self regulation, knowledge intensive production and stresses optimum rather than maximum production. If the rabbit scientists, extension personnel and farmers are to be the knowledge keepers in the new era, they must be attuned to and act on the wishes of the public. This also includes the small producers who, in many areas, own the majority of breeding animals and are the most numerous growers. Focusing research and outreach activities on these small growers is difficult because of the sheer number, the variety of breeding and management systems used and the widely varying needs. Development of size neutral research programs will, to some extent, overcome these problems. In addition, scientists are hampered by difficulties in obtaining funding for small farm research, finding publication outlets and gaining recognition for promotion.

---

## Nutrition

**GROWTH AND CARCASS TRAITS OF RABBITS AS AFFECTED BY DIETARY SUNFLOWER OIL AND LINSEED OIL AND DIFFERENT VITAMIN E ADDITIONS.** EIBEN Cs.<sup>1</sup>, GÓDOR S-NÉ<sup>1</sup>, VÉGI B.<sup>1</sup>, VIRÁG GY.<sup>1</sup>, FÉBEL H.<sup>2</sup>, ZSÉDELY E.<sup>3</sup>, TÓTH T.<sup>3</sup>, SCHMIDT J.<sup>3</sup>, <sup>1</sup>Res. Inst. Anim. Breed. and Nutr., Div. of Small Anim. Prod., Gödöllő.; <sup>2</sup>Res. Inst. Anim. Breed. and Nutr., Herceghalom; <sup>3</sup>Univ. West Hungary, Mosonmagyaróvár, eiben@katki.hu

This work studied the effect of oil addition and that of the source and level of vitamin E dietary supplementation on growth and carcass traits of NZW rabbits (n=300) fed the experimental diets from 21 to 84 days of age. The negative control group (NC) was fed a low energy diet (10.6 MJ/kg DE) without oil addition and with 60 mg/kg of synthetic vitamin E (dl- $\alpha$ -tocopherol-acetate). The positive control group (PC) received a higher energy diet (11.4 MJ/kg DE) with 2% of sunflower oil and 2% of linseed oil and with 60 mg/kg of synthetic vitamin E. In 150-ES and 300-ES groups the level of synthetic vitamin E was increased to 150 or 300 mg/kg feed, respectively. In 90-EN and 240-EN groups 60 mg/kg of synthetic plus 90 or 240 mg/kg of natural vitamin E (a fatty acid distillate, i.e. d- $\alpha$ -tocopherol) addition was used to reach the vitamin E doses of 150 or 300 mg/kg feed, respectively. Except NC group, the energy and oil contents of the diets were similar in each group. During pre-feeding (21-35 d), the feed intake in 240-EN group was lower (627, 604, 596, 584, 607, 523 g,  $P=0.001$  in NC, PC, 150-ES, 300-ES, 90-EN, 240-EN groups, respectively) and females lost more weight (-71, -152, -93, -222, -222, -250 g,  $P=0.025$ , resp.). Kits' mortality was higher (3.16, 3.45, 1.28, 3.16, 5.75, 9.37%,  $P=0.051$ , resp.) and litter weight at weaning (35 d) tended to be lower in 240-EN group (7004, 7060, 6983, 6881, 6835, 6079 g,  $P=0.097$ , resp.). The 240-EN kits had lower 35 d body weight than NC and 150-ES rabbits (914, 886, 892, 887, 883, 863 g,  $P=0.011$ , resp.) but they compensated their weight up to 84 days of age (2594, 2655, 2688, 2745, 2687, 2733 g,  $P=0.049$ , resp.) due to their better weight gain (34.9, 36.1, 36.8, 38.0, 36.8, 37.7 g/d,  $P=0.045$ , resp.) and feed conversion

(3.25, 3.12, 3.03, 3.05, 3.05, 3.02, resp.) compared to NC rabbits. Comparing to the PC group, it seems that higher doses and natural sources of vitamin E addition reduced ( $P>0.05$ ) the 35-84 d sanitary risk (27.1, 43.5, 37.5, 34.0, 31.9, 30.6%, resp.). Chilled carcass weight (1645, 1690, 1680, 1652, 1645, 1661 g,  $P=0.001$ , resp.) and dressing out percentage (63.1, 64.9, 64.4, 63.4, 63.1, 63.7,  $P=0.001$ , resp.) were higher in PC and 150-ES, intermediate in 240-EN and lower in other rabbits. The perirenal fat weight was lower in 300-ES rabbits (17.9, 23.1, 24.9, 15.2, 20.9, 23.2 g,  $P=0.001$ , resp.).

