

ABSTRACTS OF THE 27TH HUNGARIAN CONFERENCE ON RABBIT PRODUCTION**Kaposvár, Hungary, May 20, 2015.**

About 100 participants took part in the 27th Hungarian Conference on Rabbit Production at Kaposvár, organised by the Kaposvár University, the Hungarian Branch of the WRSA and the Rabbit Production Board. This is the largest and most popular event for rabbit breeders in Hungary. Thirteen papers were presented by senior and young scientists. Topics of the papers covered almost all fields of rabbit research (production, housing and welfare, reproduction, genetics, nutrition). Full papers are available from the organiser (matics.zsolt@ke.hu) on request.

SITUATION OF RABBIT PRODUCTION IN HUNGARY IN 2014

JURÁSKÓ R.

Rabbit Production Board, Széchenyi str. 141, H-2220 Vecsés, Hungary.

info@nyultermektanacs.hu

The Hungarian Rabbit Production Board has been working for 20 yr, helping the rabbit sector. Compared to 2013, purchasing of live rabbits and rabbit meat exports increased by 5%, mainly due to the stabilisation of market conditions. The Euro/HUF exchange rate was favourable in export terms. Last year the prices of feed ingredients and pellet dropped slightly, although other costs increased. The price of live rabbits (1.5-1.7 Euro/kg live weight) increased slowly. The price of sold rabbits housed in alternative systems (rearing on deep litter, etc.) was higher, around 15-20%. Small scale rabbit production provides only 1-2% of the total purchased quantity. The ratios of the Pannon White, Hycole, Zika and Debreceni White among breeding animals were 47, 40, 9 and 3%, respectively. There are 60-65 large rabbit farms in Hungary, producing approximately 101000 rabbit does. The 2 slaughterhouses process 98-100 thousand growing rabbits per week. Only 1.8-2% of the total rabbit meat produced is sold in supermarkets in Hungary. The aim of the Hungarian Rabbit Production Board is to increase the current growth in rabbit production (4.7 million) to 7 million per year until 2020.

RABHO – AN INTERNATIONAL RESEARCH PROJECT ON RABBIT HOUSING

HOY S., MASTHOFF T., BUHL M.

Department of Animal Breeding and Genetics, Justus Liebig University of Giessen, Leihgesterner Weg 52, D 35392 GIESSEN, Germany.

Steffen.Hoy@agr.uni-giessen.de

The ANIHWA ERA-Net initiative started on January 1st 2012 aims to increase the cooperation and coordination of national research programmes in animal health and welfare of farm animals. The international rabbit research project RABHO on the ANIHWA (animal health and welfare) platform is jointly run by partners from Italy (I), Hungary (H), Spain (SP) and Germany (D). The transnational ANIHWA network RABHO (Development and assessment of alternative animal-friendly housing systems for rabbit does with kits and growing rabbits) focuses on the development and investigation of different newly developed housing systems for does with kits and growing rabbits. Preliminary results are presented on a new combi system for does with kits kept in single boxes, followed by group housing of fattening rabbits until slaughter after removal of side walls and transfer of does after weaning to another unit. It can be concluded that groups of 4 litters kept in the combi system reached significantly lower daily gains than the groups of 8 litters. It remains to be seen whether this significant difference between the 2 groups and the positive effects of the new housing system persist in further investigations. In a second sub-project, a newly developed group-housing system for does with kits was designed

with a single area and a group area. The single area can be reached by does through cat flaps using individual electronic identification. Subjectively, until now no strong agonistic behaviour has been detected. High animal losses cannot be explained by antagonistic behaviour or diseases, but improvements to this investigated housing system are necessary. In fattening rabbits, conventional flat-decks were compared with 2 new rabbit parks with a floor area of 30000 cm², elevated platform and groups of 38-49 rabbits. In the first 4 rounds, the daily gain in both rabbit parks was significantly lower compared to the daily gain of those in the flat-deck system. The use of partially unperforated flooring as required in the German Rabbit Housing Directive has clear disadvantages in comparison to perforated floors with regard to rabbit hygiene and the occurrence of foot lesions.

