

## Abstracts of the “GIORNATE DI CONIGLICOLTURA ASIC 2005”

Forlì, Italy 30 September -1 October, 2005.

---

This first Italian Rabbit Days, product of the collaboration between ASIC (Italian Rabbit Scientific Association), Avitalia and the Forlì Fair, and sponsored by ASPA (Animal Production Scientific Association), was mainly focussed on rabbit production sector throughout a round table about “Legislative aspects and use of drugs in rabbits” during the first day. The second day had a scientific character including 2 reviews of experts on current topics as the nutrition and gut barrier function in meat rabbits, and the value creation in rabbit industry. A total of 26 scientific communications were presented in 2 oral communication sessions and 1 poster session: **First Session** In this first session were presented 3 communications on rabbit Nutrition and Management, and 3 on rabbit Welfare. **Second Session.** This session was focussed on rabbit Meat Quality, with 2 communications, and Pathology, including 7 communications. Finally a **Poster Session** recovered the works presented by 11 European scientific teams.

---

**NUTRITION AND GUT BARRIER FUNCTION IN MEAT RABBITS.** CARABAÑO R., GARCÍA J., NICODEMUS N., DE BLAS C. *Dpt. Producción Animal. Univ. Politécnica de Madrid. rosa.carabano@upm.es*

The mechanisms of defence of the rabbit against gut pathogens (especially gut barrier function and competitive exclusion) and the nutritional strategies to improve its intestinal health are reviewed in the framework of epizootic rabbit enteropathy. The importance of mucosa integrity derives from the fact that either saprophyte or pathogenic bacteria need the interaction with the intestinal mucosa to exert their beneficial or pathogenic effects. The gut barrier function is exerted in a first step by the protective effect of the mucus layer. Its composition and interaction with the intestinal microbiota are discussed. Once the bacteria or toxins have passed through the mucus layer they enter in contact with the intestinal mucosa and the next defence mechanism is played by the gut associated lymphoid tissue. This mechanism is complex and closely related with the characteristics of the microbiota or other antigens in contact with the mucosa. The balance between saprophyte and pathogen bacteria in the gut is also a key factor

for competitive exclusion mechanism. In rabbits just after weaning the gut barrier function is not completely developed so increasing the risk of digestive disorders. Therefore a special diet might be recommended for these animals. The effects of the type of diet on gut barrier characteristics (morphology of mucosa, functionality and immune response) have been summarised from recent results. These studies indicated that mortality increased both under and above 30% dietary neutral detergent fibre. The fibre quality was also important and the inclusion of moderate levels of soluble fibre (10-12%) improved gut barrier function and intestinal health. Similarly, the reduction of ileal flux of nitrogen, obtained by reducing the protein level or using more digestible protein sources, improved rabbit health.

---

**VALUE CREATION IN RABBIT INDUSTRY.** BERTAZZOLI A., GHELFI R. *Dpt. di Economia e Ingegneria Agrarie. Alma Mater Studiorum, Univ. di Bologna. aldo.bertazzoli@unibo.it*

The capability of firms to compete on markets is linked more and more to the development of integration relationships between firms

operating at different stages of the production chain. Thus the value created by an integrated production system arises both from the efficiency of single firms and the development of cooperative relationships. In rabbit meat production chain this kind of relationship is rather frequent and it could be a worthwhile task to assess the total value created by this chain and the value distribution among firms. The paper describes first the economical profile of the rabbit meat production chain, considering the organizational and technological relationships between enterprises. Then, accounting data of about forty firms (five years records per firm on average) has been processed to evaluate the total return that come out from internal activities developed along the chain and its distribution. First result is the assessment of the high level of costs related to the acquisition of production inputs. Consequently, the profitability of the rabbit meat production chain seems to be highly dependent on external factors, such as little changes in prices of meat and production factors (mainly feed). In the distribution of total return, firms involved in slaughtering and dissection benefit of the main quota (36%), while meat distributors get about the 33% of total return. Rabbit farming gains a little part of total return (10%), while a greater quota, related to the low level of input, is achieved by energy distribution firms.

---

**IN VITRO FERMENTATION CHARACTERISTICS OF RABBIT FEEDSTUFFS: COMPARISON OF TWO DIFFERENT INOCULA.** BOVERA F., DI MEO C., PICCOLO G., MARONO S., NIZZA A. *Dpt. Sci. Zootecniche e Ispezione degli alimenti. Univ. di Napoli Federico II.* bovera@unina.it

The fermentation characteristics of three feedstuffs (alfalfa meal, beet pulp, barley) commonly used in rabbit feeding were studied by *in vitro* gas production technique (IVGPT). The substrates were incubated up to 96 h with two different inocula from caecal and colon contents of adult rabbits and the gas production was recorded at regular intervals for 20 times. At the end of the fermentation, pH, organic matter degradability (OMd) and some fermentation parameters (maximum fermentation

rate and time at which was reached, cumulative gas production) were obtained. There were no significant differences between the caecum and colon inocula, while the fermentation characteristics of the feedstuffs were significantly different. Barley showed the highest ( $P<0.01$ ) OMd (84.3%) and maximum fermentation rate values (11.5 ml/h) compared to alfalfa meal (43.1% and 2.97 ml/h) and beet pulp (75.5% and 5.86 ml/h).