**EFFECT OF VEGETABLE OIL SUPPLEMENTATION AND DIFFERENT VITAMIN E SOURCES ON THE PH AND COLOUR OF RABBIT HIND LIMB (SZERINTEM HIND LEG!) MEAT.** VIRÁG GY.<sup>2</sup>, GÓDOR S-NÉ<sup>2</sup>, VÉGI B.<sup>2</sup>, EIBEN Cs.<sup>2</sup>, FÉBEL, H.<sup>3</sup>, ZSÉDELY E.<sup>1</sup>, TÓTH T.<sup>1</sup>, SCHMIDT J.<sup>1</sup> <sup>1</sup>Univ. West Hungary, Mosonmagyaróvár; <sup>2</sup>Res. Inst. Anim. Breed. and Nutr., Div. of Small Anim. Prod., Gödöllő; <sup>3</sup>Res. Inst. Anim. Breed. and Nutr., Herceghalom; virag@katki.hu

A trial was carried out to determine the effect of vegetable oil supplementation and different vitamin E sources on the pH and colour of rabbit hind leg meat (N=15/treatment). The negative control (*group 1*) was fed a low energy diet. The animals of the *group 2 to 6* received a compound feed supplemented with 2% of sunflower oil and 2% of linseed oil. Natural vitamin E (a by-product of the oil industry, i.e. *fatty acid distillate*) or synthetic dl- $\alpha$ -tocopherol-acetate were used as vitamin E sources. The content of the synthetic dl- $\alpha$ -tocopherol-acetate was 60 mg/kg feed (*group 1* and *2*), which was increased up to 150 or 300 mg/kg with synthetic (*group 3* and *4*) or natural (*group 5* and *6*)  $\alpha$ -tocopherol. Supplementing the diet with sunflower and linseed oil significantly decreased the  $b^*$  and  $C^*$  values. Both the synthetic and the natural  $\alpha$ -tocopherol supplementation decreased  $a^*$  and increased  $H^o$  values. The pH was not affected by treatments.

**EFFECT OF SUNFLOWER OIL AND LINSEED OIL AND DIFFERENT VITAMIN E SOURCES ON THE VITAMIN E CONTENT AND OXIDATIVE STABILITY OF RABBIT MEAT.** ZSÉDELY E.<sup>1</sup>, TÓTH T.<sup>1</sup>, EIBEN CS.<sup>2</sup>, GÓDOR S.-NÉ<sup>2</sup>, VÉGI B.<sup>2</sup>, VIRÁG GY.<sup>2</sup>, FÉBEL, H.<sup>3</sup> SCHMIDT J.<sup>1</sup>. <sup>1</sup>Univ. West Hungary, Mosonmagyaróvár; <sup>2</sup>Res. Inst. Anim. Breed. and Nutr., Div. of Small Anim. Prod., Gödöllő; <sup>3</sup>Res. Inst. Anim. Breed. and Nutr., Herceghalom; zsedelye@mtk.nyme.hu