THE RABBIT AS AN EXPERIMENTAL MODEL

FEKETE S. GY., KORSÓS G.

Szent István University, Faculty of Veterinary, H-1078, István Str. 2, BUDAPEST, Hungary.

sandorgyorgyfekete@gmail.com

The paper overviews the role of rabbit in the development of science on a historical scale. The rabbit is widely used in classical genetic, immunological, physiological and reproductive biology (see Freedman test), as well as in embryological research. This species is indispensable in studying both spontaneous and induced malformations. The rabbit is an essential contributor to the research into biological rhythms. They are excellent models of allotriophagy and its dependency on the environment and feed composition, but cannot replace the horse in digestibility studies. Among metabolism models, there is an outstanding rabbit model (WHHL) for atherosclerosis as well as one for Alzheimer disease. Given the body measurements and anatomy, the rabbit is a good subject for bone and tooth research. The main ophthalmologic fields apply techniques developed for cataract and laser treatments, implantation of shunts, intravitreal drug application and improvement of surgery techniques. In biotechnology, the rabbit serves as a bioreactor to produce mono and polyclonal antibodies, as well as recombinant proteins for human use. Infectious diseases like tuberculosis and many parasitoses can be modelled in rabbits. Using artificially immune-impaired rabbits, the study of important human opportunistic pathogens (e.g. Pneumocystis) is possible. Being a caecotroph animal, the rabbit is extremely sensitive to mycotoxins (e.g. T-2 toxin), both in female and male genders.

EFFECT OF LIGHTING ON RABBIT AND ITS ROLE IN RABBIT PRODUCTION

SZENDRŐ ZS., MATICS ZS., GERENCSÉR ZS.

Kaposvár University, Faculty of Agricultural and Environmental Sciences, Guba S. str. 40, H-7400, KAPOSVÁR, Hungary.

szendro.zsolt@ke.hu

Life is based on sunlight. Light is also important for nocturnal animal species such as wild or domesticated rabbits. They are able to see well at night, although their colour vision is limited. Rabbits are exposed to a periodic light:dark environment which generates a 24-h period (circadian) rhythm of almost every body function. When rabbits lived in continuous light or dark, the daily rhythms were slightly longer or shorter than 24 h, respectively. The daily activity of wild rabbits depends on the season (time of sunrise and sunset), and that of farmed rabbits on the time of lighting being switched on and off. Strong seasonal effects can be found in reproduction and fur shedding. In farms, the seasonal effects are limited when continuous 16-h lighting is applied. Changing from 8-h light to 16-h light 8 d before insemination is effective to increase the receptivity and kindling rate. Maturation of Rex rabbit fur can be accelerated and its quality improved by changing the photoperiod from long day to short day. The wool production of angora rabbits can be increased by shortening the light period or by melatonin treatment. Lighting programmes are applied for different purposes on rabbit farms.

CHOICE OF RABBIT DOES AMONG NEST BOXES DEPENDING ON NEST MATERIAL

FARKAS T.P.*, SZENDRŐ ZS.*†, MATICS ZS.*, MAYER A.‡, RADNAI I.*, ODERMATT M.†, GERENCSÉR ZS.*

*Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40. KAPOSVÁR, Hungary. †Olivia Ltd., H-6050 Mizse 94. LAJOSMIZSE, Hungary. ‡J. Rettenmaier & Söhne GmbH + Co. KG D-73494 ROSENBERG, Germany.

farkas.peter@ke.hu

The experiment was conducted at Kaposvár University. The choice of multiparous rabbit does (n=37) among nest boxes bedded with different nesting materials (hay, straw, fine fibre material –Lignocel®– or wood shavings) was observed. In each wire-net pen (1.0×1.83 m) 1 doe and 4 nest boxes (0.37×0.23 m) with different nest materials were randomly placed 3 d before the expected parturition. Some 48.6% of the does kindled in nest boxes with pure materials (Lignocel®: 40.5%, straw: 5.4%, hay: 2.7%), while 51.3% of the does mixed the nest materials: does carried Lignocel® (21.6%) or Lignocel® and hay (5.4%) into the nest box bedded with straw; Lignocel® (8.1%) into the nest box bedded with wood shavings; and hay and straw

(5.4%) into the nest box bedded with Lignocel[®]. It can be concluded that rabbit does preferred kindling in nest boxes bedded with Lignocel[®], and most of them refused the nest box with wood shavings.