---

**LONG-TERM EFFECT OF POST-WEANING REPRODUCTIVE RHYTHM IN A COMMERCIAL RABBITRY.** CASTELLINI C., DAL BOSCO A., CARDINALI R. *Dpt. di Biologia Vegetale e Biotecnologie Agroambientali e Zootecniche. Univ. Studi di Perugia.* cesare@unipg.it

The aim of the study was to compare two different reproductive protocols based on standard (11 d after kindling) or post-weaning AI (27 days post-partum). Two groups of 600 New Zealand White females were inseminated for two years. Does submitted to post-weaning rhythm had a higher ( $P<0.01$ ) receptivity and fertility even if the annual rabbit weaned was lower. The litter size and litter weight were higher and mortality was lower. Compared to controls, the length of doe's reproductive life was longer as well as their survival, so that the number of kindling/doe was higher. It is evident that the extensive rhythm is more adapted to doe physiology even if there is a risk of fattening the does.

---

**EFFECT OF WEANING AGE ON BODY WEIGHT AND SOLID FEED INTAKE IN YOUNG RABBIT BEFORE WEANING.** CESARI V.\*, TOSCHI I.\*, GRILLI G.†, CESARI N.\*, CASTROVILLI C.\* *Ist. di Zootecnia Generale, Fac. di Agraria, Univ. degli Studi di Milano. †Dpt. di Patologia Animale, Igiene e Sanità Pubblica Veterinaria, Fac. di Medicina Veterinaria, Univ. degli Studi di Milano.* cesari@unimi.it

Food consumption and body weight of two groups of 30 litters weaned at 25 or 34 days of age were recorded to study the effect of weaning age on body weight and solid feed intake. The data recorded showed that early weaning determined a higher feed intake, due to need of litters to compensate for lack of maternal milk,

and a decrease of weight gain after weaning. The lower solid food ingestion of litters between 18° and 24° days of age does not seem enough to advise the formulation of a specific diet in this period, while the higher feed intake from 25<sup>th</sup> till 28<sup>th</sup> days of age suggests to give a specific diet which meets young nutritional requirements.

**HEALTH AND ZOOTECHNICAL SURVEY TO EVALUATE “ON FIELD” PARAMETERS ASSESSING THE WELFARE OF INDUSTRIAL RABBIT FARMING.** CERIOLO M.\*<sup>†</sup>, BRIVIO R.\*<sup>†</sup>, SALOGNI C.\*<sup>‡</sup>, GRILLI G.\*<sup>‡</sup>, LAVAZZA A.\*<sup>‡</sup> *Ist. Zooprofilattico Sperimentale della Lombardia ed Emilia Romagna, Lab. Microscopia Elettronica.* <sup>†</sup>*Veterinario S.A.T.A. -Sezione conigli- Regione Lombardia.* <sup>‡</sup>*Dpt. di Patologia Animale, Igiene e Sanità Pubblica Veterinaria. Anatomia Patologica e Patologia Aviare Univ. degli Studi di Milano. alavazza@bs.izs.it*

Our study aims to set up a record for defining some health and zootechnical parameters able to contribute to evaluating the welfare of industrial rabbit farming. Samples were taken in 8 farms to investigate the health and immunological conditions. The enteric problems were the most relevant in rabbit farming being *E. coli* isolated from almost 50% of 154 rabbit examined. Sera were taken from 30 days old rabbit, which resulted negative for anti RHDV antibodies, with the only exception of one farm that resulted positive with low titres (1/20-1/80) probably due to maternal antibodies, and from 60 days old rabbits, which in two farms showed anti-RHDV antibodies (titres 1/80-1/640) thus suggesting the presence of “natural antibodies” probably induced by rabbit calicivirus (RCV). Low titres (1/10-1/20) of maternal anti-myxomatosis antibodies were detected in 30 days whilst the older non vaccinated rabbits were all negative. An high prevalence (60%) for *E. cunicoli* was found in most farms. In addition to health and zootechnical parameters, more data referred to environmental situation as well as biochemical and haematological parameters will be in the future considered to better define the rabbit welfare conditions in industrial farms.