A trial was carried out to determine the effects of different dietary vitamin E additions on the fatty acid profile, vitamin E content and oxidative stability of the rabbit meat. Fifty New Zealand white rabbits per treatment (n=300) were fed the experimental diets between 35 and 84 days of age. Natural vitamin E (a by-product of the oil industry, i.e. fatty acid distillate, d- $\alpha$ -tocopherol) or synthetic dl- $\alpha$ -tocopherol-acetate was used as vitamin E sources. The content of the synthetic dl- $\alpha$ -tocopherol-acetate was 60 mg/kg feed (group 1 and 2), which was increased up to 150 or 300 mg/kg of vitamin E level with synthetic (group 3 and 4) or with natural form (group 5 and 6). The negative control (group 1) was fed a low energy diet without oil addition (10.61 MJ/kg DE). The animals in groups 2 to 6 received a compound feed supplemented with 2% of sunflower oil and 2% of linseed oil (11.36 MJ/kg DE). The oil addition significantly increased the UFA- and the PUFA-, while decreased the SFA- and MUFA content in hind leg muscle compared to the negative control group. The n-6/n-3 PUFA ratio was lower (in group 1 to 6: 4.28, 2.43, 2.23, 2.16, 2.41, 2.75, respectively) and the PUFA/SFA ratio was significantly ( $P<0.05$ ) higher (0.72, 1.98, 1.87, 1.99, 2.06, 1.98, respectively) in the experimental groups compared to group 1. It was also found that supplementing the diet with synthetic dl- $\alpha$ -tocopherol-acetate (groups 3 and 4) or with natural d- $\alpha$ -tocopherol (groups 5 and 6) the vitamin E content of hind leg meat increased significantly (48.66 and 58.82 vs. 85.00, 143.16, 80.21, 144.93 mg/kg feed, in groups 1 and 2 vs. groups 3 to 6, respectively) and the oxidative stability of the rabbit meat improved compared to the negative and positive control groups (group 1 and 2).

**EFFECT OF A ROSMARY EXTRACT ON SOME PRODUCTION TRAITS OF EARLY WEANED GROWING RABBITS.** ERDÉLYI M.<sup>1</sup>, EIBEN CS.<sup>2</sup>, KUSTOS K.<sup>1</sup>, GÓDOR S.-NÉ<sup>2</sup>, HEGYI K.<sup>1</sup>, MÉZES M.<sup>1</sup>, <sup>1</sup>Szent István Univ., Fac. Agricultural and Environmental Sci., Gödöllő; <sup>2</sup>Res. Inst. Anim. Breed. and Nutr., Div. of Small Anim. Prod., Gödöllő; erdelyi.marta@mkk.szie.hu

The authors studied the efficiency of rosemary extract on the daily weight gain, feed intake and feed conversion of young growing rabbits weaned at 23 days of age. Rabbits were fed standard medication-free diet supplemented with the herb extract dissolved in sunflower oil. Daily weight gain and feed intake were measured fortnightly (at 3, 5, 7, 9 and 11 weeks of age) and feed conversion was calculated. Parameters of pH, drip loss and dry matter of meat samples was planned to be describe the meat quality. Rosemary extract seems to have a positive effect in the first 2-3 weeks after weaning on the feed intake and daily weight gain, however differences were not significant. Rosemary extract had a positive influence on meat quality since the stability of pH was significantly better and the taste of the boiled meat was found to be more delicious compared to the control group. Considering our results, rosemary extract might be a reasonable alternative to AGP-s, but further and large-scale experiments are necessary to confirm our findings.

---

### Animal model

**USE OF RABBIT AS ANIMAL MODEL OF ATHEROSCLEROTIC DISEASE.** LŐRINCZ B.<sup>1</sup>, VARGA S.<sup>2</sup>, PETRÁSI Zs.<sup>1</sup>, PETNEHÁZY Ö.<sup>1</sup>, GARAMVÖLGYI R.<sup>1</sup>, TAKÁCS I.<sup>1</sup>, SZABÓ G.<sup>1</sup>, LUKÁCS G.<sup>3</sup>, BOGNER P.<sup>3</sup>, REPA I.<sup>3</sup>, GYARMATI J.<sup>4</sup>, VAJDA Zs.<sup>3</sup>, <sup>1</sup>Univ. Kaposvár, Inst. of Diagnostic Imaging and Radiation Oncology, Kaposvár; <sup>2</sup>Univ. Debrecen Medical and Health Sci. Center, Debrecen; <sup>3</sup>Univ. Kaposvár Health Sci. Center, Kaposvár; <sup>4</sup>Huniko Ltd., Miskolc..

