World Rabbit Science

World Rabbit Sci. 2010, 18: 37 - 41
doi:10.4995/wrs.2010.18.06

ABSTRACTS OF THE "21st HUNGARY CONFERENCE ON RABBIT PRODUCTION"

Kaposvár, Hungary. May 27, 2009.

About 90 participants took part at the 21st Hungarian Conference on Rabbit Production at Kaposvár, organized by the University of Kaposvár, the Hungarian Branch of the WRSA, the Rabbit Production Board and the Agribrands Europe Hungary Inc. This is the largest and most popular event of the rabbit breeders in Hungary. Twelve papers were presented by senior and young scientists. The topic of the papers covered some fields of rabbit production (production, housing and welfare, reproduction, genetics and nutrition). Full papers are available from the organizer (Szendro.Zsolt@ke.hu) on request.

PRODUCTION

SITUATION OF RABBIT PRODUCTION IN HUNGARY IN 2008

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In 2008, the total quantity of the Hungarian rabbit production was 9,900 tons in live. The production level decreased as well 4,900 tons was exported. The amount of meat (fresh) was exported to Italy, Switzerland, Germany and Belgium. The proportion of rabbits produced in small farms did not change, it was about 5%. The price of live rabbits (paid by the slaughter houses) increased by 30 HUF/kg to 370 HUF/kg. The costs of rabbit production decreased by 10% in 2008, the feed cost by 15%, so the total costs of 1 kg of live rabbit was around break even 300-320 HUF/kg. Rabbit production profitability was around break even in 2008. The ratio of the export is 94-95% so the home consumption is only 5-6% shows a non significant growth.

HOUSING AND WELFARE

ENVIRONMENTAL CONDITIONS REQUIRED FOR THE RABBITS' WELL BEING

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The study demonstrates the environmental peculiarities of the European wild rabbits. All benefits (higher survival rate against predators) and costs (aggressive behaviours, stress, higher risks of infections or injuries, competition for nest sites) aspects are summarized, being decisive for the rabbits to live in smaller and larger colonies or individually. For the farmed rabbits most of the benefits (e.g. surviving of predation) disappear, yet disadvantages of group-living remain. Rank order can be observed in the same way as for the European wild rabbits, causing stress and aggressive behaviour, some does kindle into the nest of each others, decreasing the reproductive performance and longevity of the does and increasing the mortality of the kits. These phenomena are against the aspects of well being, therefore for the breeding rabbits only the individual housing can be advocated. For the growing rabbits the possible largest groups that can be reared together are the litter mates. Mixing rabbits from different litters to the same groups generates more disadvantages than benefits. Based on previous studies, disadvantages (consumption of litter material, decreased weight gain, body weight, dressing out percentage, increased risk of coccidiosis and digestive tract disorder based mortality as a consequence of litter consumption) of rearing the rabbits on deep litter are summarized. For the growing rabbits above the temperature of 15-16°C staying on wire net is preferred, as compared to deep litter. Contrary to the several disadvantages due to the lack of information, the consumers show preference for rabbit meat originated from animals kept on deep litter. The consumers' demands and the rabbits' preference can be partly harmonized when the rabbits are reared on wire net after weaning, then during the second phase of the rearing deep litter material is used. Comparing the production and behaviour of rabbits kept on wire net, plastic net or plastic slat no differences were found, although the younger rabbits preferred the plastic net

floor. Comparison of different floor types (based on the diameter of the net, hole shape /rectangle, square etc/) is necessary to develop the most suitable floor type beside the favorable characteristics of the wire net floor.