**NEW BLOOD ANALYSES IN HERD AND IN LABORATORY: PRELIMINARY RESULTS IN FIVE RABBIT HERDS.** MASOERO G.\*<sup>†</sup>, BERGOGLIO G.\*<sup>†</sup>, GIRAUDO S.\*<sup>†</sup>, SALA G.\*<sup>†</sup>, BARGE P.\*<sup>‡</sup>, BARDI L.\*<sup>‡</sup>, CHICCO R.\*<sup>‡</sup> *\*CRA-Ist. Sperimentale per la Zootecnia, Torino.* <sup>†</sup>*ASL 17, Saluzzo (CN).* <sup>‡</sup>*DISCIZO, Fac. Agraria, Univ. degli Studi di Torino, Grugliasco.* <sup>§</sup>*CRA-Ist. Sperimentale per la Nutrizione delle Piante, Torino. masoero@isz.it*

New attempts to assess hematological status in rabbits using a minimum amount of blood were investigated. By first, capillary haematocrites of 135 rabbits in five herds on two seasons were scanned by FT-NIR Spectroscopy. Significant validated relationships ( $R^2_{val}=0.93$ ) between herds were enhanced. By second, on a restricted number of rabbits (N=14) a small volume of blood was immediately analysed by an i-STAT instrument (HESCA) measuring the following parameters: Na, K, Cl, blood urea nitrogen (BUN), glucose, haematocrit (HCT), pH, partial pressure of carbonic anhydride ( $pCO_2$ ), and calculating: haemoglobin (HB), base excess ( $BE_{ecf}$ ), anions difference ( $An.Gap=(Na+K)-(Cl+HCO_3^-)$ ), total carbonic anhydride ( $TCO_2$ ) and bicarbonate ( $HCO_3^-$ ). In April vs. October Na (142 vs. 139) and BUN (51 vs. 35) were increased, while An.Gap,  $pCO_2$  and glucose (135 vs. 144) appeared reduced. Significant differences between herds affected Na, BUN, An.Gap,  $HCO_3^-$ ,  $BE_{ecf}$  and  $pCO_2$ . The interferograms were significantly related to all parameters ( $R^2_{val}$ ): K: 0.88; pH: 0.84; An.Gap: 0.73;  $TCO_2$ : 0.67;  $BE_{ecf}$ : 0.66;  $HCO_3^-$ : 0.65;  $Cl^-$ : 0.56; BUN: 0.53; Glucose: 0.52; HB: 0.51; Na: 0.47;  $pCO_2$ : 0.39. The study emphasizes the relevance of BUN, Glucose and haemogas parameter, as well as of NIR Spectroscopy in blood capillary as sign of environmental and multifactorial causes of variation.

**SPECTROSCOPY OF RABBIT DORSAL REGION AND HAIR: PRELIMINARY RESULTS.** MASOERO G.\*<sup>†</sup>, BERGOGLIO G.\*<sup>†</sup>, GIRAUDO S.\*<sup>†</sup>, SALA G.\*<sup>†</sup>, BARGE P.\*<sup>‡</sup>, BARDI L.\*<sup>‡</sup>, CHICCO R.\*<sup>‡</sup> *\*CRA. Ist. Sperimentale per la Zootecnia, Torino.* <sup>†</sup>*ASL 17, Saluzzo (CN).* <sup>‡</sup>*DISCIZO, Fac. Agraria, Univ. degli Studi di Torino, Grugliasco.* <sup>§</sup>*CRA. Ist. Sperimentale per la Nutrizione delle Piante, Torino. masoero@isz.it.*

A first original study carried on *in vitro* dorsal hair from 151 healthy or died rabbits showed innovative results by coupling the FT-NIR spectra (1000-2500 nm) of the hair to the condition of supposed healthy status coded by extremes 1 (died) and 2 (live) ( $R^2_{\text{validation}}=0.67$ ) as well as about the originality of six involved herds ( $R^2_{\text{val}}=0.64$ ). A second study carried on *in vivo* with 127 white rabbits, by a portable spectrometer UV-Vis-NIR LabSpec©PRO (ASD) in two herds showed strong relationships between light spectra and the live body weight ( $R^2_{\text{val global}}=0.83$ , SEV 0.34 kg, interval 0.65-4.04 kg). The relationship confirmed in both the herds was surprising strong in the NIR part as well as in the UV-Visible band of the spectrum, with evidences in the red (647-747 nm), accounting for 69% (E) and 48% (F) of the body live weight variation, and in the NIR band 2271-2275 nm. It was assumed that the relationship with the red in the visible range may contains a kind of "environmental mark" due to the progressive contamination in the cages not remedied by the care of the animals, as well as a possible browning of the white hair according the natural ageing. These ontogenic relationships operate by age factors and they will deserve additional researches oriented to differential body composition and to welfare area.

---

**CARCASS AND MEAT QUALITY OF LEPRINO OF VITERBO BREED RABBIT REARED WITH THREE DIFFERENT HOUSING SYSTEMS.** CONTÒ M. \*, BALLICO S. \*, NEGRETTI P. †, BIANCONI G. †, FAILLA S. \* *Ist. Sperimentale per la Zootecnia di Roma, Monterotondo (Rm).* †*Ist. di Zootecnia, Univ. della Tuscia, Viterbo.* [betti.failla@isz.it](mailto:betti.failla@isz.it).