Atherosclerosis is the leading cause of morbidity and mortality in the modern human population. Percutaneous intravascular interventions using balloon-angioplasty and stent insertion are safe and effective methods to treat narrowed arterial

segments in cerebral, coronary and peripheral arteries. Restenosis of the treated arterial segment, due to formation of neointimal tissue on the stent struts is a major drawback of the procedure. Extensive research is aimed on the prevention of in-stent restenosis, requiring reliable, but economically feasible animal models of neointima formation. The purpose of our study was the establishment of an experimental rabbit model of in-stent neointimal formation. Pannon White rabbits were fed diets with two different levels of cholesterol (2% cholesterol-4% cocoa butter; 1,5% cholesterol-3% cocoa butter) for 2 weeks, followed by stent insertion into the right external iliac artery. High cholesterol diet was continued for 6 additional weeks, serum levels of cholesterol and triglyceride were determined at the beginning of the protocol and two weeks later. Histological analysis of the stented segments 6 weeks after the stent insertion revealed 35-36% narrowing of the stented arterial segment. In conclusion, our rabbit animal model is a reproducible experimental tool for the study of in-stent neointimal formation.

### Selection

**EFFECT OF CT BASED DIVERGENT SELECTION FOR TWO GENERATIONS ON LIPID PEROXIDE AND GLUTATHIONE REDOX STATUS OF SOME TISSUES OF GROWING RABBITS.** BALOGH K.<sup>1,3</sup>, METZGER SZ.<sup>2</sup>, FRICSKA M.<sup>3</sup>, ROMVÁRI R.<sup>2</sup>, SZABÓ A.<sup>2</sup>, LOCSMÁNDI L.<sup>2</sup>, MÉZES M.<sup>3</sup>, ERDÉLYI M.<sup>3</sup>, SZENDRŐ ZS.<sup>2</sup>, <sup>1</sup>MTA-KE Res. Group of Anim. Breed. and Hygiene, Univ. Kaposvár Fac. Anim. Sci., Kaposvár; <sup>2</sup>Univ. Kaposvár, Fac. Anim. Sci., Kaposvár; <sup>3</sup>Szent István Univ., Dpt. of Anim. Nutr., Gödöllő; Mezes.Miklos@mkk.szie.hu

The effect of divergent selection for higher and lower dressing out percentage by CT method on the lipid peroxide status measured by the content of malondialdehyde, as well as on the glutathione redox system measured by the amount of reduced glutathione and activity of glutathione peroxidase activity in different tissues (blood plasma red blood cell haemolysates, kidney, liver, heart, *m. longissimus dorsi* and hind leg muscle homogenate) was investigated in Pannon white male rabbits. The

results suggest that selection oriented to improving the dressing out percentage for two generations, affects both the glutathione redox and lipid peroxide status of the tissues as a genetic effect. The most marked differences were found in blood plasma, kidney and heart but contrary to our previous findings not in the muscles. It suggests that the actual nutrient supply and environmental factors have more pronounced effect on the lipid peroxide and glutathione redox state than genetic effects.

**EFFECT OF SELECTION ON INBREEDING AND SELECTION RESPONSE IN PANNON WHITE RABBITS.** GYOVAI P., NAGY I., GERENCSÉR ZS., METZGER SZ., BIRÓNÉ N. E., RADNAI I., BOKOR Á., VÍGH ZS., SZENDRŐ ZS., Univ. Kaposvár Fac. Anim. Sci., Kaposvár; Nagy@mail.atk.u-kaposvar.hu

Growth traits and pedigree data were analyzed in a group of 15208 Pannon White rabbits born between 2003 (December) and 2006 (August) and reared in 2426 litters. In the present study inbreeding coefficients, pedigree completeness (complete generation equivalents), genetic parameters, genetic trends and inbreeding depression were estimated. Estimated heritabilities were moderate for average daily gain and thigh muscle volume (0.21-0.22±0.02; 0.28-0.29±0.03, respectively). Litter effects were moderate and low (0.21-0.22±0.01-0.02; 0.10±0.01-0.02, respectively). Genetic correlation coefficient estimates between average daily gain and thigh muscle volume were moderate (0.26-0.28±0.07-0.8). Majority (98%) of the population was inbred which can be explained by the closed population structure and by the long and complete pedigrees (average pedigree completeness of the population was 10.91). The average level of inbreeding on the other hand was only 5.56%. Annual rate of inbreeding was cca 0.5% but in 2006 it increased to 0.8%. Consequently the effective population size was only 52 in 2006. The estimated selection response was low for both traits (0.052 g/year-season for average daily gain; 0.366 cm<sup>3</sup>/year-season for thigh muscle volume). Omitting the inbreeding coefficients from the model resulted 25-40% over prediction of the selection responses. The

models containing the inbreeding coefficients showed (although minimally) better fit. During the analyzed period additive genetic variance did not decrease in either trait.