EFFECT OF DIFFERENT NEST MATERIALS ON REPRODUCTION PERFORMANCE OF RABBIT DOES

ARKAS P.*, SZENDRŐ Zs.*[†], MATICS Zs.*, MAYER A.[‡], RADNAI I.*, ODERMATT M.[†], GERENCSÉR Zs.*

*Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40. KAPOSVÁR, Hungary. [†]Olivia Ltd., H-6050 Mizse 94, LAJOSMIZSE, Hungary. [‡]J. Rettenmaier & Söhne GmbH + Co. KG D-73494 ROSENBERG, Germany.

farkas.peter@ke.hu

The experiment was conducted at Kaposvár University. Pannon Ka and Pannon White (multiparous) rabbit does (n=200) were randomly divided into 4 groups according to the nest materials used for bedding the nest box: hay (n=50), straw (n=50), wood shavings (n=50), long, thin wooden fibre material (Lignocel[®], J.Rettenmaier&Söhne GmbH, n=50). The experiment started at the 27th day of pregnancy. Photos were taken of the nests 4-5 d after parturition which were assessed by experienced evaluators using nest quality scales of 1-5. According to the results, the quality of the nests bedded with the 4 nesting materials was significantly different. The hay nest had the best quality scores, followed by straw and Lignocel[®]. The nests made of wood shavings were judged to be the worst quality. Nest material did not influence the litter size, litter weight or individual weight at day 21. No significant difference was found in suckling mortality between 0-21 d. Kit mortality was the lowest in nests bedded with wood shavings (12.4%) or straw (12.9%), and the highest in nests bedded with hay (17.2%), while the Lignocel[®] nests showed intermediate mortality (15.1%).

NUTRIENT SUPPLY OF SUCKLING KITS

KACSALA L., MATICS Zs., KASZA R., GERENCSÉR Zs., SZENDRŐ Zs.

Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

kacsala.laszlo@ke.hu

In general, rabbit does nurse the kits once a day for 3-4 min. During this time the kits are able to consume their daily feed requirement, which is roughly equal to 1/6 of their body weight. The milk intake, weight gain and survival of the kits depend on the milk production and the willingness of their does to nurse. However, the does are not able to produce enough to meet the nutrient needs of the suckling kits. The aim of the study was to examine the nutrient supplementation of kits and highlight the

deficiencies in nursing systems. The study summarises the effect of using two nursing does for one litter and the health influence of this technique. It emphasises the physiological aspects of consuming the doe's faecal pellets.

EFFECT OF LIGHTING SCHEDULE BEFORE INSEMINATION (8L:16D → 8L:4D:4L:8D) ON THE PRODUCTION OF RABBIT DOES

GERENCSÉR Zs., SZENDRŐ Zs., RADNAI I., MATICS Zs.

Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

gerencser.zsolt@ke.hu

The objective of the experiment was to compare different lighting schedules. The experiment was performed with nulliparous Pannon Ka rabbit does. The does were randomly housed in 2 identical rooms. In the first room a 16L:8D lighting schedule was applied (16L, n=54), while in the second room a 8L:16D lighting schedule was used which was extended 8 d prior to insemination (day 11) by a 4 h light period inserted into the 16-h dark period (8L:4D:4L:8D; 8+4L, n=54). Number of inseminations per parturition was identical for both groups (16L: 1.14 and 8+4L: 1.13). Differences were obtained for litter size (at day 21=9.09 and 8.70, $P=0.001$; at day 35=8.93 and 8.45, $P<0.001$, in 16L and 8+4L, respectively), litter weight at day 21 (16L: 3214 g and 8+4L: 2993 g, $P<0.001$), individual weight at day 35 (16L: 795 g and 8+4L: 824 g, $P<0.001$), and kit mortality between days 0 and 21 (16L: 3.7% and 8+4L: 7.5 %, $P<0.001$). Based on the results, the biostimulation effect of the additional 4 h lighting period could not be recommended. In contrast, the litter size and consequently the litter weight decreased when 4-h extra light was added in the middle of the 16-h dark period.

EFFECT OF DIVERGENT SELECTION FOR TOTAL BODY FAT CONTENT MEASURED BY COMPUTER TOMOGRAPHY ON THE PERFORMANCE OF RABBIT DOES. PRELIMINARY RESULTS

KASZA R., DONKÓ T., SZENDRŐ Zs., RADNAI I., KACSALA L., GERENCSÉR Zs., SZABÓ P.G., MATICS Zs.

Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

kasza.rozalia@ke.hu

The hypothesis was that selection for total body fat content is appropriate to improve the condition of rabbit does. The experiment was conducted at Kaposvár University. We examined 527 Pannon Ka rabbits (142 males and 209 females) by computer tomography (CT) at 10 wk of age. Divergent selection process was based on the fat

index, calculated by determining the ratio of the total body fat volume (mL) measured by CT to the body weight (kg). The rabbits with the lowest fat index became the Minus (M) selected and that of the highest values became the Plus (P) selected breeding animals. Sixty-nine males and 120 females were chosen for future breeding animals. Eighteen week old Plus and Minus selected female rabbits (n=120) were randomly housed in flat deck cages. Plus (n=60) and Minus selected does (n=60) were inseminated with the semen of Plus (n=34) and Minus selected bucks (n=35), respectively. The reproductive performance of the does was examined during the first 4 consecutive reproductive cycles. Body weight of the does at kindling, kindling rate, litter sizes at birth, at day 21 and 35, and mortality of kits between 0-21 and 0-35 d showed no significant differences between the groups in the first generation.

EFFECT OF DIGESTAROM® SUPPLEMENTATION ON PERFORMANCE OF RABBIT DOES

CELIA C.*†, GERENCSÉR ZS.*, FARKAS T.P.*, DALLE ZOTTE A.†, CULLERE M.†, SZENDRŐ ZS.*

*Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

†Department of Animal Medicine, Production and Health, University of Padova, Agripolis, Viale dell'Università, 16, 35020 LEGNARO, Padova, Italy

szendro.zsolt@ke.hu

The aim of the experiment was to investigate the effects of dietary Digestarom® supplementation on the reproductive performance of rabbit does. One hundred and three Pannon Ka (maternal line) multiparous rabbit does were randomly divided into 2 groups. In the control group (n=51), the rabbit does were fed with commercial diet (C), in the other group (n=52), the rabbit does received the same diet supplemented with 300 mg/kg of Digestarom® herbal extract (D). Two reproductive cycles were evaluated. Some rabbit does refused the supplemented feed during the first pregnancy and lactation, so the feed intake was not counted. At the second kindling there were differences in body weight of does (C: 4535 vs. D: 4300 g, $P<0.05$) and kindling rate (C: 73.5 vs. D: 47.1%, $P<0.01$), presumably because the refusal of D feed by the does led to poor body condition. The individual weight of kits was also affected at day 7 (C: 154 vs. D: 147 g, $P<0.05$) and at day 21 (C: 354 vs. D: 338 g, $P<0.05$) throughout the experimental period (1st and 2nd reproductive cycles). Digestarom® supplementation seemed not be able to improve the reproductive performance of the rabbit does.