The aim of this work is to investigate the effects on the meat quality of three housing systems and compare the performances of Leprino of Viterbo with commercial hybrid bred in intensive system. The experiment was carried out on 68 male rabbits, 51 of Leprino of Viterbo and 17 of commercial hybrid, intensively reared in cages (HI). The Leprino of Viterbo animals were divided in three housing type: 17 open air (A), 17 on the turf with mobile cages (GT) and 17 intensively reared in cages (I). We studied quality

characteristics of *Longissimus thoracis et lumborum* muscles. The dissection of the thighs didn't show high differences for meat and bone percentage, but rabbits intensively bred were significantly leaner compared to the others (2.27% vs. 3.01% in average between I and HI, versus A and GT for total fat). Generally the LD of rabbit bred in intensive system were significantly more tender (1.66 kg in average between the two groups in raw meat and 1.65 kg in cooked one), while GT group was tougher than others (2.13 kg and 2.25 kg for raw and cooked meat respectively). In conclusion the housing system influences the carcass and meat quality.

---

**PREDICTION OF CHEMICAL AND REOLOGICAL CHARACTERISTICS OF RABBIT MEAT BY NIRS (NEAR INFRARED REFLECTANCE SPECTROSCOPY).** TROCINO A., CARRARO L., XICCATO G. *Dpt. Sci. Animali, Univ. degli Studi di Padova, Legnaro.* [gerolamo.xiccato@unipd.it](mailto:gerolamo.xiccato@unipd.it)

Fresh minced meat of hind leg from 515 rabbits was analysed by NIRS. Calibration equations were calculated by PLSR to predict the chemical composition and reological characteristics of fresh meat, the slaughter weight and dressing percentage of rabbits, as well as the muscle to bone ratio of hind leg, the shear force and cooking losses of meat. NIRS prediction was accurate for all chemical variables ( $R^2_{\text{cv}}=0.52$  to 0.85). NIRS prediction of pH was fair ( $R^2_{\text{cv}}=0.45$ ), while the prediction of colour was unsatisfactory ( $R^2_{\text{cv}}<0.25$ ). NIRS prediction of meat shear force gave scarce results, while was better for cooking losses ( $R^2_{\text{cv}}=0.49$ ). The rabbit weight at slaughter, the dressing percentage and the muscle to bone ratio of hind leg showed an intermediate degree of correlation with the NIR spectra ( $R^2_{\text{cv}}=0.34$  to 0.38).

---

**ANTIMICROBIAL SUSCEPTIBILITY AND DETECTION OF RESISTANCE GENES IN ENTEROPATHOGENIC *E. COLI* (EPEC) ISOLATED FROM DIARRHOEIC RABBIT IN CAMPANIA REGION.** CERRONE A., PERUGINI A.G., BARTOLI M., CAPUANO F. *Ist. Zooprofilattico Sperimentale del Mezzogiorno.* [annacerr@tin.it](mailto:annacerr@tin.it)

Ninety-five rabbit enteropathogenic *E. coli* (EPEC) isolates recovered from diagnosed cases

of colibacillosis, already examined for typical virulence-factors (intimin and fimbriae), were analyzed for susceptibility to antimicrobials of veterinary significance in rabbit meat production and genetic relatedness. Antimicrobial resistant phenotypes were observed in 100% of *E. coli* isolates, with the majority of isolates showing resistance to oxytetracycline (91.6%), doxycycline (88.4%), neomycin (85.2%), cephalothin (77.9%), trimethoprim-sulfamethoxazole (49.5%), amoxycillin (37.9%), gentamicin (37.9%), colistin sulphate (24.2%), flumequine (21%) apramycin (20%), aminosidine (16.8%), enrofloxacin (6.3%) and norfloxacin (1%). PCR was used to characterize genetic elements of resistance for sulfametoxazolo-trimethoprim, gentamicin, neomycin and apramycin. The results have shown the presence of genotypes in 89.3% of strains resistant to trimethoprim-sulfamethoxazole, in 36.8% of strains resistant to apramycin, in 27.8% to gentamicin and only in 1.2% to neomycin.

#### ANTIMICROBIAL SUSCEPTIBILITY TO ZINC BACITRACIN OF CLOSTRIDIUM PERFRINGENS FIELD STRAINS ISOLATED FROM RABBITS:

**PRELIMINARY RESULTS.** AGNOLETTI F.<sup>\*</sup>, BACCHIN C.<sup>\*</sup>, BANO L.<sup>\*</sup>, GUOLO A.<sup>\*</sup>, PASSERA A.<sup>†</sup>, FAVRETTI M.<sup>†</sup>, MAZZOLINI E.<sup>†</sup> <sup>\*</sup>Ist. Zooprofilattico Spe. delle Venezie, Lab. di Treviso, Treviso. <sup>†</sup>Ist. Zooprofilattico Spe. delle Venezie, Lab. di Udine, Campoformido, Udine. [fagnoletti@izsvenezie.it](mailto:fagnoletti@izsvenezie.it).