### Reproduction

**EFFECTS OF RESTRICTED FEEDING AND AGE AT FIRST INSEMINATION ON REPRODUCTIVE TRAITS OF RABBIT DOES.** SZENDRŐ Zs., BIRÓNÉ NÉMETH E., MATICS Zs., GYOVAI P., NAGY I., *Univ. Kaposvár. Pohnl@mail.atk.u-kaposvar.hu*

Effects of feed restriction and age at first AI on the reproductive performance of rabbit does were examined. Half of the Pannon White (PW n=78) and of the Giant size (LB n=96) does were fed *ad libitum* and inseminated at the age of 15.5 weeks (AD15, n84). The remaining does were fed 130 g/day pellet from the age of 11 weeks till 8 days prior to insemination and they were inseminated at the age of 19.5 weeks (RES19, n=87). After the first insemination the LB-AD15 group showed significantly lower conception rate (69.4%) than the does from the other group (84.7%). Mortality of the kits in the first parity of the AD15 does was significantly higher than that of the kits of the RES19 does (22.5% vs. 17.8%) or that of the kits born in latter parities regardless of the does' group (pooled average of the groups was 11.3%). The other traits (number of kits born alive, total number of kits born, litter size at 21d, litter and individual weight at 21d) was not significantly affected by the rearing method or by the age at first AI. Number of kits born alive per 100 inseminations was higher in the RES19 group in both genotypes (PW, LB). It can be concluded that inseminating giant size does at the age of 15.5 weeks is not advisable even feed them *ad libitum*. Regardless of the does' genotype feeding restriction during rearing and insemination at a latter age is advantageous.

**EFFECT OF CROSSBREEDING ON REPRODUCTIVE PERFORMANCE IN RABBITS.** SZENDRŐ Zs.<sup>1</sup>, KUSTOS K.<sup>2</sup>, JUHÁSZ Zs.<sup>2</sup>, RADNAI I.<sup>1</sup>, BIRÓ-NÉMETH E.<sup>1</sup>, PRINCZ Z.<sup>1</sup>, MATICS Zs.<sup>1</sup>, GYOVAI P.<sup>1</sup>, NAGY I.<sup>1</sup>, <sup>1</sup>Univ. Kaposvár; <sup>2</sup>Lab-Nyúl Ltd., Gödöllő; Pohnl@mail.atk.u-kaposvar.hu

A crossbreeding experiment was carried out to evaluate the reproductive performance of purebred and crossbred rabbit does. Data of purebred Pannon White (PW, 195 litters), Maternal line (ML, 155 litters) and that of their diallel crossbred does (ML×PW, 166 litters, PW+ML, 173 litters) were compared. The conception rate of the four genotypes was similar (77.5-79.4%). The effect of genotype on body weight of does at parturition (PW:4.30 kg, ML:4.05 kg, MLPW:4.16 kg, PWML: 4.16 kg,  $P<0.001$ ) and on number of kits born alive (NBA) (PW:7.88, ML:8.19, MLPW:8.38, PWML:8.91,  $P<0.05$ ) was significant. On the contrary, differences in total number of kits born (TNB) were not significant (PW:8.44, ML:9.04, MLPW:9.29, PWML: 9.61,  $P=0.125$ ). The size of the heterosis in TNB and in NBA was 5.7 and 7.6%, respectively. After equalization of litter size for 8.03-8.33 in each genotype no heterosis was found in litter size or in litter weight at 21 days of age. The best crossing combination was PW×ML.