EXAMINATION OF GROWING RABBITS HOUSED IN CAGES OR IN PENS WITHOUT OR WITH PLATFORM

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The objective of this study was to test a new combination of deep litter and wire net floor. The experiment (2nd replication) was conducted at Kaposvár University using Pannon White rabbits (n=193). The following experimental groups were formed: C=20 cages (2 rabbits/cage, n=40); P16=3 pens (14 rabbits/pen, 16 rabbits/m^2, n=42); P11=3 pens (9 rabbits/pen, 11 rabbits/m^2, n=27); PW=3 pens with wire net elevated platform (14 rabbits/pen, 11 rabbits/m^2, n=42); PD=3 pens with elevated platform deep litter on it (14 rabbits/pen, 11 rabbits/m^2, n=42). Rearing the rabbits in group PD decreased feed intake (FI), body weight (BW), average weight gain (AWG) and dressing out percentage (DoP). Significant (P<0.05) differences were found between group PD and P16 or P11 in BW (2841 and 2980 or 3012 g, resp.), in BWG (44.4 and 47.7 or 48.4 g/d, resp.), between PD and C or P11 in FI (130 and 146 or 151 g/d, resp.), between PD and C in DoP (60.5 and 62.0%) and between PD and C or P16 in the ratio of hind part (38.8 and 38.1 or 38.1%, resp.). No significant differences were observed for feed conversion ratio, mortality, or perirenal and interscapular fat percentage. In group PD, 16.7, 53.7 and 29.6% of the rabbits were located on the platform (1/3 basic area), under the platform (1/3 basic area) and at areas near the feeder or drinker (1/3 basic area). In group PW, the main location of rabbits was more balanced (on the platform: 30.3%, under the platform: 34.6%, near the feeder or drinker: 35.6%. The combination of wire net and deep litter floor (group PD) negatively affected production, whereas the higher possibility for locomotory behaviour and staying on deep litter is considered more favourably by consumers. The rabbits can freely choose their location, and the litter can also be easily replaced with the use of a removable platform.

LIGHT COLOUR PREFERENCE OF GROWING RABBITS

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The objective of the experiment was to evaluate the light colour preference of growing rabbits in case of a free cage choice. The experiment was carried out on Pannon White growing rabbits weaned at the age of 5 wk (n=128) and placed to cage blocks (2 m^2, 16 rabbits/m^2). The rabbits could move freely among four cages (0.5m^2 each) through swing doors. The cages differed only in the colour of the light applied (white, yellow, green or blue). The daily lighting was 16 h. From the age of 6 wk 24 h infrared video recording was performed, once a week. The number of rabbits in each cage was counted every 15 min for a period of 5 wk. Feed consumption was measured weekly. Between the ages of 6 and 10 wk the rabbits preferred white colour light (28.0%). The observed (decreasing) preference order was the following: yellow (26.3%), blue (23.4%) and green (22.3%) (P<0.001). With the processing age the difference between the cage preferences decreased. The period of the day did not affect the cage preference, during the dark period the same cage (lighted by the same colour) was chosen as in the light period. No significant differences were recorded in the feed consumption in the cages. Based on the results it can be concluded that the cage preference of the rabbits was slightly affected by the light colour.

REPRODUCTION

INFLUENCE OF ALTERED NURSING AND NUTRIENT SUPPLY OF RABBIT DOES ON THE PRODUCTION

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The effect of altered nursing and fasting before AI on subsequent reproduction and growth of current litters was studied in multiparous does (n=480). Control rabbits (K) nursed freely and were fed *ad libitum*. Does for local farm practice (T) nursed controlled using a metal-plate at separation until d 14 and freely up to weaning (d 35) and were fed *ad libitum*. In three biostimulated groups, there was a shift from free to once-a-day nursing (i.e. controlled on d 9, 10 and 11) with wire-mesh separation (BD), metal-plate insertion (BF) and nest-tray removal (BE) and return to free nursing on d

12 till weaning and using *ad libitum* feeding. In caloric biostimulated group (BB) free nursing with a 24 h fast (between d 8 and 9, i.e. only water was given between 10 am Tuesday and 10 am Wednesday) and a 48-50 h re-feeding before AI was performed (*ad libitum* feeding from 10 am Wednesday and AI at d 11, Friday in the morning). The best doe and litter performances were found with biostimulation based on changed nursing and using a metal-plate at separation (BF). So, in the BF does the kindling rate, number of born alive and weight of marketable rabbits per doe were 10%, 1.2-kit and 0.7 kg higher than in the K does, respectively. Reproduction however, did not improve by fasting (BB) but the live weights of the BB and K kits at weaning and slaughter were comparable. Because of less kit mortality, 1.4 kg more marketable rabbits per doe were obtained in the BB than in the K does.