The pathogenic role of clostridia in rabbit enteropathies is well known and there are some recent evidences of an involvement of *C. perfringens* in ERE syndrome. To control the ERE syndrome as well as the clostridiosis the zinc bacitracin is widely used in commercial rabbit farms in Europe. Nevertheless data regarding the *in vitro* efficacy of zinc bacitracin against clostridia of rabbit origin are not available. In this study the minimal inhibitory concentrations (MICs) of zinc bacitracin were evaluated in n.100 *C.perfringens* strains isolated from rabbits of Italian fattening units. The agar dilution method was performed in supplemented Brucella Agar as recommended by the NCCLS document M11-A6. Most strains (94%) presented low MIC (<0.5 µg/ml ) values and only some strains

(3%) were inhibited by a 1 µg/ml concentration. Two isolates (2%) displayed a 16 µg/ml MIC value. The MIC values of *C.perfringens* ATCC reference strains presented a good accordance between each batch. The presence of two strains with 16 µg/ml MIC value and the MICs bimodal distribution of the tested strains pointed out the existence of an acquired resistance against the polypeptide in strains of rabbit origin, nevertheless the MIC<sub>90</sub> of 0.5 µg/ml achieved in the study emphasized the wide susceptibility to zinc bacitracin of Italian isolates of *C. perfringens* from rabbits.

#### PREVALENCE OF VIRULENCE GENETIC MARKERS IN *ESCHERICHIA COLI* STRAINS ISOLATED FROM RABBITS.

MAZZOLINI E.<sup>\*</sup>, PASSERA A.<sup>\*</sup>, DEOTTO S.<sup>\*</sup>, BANO L.<sup>†</sup>, TISATO E.<sup>‡</sup>, BACCHIN C.<sup>†</sup>, GUOLO A.<sup>†</sup>, CATTOLI G.<sup>‡</sup>, AGNOLETTI F.<sup>†</sup> <sup>\*</sup>Ist. Zooprofilattico Spe. delle Venezie, Lab. di Udine, Campoformido, Udine, Italy. <sup>†</sup>Ist. Zooprofilattico Spe. delle Venezie, Lab. di Treviso, Treviso. <sup>‡</sup>Ist. Zooprofilattico Spe. delle Venezie, Area Sanità Animale, Legnaro. [emazzolini@izsvenezie.it](mailto:emazzolini@izsvenezie.it).

*Escherichia coli* is able to hart the cells of the rabbit intestine wall thanks to the eae gene product. The adhesive factors related to fimbriae and codified by af/r1 and af/r2 genes were also described in isolates of rabbit origin. The presence of the eae, af/r1 and af/r2 genes was investigated as well as the biotype (n.5 sugars in n.149 isolates) and O-type (n.18 lipopolisaccaride antigens in n.135 isolates). The af/r1 gene was never detected in the isolates. 97% of eae+ strains were af/r2+. The B12, B14, B28 and B30 eae+ strains yield the af/r2 gene in respectively the 100%, 96%, 75% and 83% of isolates. The eae+ af/r2+ strains belonging to the B12, B14 and B28 biotype were mostly O103 strains, while the B30 biotype eae+ af/r2+ was O103 in 13.3% of the strains.

#### BIOTYPING AND ANTIBIOTIC RESISTANCE OF *ESCHERICHIA COLI* STRAINS ISOLATED FROM ASYMPTOMATIC WILD RABBITS

(*ORYCTOLAGUS CUNICULUS*). GRILLI G., FERRAZZI V., GALLAZZI D. *Dpt. di Patologia Animale, Igiene e Sanità Pubblica Veterinaria. Univ. degli Studi di Milano, Milano.* [guido.grilli@unimi.it](mailto:guido.grilli@unimi.it).



One hundred wild rabbits hunted in Serio Regional Park (Bergamo, Italy) were examined. *Post mortem* examination revealed a good body condition, even in rabbits with ecto-endoparasites (*Spilopsyllus cuniculi* and *Cittotaenia spp.*). The caecum of each animal was tested bacteriologically for *E. coli*. Sixty per cent of samples were positive. Twenty-five strains were identified, biotyped and checked for antibiotic sensitivity (nalidixic acid, apramycin, chloramphenicol, chlortetracycline, ciprofloxacin, colistin, sulph.+trimethoprim, enrofloxacin, flumequine, gentamicin, neomycin, norfloxacin, streptomycin and the three sulphanilamides). Nine different biotypes were identified: B2 (n.1), B8 (4), B10 (3), B12 (4), B14 (5), B18 (1), B20 (2), B26 (1) and B30 (4). Antibiotic sensitivity varied widely: only norfloxacin was active against all the strains, chloramphenicol on 17, enrofloxacin only on 12, and chlortetracycline and the sulphanilamides were virtually inactive. The presence of different pathogenic biotypes of *E. coli* and their multi-resistance to antibiotics has never been reported in wild rabbits. These preliminary findings need to be completed with serotype studies and identification of the gene coding for intimin and adhesins, to give a fuller picture of the situation in these wild animals.