### Behaviour and welfare

**EFFECTS OF EARLY HUMAN CONTACT ON THE BEHAVIOUR AND REPRODUCTIVE PERFORMANCE OF NEW-ZEALAND WHITE RABBITS.** CSATÁDI K.<sup>1</sup>, MAKRAY J.<sup>2</sup>, EIBEN Cs.<sup>3</sup>, KUSTOS K.<sup>3</sup>, MAROS K.<sup>2</sup>, BILKÓ Á.<sup>1</sup>, ALTBÄCKER V.<sup>1</sup>, <sup>1</sup>Eötvös Loránd Univ., Dpt. of Ehtology, Budapest; <sup>2</sup>Szent István Univ., Dpt. of Appli. Ethology, Gödöllő; <sup>3</sup>Res. Inst. for Anim. Breed. and Nutr., Div. of Small Anim. Prod., Gödöllő; csatikati@gmail.com

Influence of early handling on the behaviour, growth rate, and reproductive performance of New-Zealand white rabbits was investigated. Handling was consisted of touching the kits during nest checking in accordance with the daily routine of the farm. Half of the rabbits were handled within half an hour after the daily nursing when kits are extremely sensitive to any intervention. The remaining animals were handled at least two hours after nursing when they are out of the sensitive period. At one month of age kits' behaviour toward humans was tested. Reproductive performance of mated or artificially inseminated does was estimated at six months of age measuring litter weight and litter

size. Our results showed that handling within half an hour after nursing efficiently reduced kits' avoidance of humans. The growth rate of the two groups did not differ significantly. According to our study the litter size of does handled within half an hour after nursing and mated naturally was higher compared to other group. Nevertheless, independently of handling status naturally mated does had heavier litters. Handling procedure resulted rabbits showing less fear toward humans and improved reproductive performance of does. Furthermore, it is easy to carry out under farm conditions so its application can be suggested for rabbit farms.

---

**NURSING BEHAVIOUR OF RABBIT DOES DEPENDING ON THE LIGHTING REGIME.**

GERENCSÉR Zs., OROVA Z., MATICS Zs., PRINCZ Z., NAGY I., RADNAI I., BIRÓNÉ-NÉMETH E., SZENDRŐ Zs., *Univ. Kaposvár, Fac. of Anim. Sci., Kaposvár; gerencserzsolt@freemail.hu*

In this study nursing behaviour of does was examined, comparing the commonly used (16h light: 8h dark /16L/) and periodic lighting (8L:4D:8L:4D/8L/). The experiment was carried out at the rabbit farm of the University of Kaposvár on Pannon White rabbits (n=37). Does were randomly housed in two identical rooms. Rooms differed only in the lighting regime. From kidding till 17 days post partum 24-hour video recordings were taken with infra red cameras (16L: n=13; 8L: n=24). According to the results it can be established that in group 16L the proportion of nursing once, twice or three times was 58.3, 35.4 and 6.3%, resp., while in group 8L it was 64.9, 28.8 and 6.3%, resp. In group 16L in case of nursing once a day 82.3% of that was performed in the dark period. In case of nursing twice a day the first nursing was performed in the dark, while the second one in the light period. In group 8L in case of nursing once a day 42% of the does nursed their kits in the first dark period, while 58% of them nursed randomly in the remaining 20 hours. In case of nursing twice a day the first nursing was performed in the first 4 dark and the following 4 light hours, while the second nursing was performed mainly in the second dark period. No significant difference

was found in the nursing duration between groups. However in the first 4 days post partum the nursing duration was significantly longer in both groups.

---

**EXAMINATION OF FREE CHOICE OF RABBIT BUCKS AMONG DIFFERENT CAGE-FLOORS.**

MATICS Zs., NAGY I., BIRÓNÉ NÉMETH E., RADNAI I., GERENCSÉR Zs., PRINCZ Z., GYOVAI P., SZENDRŐ Zs., *Univ. Kaposvár, Fac. of Anim. Sci., Kaposvár. maticszsolt@freemail.hu*

The aim of the experiment was to find a favourable floor type for rabbit bucks. Seven bucks at the age of 25-34 weeks were housed individually in a block of four pens. The floor-space of the block was 2 m<sup>2</sup>. Each pen (with the floor-space of 0.5 m<sup>2</sup>) contained a 30 cm long feeder and two nipple drinkers. Pens differed only in their floor: one of them had plastic net, another one had plastic slat, while the other two had wire net floor. Rabbits were able to move among pens through swing-doors. of each animal was registered every ten minutes. Altogether 5040 recordings were evaluated. Rabbits preferred plastic slat floor (36.1%), however the plastic net floor was visited above the average (32.1%). The most refused floor-type was the wire net (13.6-18.2%). The floor-type preference varied within the 5 days examined and according to the part of the day. On the first day no difference was found in the preference of the two types of plastic floor (plastic net and plastic slat). On days 2, 3 and 4 the plastic slat, while on day 5 the plastic net floor was preferred significantly. In the dark (active) period (12 pm – 4 am) the preference of the plastic slat floor was more expressed than in the light period (12 am – 4 pm). Our results show that rabbit bucks prefer plastic net or plastic slat to wire net floor. According to our study the plastic slat floor meets the requirements of animal welfare principally.