EFFECT OF LIGHTING REGIME ON PERFORMANCES OF RABBIT DOES

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The objective of the experiment was to compare different lighting regimes. The experiment was made with Pannon White rabbits. The does were randomly housed in two buildings. In the first room a 16L lighting regime was applied (16L, n=60), in the second room a 8L lighting schedule was used which was extended 8 d prior to insemination (11 d) by a 1 hour light period inserted into the middle of the 16-hour dark period (8+1L, n=59). Number of inseminations per parturition, mortality during the suckling period and condition measured by the TOBEC method was identical for both groups (16L and 8+1L: 1.18 and 1.16, 4.2 and 4.7%, E-value: 1943 and 1937, respectively). Significant differences were obtained for litter size (16L and 8+1L: total born=9.23 and 8.69, born alive=8.83 and 8.24, at day 35=8.29 and 7.84), litter weight (16L and 8+1L: born alive=556 and 532 g, at day 21=3280 and 3159 g, at day 35=8219 and 7741 g), individual weight (16L and 8+1L: born alive=63.7 and 66.1 g, at day 21=390 and 400 g), body weight of the does (16L and 8+1L: at parturition=4093 and 4184 g, at day 21=4689 and 4792 g, at day 35=4530 and 4611 g) and for feed consumption between 21 and 35 d of the lactation period (16L=688, 8+1L=660 g/d). Based on the results the biostimulation effect of the additional 1 hour lighting period could not be established as a favourable pregnancy rate was recorded also for the 16L group (84.7%). On the contrary, the extra lighting period decreased the litter size and consequently the litter weight. Conducting further analyses can be advocated.

EFFECT OF AGE OF KITS OF FEED CHANGE FROM MATERNAL TO GROWING PELLET

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The objective of the study is to evaluate the effects of age of kit at changing feed on the production of the does and growing rabbits. The rabbit does were housed to 2 identical rooms differing only in the lighting schedule. In both rooms two further groups were formed based on the rabbits' feeding. In the first group the does and their kits received breeding pellet till weaning (BB group; n=60). In the second group the breeding pellet was replaced by growing pellet at the 21st d of lactation (BG group; n=59). The composition of the breeding and growing pellet was: 10.5 MJ/kg DE, 17.8% crude protein, 13.6% crude fibre and 9.7 MJ/kg DE, 16.0% crude protein, 17.2% crude fibre. The rabbits were fed both pellet types *ad libitum*. The conditions of randomly selected rabbit does of every group were evaluated by TOBEC measurements. The kits were weaned at the age of 35 d of age. After weaning all kits consumed the same pellet *ad libitum* and the production of 60-60 growing rabbits was monitored. The results were evaluated by means of multifactor ANOVA (fix effect: lighting schedule, type of feeding and random effect: parity) except for the mortality which was analyzed by χ^2-test. No significant differences were observed for the number of insemination per kindling, for litter weight at kindling or at 21d of lactation and for litter size (total, born alive, litter size at 21 and 35 d). The changing of the pellet affected the body weight of the rabbit does at the 35th d of lactation (−80 g, P=0.016, BG<BB), the individual and litter weight of the kits at the 35th d of lactation (−326 g, P=0.001; −42 g, P<0.001, BG<BB) and the condition of the does after parturition (e-value: BB: 1922 *vs*. BG: 1957, P=0.024). For the growing rabbits the weight differences that were observed at weaning remained until the end of the growing period (11 wk of age) (5 wk of age: +54 g, P=0.008; 7 wk of age: +74 g, P=0.014; 9 wk of age: +91 g, P=0.007; 11 wk of age: +91 g, P=0.033 in favour of BB group). No significant differences were observed for feed consumption and for feed conversion ratio. Based on the results, feeding the rabbits with breeding pellet until their weaning was favourable.