---

**GENETIC AND BIOCHEMICAL TYPING OF STAPHYLOCOCCUS AUREUS ISOLATED FROM RABBITS.** CIRCELLA E.\* , CORRENTE M.L.\* , GRECO L.† , PENNELLI D.‡ , BRUNI G.\* , MADIO A.\* , AMMOURI S. EL\* , MANGANO N.§ , CAMARDA A.\* *Dpt. di Sanità e Benessere Animale, Univ. degli Studi di Bari.* †*Veterinario Libero Professionista.* ‡*Ist. Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna.* §*A.P.A. Potenza. a.camarda@veterinaria.uniba.it.*

Random Amplified Polymorphic DNA and the API Staph (Biomérieux) method were applied for typing n. 29 *Staphylococcus aureus* strains isolated from rabbits in Southern Italy. Nine API Staph profiles and 12 RAPD types were determined respectively. The prevalence of the API Staph “f” (code: #673 61 13#) and of the RAPD-1 types, isolated respectively from 4 and 5 rabbitries has been reported. The carrying

over of strains in a farm with chronic staphylococcosis monitored in different years using both typing methods was observed. The results obtained do not help to define the virulence of strains.

---

**SEROLOGICAL CONTROL FOR MYXOMATOSIS, VIRAL HAEMORRHAGIC DISEASE AND ENCEPHALITOOZONOSIS IN FREE-LIVING RABBITS (*ORYCTOLAGUS CUNICULUS*) AND COTTONTAIL RABBITS (*SYLVILAGUS FLORIDANUS*).** FERRAZZI V.\* , POLONI R.\* , LAVAZZA A.† , GALLAZZI D.\* , GRILLI G.\* *Dpt. di Patologia Animale, Igiene e Sanità Pubblica Veterinaria. Univ. degli Studi di Milano.* †*Ist. Zoprof. Sperimentale della Lombardia e dell'Emilia Romagna, Lab. di Microscopia Elettronica, Sez. di Brescia.* [guido.grilli@unimi.it](mailto:guido.grilli@unimi.it).

In the context of two culling plans, we investigated 100 wild rabbits (*Oryctolagus cuniculus*) in August 2004 in the Serio Regional Park (Bergamo, Italy) and, between February 2003 and summer of 2004, 29 cottontail rabbits (*Sylvilagus floridanus*) in the province of Varese. Heart blood was taken on the spot and subsequently tested for myxomatosis, rabbit viral haemorrhagic disease (RHVD) and encephalitozoonosis antibodies. *Post mortem* examination revealed no specific lesions. 55 wild rabbits were positive (some with high titers up to 1:10240). High antibody levels suggest recent viral infection while only two cottontails had positive serum for myxomatosis, but with a low titer (1:10). In the cottontails titers for RHVD were negative. Antibody titers for RHVD ranging from 1:10 to 1:320 were found in 57 asymptomatic wild rabbits, despite the endemic nature of RHVD, such low levels would appear to be due either to a winter infection or to a weakly pathogenic –or even non-pathogenic– virus, since these have been found in rabbit farms in the same area. Both species were negative for Encephalitozoon cuniculi. This microsporidian parasite is common among farmed rabbits but was probably not found in our samples because free-living animals are less likely to infect each other.

---

**RESULTS OF SEROEPIDEMIOLOGICAL SURVEYS FOR THE DETECTION OF NATURAL ANTI - RHD ANTIBODIES INDUCED BY THE NON-PATHOGENIC RABBIT CALICIVIRUS (RCV) IN GROWING RABBITS.**

LAVAZZA A.<sup>\*</sup>, PERUGINI G.<sup>†</sup>, CERIOLI M.<sup>\*</sup>, CERRONE A.<sup>‡</sup>, BOTTI G.<sup>§</sup>, CAPUCCI L.<sup>§</sup>  
<sup>\*</sup>*Ist. Zooprofilattico Spe. della Lombardia ed Emilia Romagna, Lab. di Microscopia Elettronica.* <sup>†</sup>*Ist. Zooprofilattico Spe. dell'Umbria e delle Marche, Macerata.* <sup>‡</sup>*Ist. Zooprofilattico Spe. del Mezzogiorno, Portici (Na) Italy.* <sup>§</sup>*Ist. Zooprofilattico Spe. della Lombardia ed Emilia Romagna, Centro di Ref. OIE per le Malattie Emorragiche dei Lagomorfi.*  
 alavazza@bs.izs.it.