---

**EFFECT OF THE TYPE OF GNAWING STICK ON THE PRODUCTIVE PERFORMANCE AND THE INCIDENCE OF EAR LESIONS OF GROWING RABBITS.** PRINCZ Z., NAGY I., RADNAI I., BIRÓNÉ NÉMETH E., MATICS ZS., GERENCSÉR ZS., SZENDRŐ ZS., *Univ. of Kaposvár Fac. of Animal Sci.; Kaposvár, princzzoltan@freemail.hu*

The aim of the experiment was to study the effect of hard or soft gnawing stick on growing rabbits. The Pannon White rabbits (n=156) were weaned at 5 weeks of age and housed in pens (0,86 m<sup>2</sup>, 13 rabbits/pen, 16 rabbits/m<sup>2</sup>) with wire net floor till 11 weeks of age. Three groups were established: H=hard gnawing stick (*robinia*); S = soft gnawing stick (*tilia*); C=control (without gnawing stick). The type of gnawing stick in comparison to C group had no effect on weight gain, body weight, feed intake and feed conversion. The gnawing stick consumption was significantly ( $P<0.001$ ) higher in the S group (between 5 and 11 weeks of age: H=0.11 vs. S=1.24 cm<sup>3</sup>/day/rabbit). In the group S the percentage of ear lesions was significantly ( $P<0.05$ ) lower at the age of 11 weeks than in the other two groups (C=17.3%; H=7.7% and S=1.9%). Since application of gnawing stick (especially made of soft tree e.g. *tilia*) reduces the frequency of abnormal and aggressive behaviour forms but it has no influence on rabbit's production, its use can be suggested in case of group housing.

**EFFECT OF HOUSING CONDITIONS ON THE BEHAVIOUR OF GROWING RABBITS.** PRINCZ Z<sup>1</sup>., DALLE ZOTTE A<sup>2</sup>., RADNAI I<sup>1</sup>., BIRÓ-NÉMETH E<sup>1</sup>., MATICS ZS<sup>1</sup>., GERENCSÉR ZS<sup>1</sup>., NAGY I<sup>1</sup>., SZENDRŐ ZS<sup>1</sup>., <sup>1</sup>*Univ. of Kaposvár Fac. of Anim. Sci., Kaposvár;* <sup>2</sup>*Univ. of Padova, Dpt. Anim. Sci., Legnaro, Italy; princzzoltan@freemail.hu*

The aim of this research was to examine the effects of the housing conditions (group size, floor type and environmental enrichment) on the behaviour – as a welfare indicator – of growing rabbits. The experiment was carried out at the University of Kaposvar on Pannon White rabbits. The five week-old rabbits were housed in cages (2 rabbits/0.12 m<sup>2</sup>, n=72) or in pens (13 rabbits/0.86m<sup>2</sup>, n=104) with the stocking density

of 16 rabbits/m<sup>2</sup>. Half of the cages and of the pens had wire net, while the other half of them had plastic net floor. In every second cage and pen (with wire net or plastic net floor) a wooden gnawing stick was fixed onto the wall. Video recordings were taken at 6.5 and at 10.5 weeks of age between 11.00 am – 05.00 pm and between 11.00 pm – 05.00 am. Pen housed rabbits spent less time on resting (58 vs. 67%) and their locomotor activity (6.7 vs. 3.8%) was higher compared to cage housed group. However, the frequency of aggressive behaviour was also higher in pen (0.14 vs. 0.01%). The floor type had no significant effect on any behavioural characteristics (eating, drinking, locomotor activity, resting, comfort, social behaviour, investigatory behaviour and aggressive behaviour). On the other hand, using environmental enrichment (gnawing stick) decreased significantly the occurrence of ear injuries (0.05 vs. 0.22%).