GENETICS

COMPARISON OF PRODUCTIVE AND CARCASS TRAITS OF DIFFERENT GENOTYPES

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The objective of the study was to compare the production and carcass traits of three rabbit genotypes having different adult weight. The maternal line was selected for litter size (M; n=31) (adult weight /AW/ 4.0-4.5 kg); the Pannon White (P; n=32; AW: 4.3-4.8 kg) and a large sized (L; n=32, AW: 4.8-5.4 kg) paternal line were selected for weight gain and for carcass traits (using CT-data). The average daily gain (between the ages of 5 and 11 wk) of the L rabbits exceeded that of the P and M rabbits by 4.3 and 8.8 g, respectively ($P<0.001$). Differences of 272 and 491 g were found for 11 wk old body weight. The daily feed intake of the L rabbits was 17 and 23 g higher than that of the P and L groups ($P<0.001$). The feed conversion ratio and the mortality rate of the 3 genotypes did not differ. The highest dressing out percentage (61.3%) was observed in the P rabbits, which exceeded the M group by 1.1% ($P<0.05$). The dressing out percentage of the L group rabbits was also favourable (61.1%). Compared to the reference carcass, the ratio of the fore part was the highest (26.9%) and the lowest (25.7%) for the L and P groups, respectively. The opposite order was recorded for the ratio of the hind part (L: 37.2%, P: 38.2%). The perirenal fat ratio was similar for each genotype. These results appear to indicate that feed intake and final weight are determined by the adult body weight (of the genotypes) (the large sized line showed the most favourable performances); whereas the dressing out percentage and the ratio of the fore and hind parts are determined by CT-aided selection (P rabbits achieved the best results).

COMPARISON OF PERFORMANCE OF GROWING RABBITS ORIGINATED FROM DIFFERENT CROSSING COMBINATIONS. 1. PRODUCTION TRAITS

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The aim of the experiment was to study the effect of dam and sire genotypes on the live performance of growing rabbits. The experiment was carried out at Kaposvár University. Pannon White and Maternal line does were inseminated with the sperm of Pannon White (P), Maternal line (M), Large-bodied line (L), Terminal line of Hycole hybrid (H) or Coloured line (C). M, P and C were medium sized; L and H were large-sized genotypes. P and L genotypes were selected for carcass traits by CT. The rabbits were weaned at the age of 5 wk and housed in wire net cages. Daily lighting was 16 h and the temperature 15 to18°C. Rabbits were fed *ad libitum* a commercial pellet. Water was available *ad libitum* from nipple drinkers. Examining the dam breed effect, the daily weight gain (+ 5.7 %, $P<0.001$) and the gain-to-feed ratio (−6.7 %, $P=0.004$) of the progenies of P does were better than those of the M does. Examining the sire breed effect, the body weight and the daily weight gain were higher in groups H and L; whereas those of the progenies of M and C sires were worse. Body weights at 11 wk of age were: H: 2918 g, L: 2793 g, P: 2678 g, C: 2636 g, M: 2585 g ($P<0.001$). Similar differences were found in daily feed intake. Gain-to-feed ratio did not differ significantly. It was concluded that the live performance of growing rabbits was affected by the adult weight of their parents.