Rabbit haemorrhagic disease virus (RHDV) is a non-cultivable calicivirus that infects rabbit and causes outbreaks of an acute fatal hepatitis. Another virus, named rabbit calicivirus (RCV), related to the RHDV, was identified in healthy rabbits in Italy in 1996. This virus is non-virulent, replicates in the intestine at a low titre and presents a 92% genomic identity with RHDV. In order to check the diffusion of RCV in Italian rabbit farms we conducted, along a 5 years period, a survey respectively in 39 farms in North Italy, 23 farms in Central Italy and 21 farms in South Italy, by testing non-vaccinated 80 day old growing rabbits at slaughterhouse. The results indicate the presence of "natural antibodies" presumably induced by RCV, i.e. over 75% of animals showing titres >1/20, in almost 30% of farms controlled in North and South Italy, and in 52.2% of the farms controlled in Centre Italy.

**GENETICS OF COAT COLOR IN THE RABBIT: IDENTIFICATION OF MUTATIONS IN THE MELANOCORTIN RECEPTOR 1 (MC1R) GENE, THE EXTENSION LOCUS.** FONTANESI L., TAZZOLI M., SCOTTI E., RUSSO V. *Dpt. di Protezione e Valorizzazione Agroalimentare, Univ. di Bologna.*  
 luca.fontanesi@unibo.it.

The Extension (E) locus, that has a major role in the regulation of black/brown versus red/yellow pigment synthesis, codes for the melanocortin receptor 1 (MC1R) gene. Mutations in this gene have been indicated to affect coat colour in several species. However, in rabbit so far no information on this gene was available. Using heterologous PCR primers, a fragment of the

gene was obtained from genomic DNA of rabbits of different breeds (New Zealand White, Burgundy Fawn, Californian and Rex with black and white coat colour). Sequencing indicated that the amplified fragment belongs to the expected gene region and showed a G>A non sense single nucleotide polymorphism that was confirmed using a PCR-RFLP protocol. A deletion of 30 bp was identified in Burgundy Fawn, resulting in a translated product that, lacking several amino acids, is expected to disrupt its function and may produce the red coat colour of the breed. In other species, inactivating mutations of this gene cause the recessive "e" allele at the E locus that produces red coat colour. A second deletion of 6 bp was observed in the Californian breed. Then, using a PCR protocol, the 30 bp deletion was confirmed in several Burgundy Fawn animals and the 6 bp deletion was observed in Giant White and Checkered Giant rabbits.

**IMPROVING OF FERTILIZATION ABILITY OF RABBIT SPERMATOZOA: PRELIMINARY RESULTS.** PARKÁNYI V., ONDRUŠKA L., RAFAY J. *Research Institute of Animal Production, Hlohovska 2. 949 92 Nitra, Slovak Republic.* parkanyi@vuzv.sk.

The aim of present study was discovering the influence of extender, implementers and storage of spermatozoa at room temperature to conception rate. The trial began on 298 does of M91 and P91 lines (derived from NZW). All the does were artificially inseminated (AI) by fresh sperm (0.5 ml per does). Forty-eight hours before AI 25 I.U of PMSG per doe (Sergon, Bioveta, Czech Republic) was inoculated. Fresh semen was diluted by diluent mixture for rabbit sperm (DMRS), with antibiotic (MiniTüb, Germany) at a 1:6 rate. Spermatozoa concentration varied between 15.3x10<sup>6</sup>– 38.9x10<sup>6</sup> in insemination dose. After AI the females were immediately injected with 2.5 µg synthetic GnRH (Supergestran, Ferring-Léeiva, Czech Republic). The extender (DMRS) was dissolved for each individual experimental group: in MiliQ Synthesis (Milipore) water (control group K-118 does, conception rate: 55.93%), in bidistillate and pyrogen free water (MiniTüb, Germany), (E1 group-52 does, conception rate: 69.23%), in

bidistillate and pyrogen free water + DMSO 0.5 M (E2 group - 76 does, conception rate: 80.26%), in bidistillate and pyrogen free water + DMSO 1,75 M (E3 group-27 does, conception rate: 85.19%) and in MiliQ water + 90 min. storage of spermatozoa at room temperature (E4 group -25 does, conception rate: 56.00%). For statistic evaluation  $\chi^2$  test was used. Statistical significant improving of the conception rate was obtained with both concentrations of DMSO (for 0.5 M,  $P<0.01$ ; for 1.75 M,  $P<0.001$ ). Probably, DMSO improves the transports of all extender molecules across cell membranes of sperm and acts as a scavenger of the hydroxyl free radicals.