ESTIMATION OF HERITABILITY AND GENETIC CORRELATIONS BASED ON *IN VIVO* COMPUTER TOMOGRAPHY MEASUREMENTS AND TEST SLAUGHTER IN GROWING PANNON WHITE RABBITS. PRELIMINARY RESULTS

CZAKÓ B.*, DONKÓ T.*, BÁZÁR GY.†, KOVÁCS GY.†, SZABÓ P. G.*, MATICS ZS.*, GERENCSÉR ZS.*, RADNAI I.*, NAGY I.*

*Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

†Analytical Minds Ltd., DEBRECEN, Hungary.

nagy.istvan@ke.hu

The investigation was based on 316 records of 11 wk old Pannon White rabbits. Computer tomography (CT) data and slaughter results were analysed. The rabbits were reared at the experimental rabbit farm of Kaposvár University. CT scanning of the animals was carried out using Siemens Sensation Cardiac CT. The rabbits were slaughtered at 11 wk of age at the average body weight of 2.82 kg. The main traits obtained in the analysis were as follows: total body volume determined by CT (tvol_ct, cm³), muscle volume of the whole body determined by CT (tm_ct, cm³), fat volume of the whole body determined by CT (tf_ct, cm³), muscle volume of the hind legs determined by CT (hlm_ct, cm³), fat volume of the hind legs determined by CT (hlf_ct, cm³); live body weight before slaughter (bw, g), weight of hind legs (hl_sl, g). The examined traits were evaluated with the REML using bivariate models, contained year-month and sex as fixed effects and body weight before slaughter and total body volume as covariates. The software suites applied were PEST (Groeneveld, 1990) (used only for data coding) and VCE 6 (Groeneveld, 2008). The heritability of the tf_ct and the heritability of the hlf_ct were higher (0.61 and 0.58, respectively) compared to the hlm_ct (0.50) and the tm_ct (0.28), respectively. The fat and muscle related traits showed negative genetic correlations: between hlf_ct and hlm_ct it was negative and high (-0.59); between tf_ct and tm_ct it was negative and high (-0.96); between hlm_sl and hlf_ct it was negative and moderate (-0.34).

RABBIT AS A SYMBOL

METZGER Sz.

Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary.

metzger.szilvia@ke.hu

The paper summarised the literature on symbolism of the rabbit. The rabbit symbol is depicted by the ancient Egyptians and Mexicans and in modern literature, as well as in the myths and legends of Moon rabbit and Easter rabbit. Rabbit could be a totem so the meaning of rabbit

totems and the things that could be learned from the rabbit are also summarised.

BOTH MATERNAL CONDITION AND EARLY HANDLING INFLUENCE THE FEAR LEVEL OF WEANED DOMESTIC RABBIT

DÚCS A.[†], ALTBÄCKER V.*^{*}, BILKÓ Á.[†]

*Kaposvár University, Faculty of Agricultural and Environmental Sciences, H-7400, Guba S. str. 40, KAPOSVÁR, Hungary. [†]Eötvös Loránd University, Department of Ethology, H-2131, Jávorka str. 14, GÖD, Hungary.

altbac@gmail.com

Previous studies found that regular human contact early in life resulted in a decreased fear reaction in rabbits. Among rodents it has been shown that this decreased fear response is a consequence of rapid learning process, which can be influenced by stress events mothers are exposed to

during pregnancy and lactation. Rabbits show extremely limited maternal care for a few minutes nursing per day, so the possibility for such maternal impact is limited. The present study investigated whether the ontogeny of fear reaction in domestic rabbits is affected by the fear level of their mother. Therefore, behaviour of kits of previously handled (tame), and unhandled (fearful) does were compared as a function of human handling of kits. Weaned kits showed reduced fear at if both they and their mothers had previously been handled during the first week of their life. More surprisingly, kits of previously non-handled does showed fear responses toward human beings even if they were handled. Unhandled kits of previously non-handled mothers showed the highest level of fear reaction during the test sessions. The present results suggest that, even in rabbits showing extremely limited maternal care, maternal condition during pregnancy and lactation may influence later fear behaviour in rabbit kits.