COMPARISON OF PERFORMANCE OF GROWING RABBITS ORIGINATED FROM DIFFERENT CROSSING COMBINATIONS. 2. CARCASS TRAITS

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The aim of the experiment was to study the effect of dam and sire genotypes on the carcass traits of growing rabbits. The experiment was carried out at Kaposvár University. Pannon White and Maternal line does

were inseminated with the sperm of Pannon White (P), Maternal line (M), Large-bodied line (L), Terminal line of Hycole hybrid (H) or Coloured line (C). M, P and C were medium sized, L and H were large sized genotypes. P and L rabbits were selected by CT data for carcass traits but the other genotypes were not. Rabbits were slaughtered at 78 d of age. Examining the dam breed effect, the weight of the chilled carcass and body parts was higher in the progenies of the P does. The ratio of the hind part to reference carcass was higher in the P group (37.7 *vs*. 37.2%, $P<0.001$); the ratio of fore part, however, was higher in group M (26.2 *vs*. 26.5%, $P<0.001$). Examining the sire breed effect, the weights of the chilled carcass and of the carcass parts were highest in the progenies of the H sires and lowest in group M. The differences in group dressing out percentage were not significant (60.0-60.8%). The ratio of the fore part to reference carcass was higher in groups L, H and C, whereas the ratio of the middle part did not differ. The ratio of hind part to the reference carcass was highest in group P progenies and lowest in groups L and C (38.0 *vs*. 37.2 and 37.0%, $P<0.05$). The ratio of perirenal fat was lowest in group P and highest in the progenies of L and M sires (1.79 *vs*. 2.06 and 2.00%, $P<0.05$). It was concluded that the weights of the carcass and of the carcass parts were influenced by adult weight, whereas the ratio of fore and hind parts and fat deposit to reference carcass were affected by CT-aided selection.

GENETIC PARAMETERS OF CARCASS TRAITS IN PANNON WHITE RABBIT POPULATION

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CT and test slaughter results of 278 ten week old Pannon White rabbits were analyzed. The rabbits were reared at the Experimental rabbit farm of the Kaposvár University. The main traits that were considered in the analysis were the following: CT-based thigh muscle volume, thigh muscle weight (based on test slaughter), dressing out percentage, weight gain, ratio of the fore, mid and hind body parts (compared to the reference carcass). The Pearson correlation coefficient between the CT based thigh muscle volume and thigh muscle weight was high (0.77) but it was far from unity. The moderately high correlation coefficients between the thigh muscle volume/weight and dressing out percentage (0.45-0.53) were favourable. The selection on weight gains seems to increase also the thigh muscle volume/weight (0.51-0.52). Taking into account the seasonal (batch) effects did not modify the results.

NUTRITION

THE EFFECT OF FEED SUPPLEMENTED BY DIFFERENT TANNIN LEVELS ON THE PRODUCTION AND CARCASS TRAITS OF GROWING RABBITS

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The objective of the experiment was to analyze the production and carcass traits of growing rabbits fed pelleted diets either medicament-free or supplemented with a coccidiostatic drug, or supplemented with 3 different chestnut hydrolysable tannin extract levels, respectively. From the age of 18 d, the rabbits were fed a diet supplemented with a coccidiostatic drug (Cc), or with tannin (400 g/100 kg: T400). At weaning (35 d of age) the 5 following dietary sub-groups were formed in both groups: medicament-free (CO), supplemented with coccidiostatic drug (Cc), and increased levels of hydrolysable tannin (Farmatan) (T200, T400 and T600). At weaning, the body weight of the Cc rabbits was significantly higher than that of the T400 rabbits (974 *vs*. 940 g, $P<0.05$). Except for this finding the experimental diets did not influence the growing rabbit production (weight gain, body weight, feed consumption, feed conversion ratio, mortality). The two diets given prior to weaning significantly affected the perirenal fat weight (Cc=28.9 and T400=26.3 g; $P<0.05$). The rabbits fed tannin supplemented pellets after weaning had a higher mid-part ratio compared to the reference carcass ($P=0.1$). Because the mortality rate was low in all groups (CO, T200 and T600=5.9%, T400=1.4%, Cc=0%, NS), it can be concluded that no positive effect can be expected when the population analyzed is healthy and housing conditions and feed compositions are adequate.