**EFFECT OF STARTER DIET SUPPLEMENTATION WITH EITHER MANNAN-OLIGOSACCHARIDE OR INSULIN ON HEALTH STATUS, CAECAL TRAITS AND GROWTH OF EARLY-WEANED RABBITS.** VOLEK Z.<sup>\*</sup>, MAROUNEK M.<sup>\*†</sup>, SKRIVANOVÁ V.<sup>\* \* Res. Inst. of Animal Production, Prague, Cz. Republic. † Inst. of Animal Physiology and Genetics, Prague, Cz. Republic. volek.zdenek@vuzv.cz</sup>

The aim of this study was to evaluate the effect of a dietary supplementation with either mannan-oligosaccharide (Bio-Mos, Alltech Inc.) or inulin (Frutafit® IQ) on health, caecal digesta and growth of early-weaned rabbits. A total of 330 (110 per group) and 18 (6 per group) rabbits (Hyplus®), weaned at 25 days of age, were used mainly for the health status and caecal digesta evaluation, respectively. Three experimental diets were formulated: C (control, without additives), M (supplemented with 0.3% mannan-oligosaccharide) and I diet (supplemented with 4% inulin). The chemical composition of diets was similar. The control diet was fed to rabbits of the 1<sup>st</sup> group from weaning to slaughter (74 days of age). Diets M and I were fed to rabbits of the respective group from weaning to 46 days of age, then the rabbits received control diet till slaughter. For caecal digesta sampling, rabbits were slaughtered at the age of 42 days. During the starter period (25-46 days of age), the weight gain was slightly higher in control rabbits ( $P=0.11$ ), while no differences were recorded for the whole period. The lowest morbidity ( $P=0.05$ ) as well as the health risk index were recorded in rabbits fed diet with inulin (40.0,

46.4 and 55.5% in rabbits fed I, M and control diet, respectively;  $P=0.03$ ). There were no significant differences among groups in mortality, although a lower mortality rate was observed in rabbits fed the M diet (21.8, 26.4 and 30.9% in rabbits fed M, I and control diet, respectively.) Most of the rabbits died due to specific pathogens (mainly *E. magna*, *Klebsiella sp.*, *E. coli*, *Pasteurella multocida*) between 32 and 46 days of age. After change of diets, the health risk index raised in the rabbits previously fed M and I diet, thereby no significant differences in the health status of rabbits were recorded for the whole fattening period. No significant effect of the diet was detected on both caecum relative weight and its content, as well as on dry matter concentration. However, total caecal VFA concentration was significantly higher ( $P<0.01$ ) and the pH lower in rabbits fed inulin-diet than in the caecum of other rabbits ( $P<0.01$ ). Similarly, caecal ammonia concentration decreased when rabbits received diet with inulin ( $P=0.01$ ). This study confirms the importance of using prebiotics in the rabbit diets. (The study was supported by the Czech Science Foundation: project No. 523/03/D011).

**EFFECT OF DIETARY ORGANIC ACIDS ON THE CONTROL OF ENTERIC INFECTIONS IN RABBIT.** CARDINALI R.<sup>\*</sup>, MAZZONE P.<sup>†</sup>, FORTI K.<sup>†</sup>, DAL BOSCO A.<sup>\*</sup>, SCICUTELLA N.<sup>‡</sup>, TALLARICO N.<sup>‡</sup>, CASTELLINI C.<sup>\*</sup>, RUTILI D.<sup>†</sup> *Dpt. di Biologia Vegetale e Biotec. Agroambientali e Zootecniche, Univ. di Perugia. †Ist. Zooprofilattico Spe. dell'Umbria e delle Marche, Perugia. ‡Soda -Ingredients, P. di Monaco. rcardinali@inwind.it.*

One hundred New Zealand White rabbits weaned at 28 days old, were divided into five groups and submitted to the following dietary treatments: basal diet; diet 2 (basal diet + 500 ppm oxytetracycline+200 ppm tiamuline); diet 3 (basal diet + 0.4% FormaXol - mixture of microencapsulated formic acid, citric acid and essential oils); diet 4 (basal diet + 0.5% Formyl - mixture of microencapsulated formic and citric acids) and diet 5 (basal diet + 0.4% Butyprol - mixture of microencapsulated butyrric and citric acids). At 35 days of age all rabbits were experimentally infected with *Escherichia coli*



O103 and *Clostridium perfringens* type A and clinically monitored during four weeks. Thirty days after infection, 50 rabbits were euthanized and intestinal swabs were collected from different tracts of small intestine, colon and caecum for investigation of aerobic and anaerobic bacteria. The basal diet group was the only harboured by *C. perfringens* type A, whereas, in the group fed diet 4 *E. coli* O103 was identified. From the rabbits fed diet 2 and diet 5, *E. coli* strains different from O103 were isolated. No pathogen bacteria were detected in rabbits fed diet 3. The results of this preliminary study demonstrate that the FormaXol integration is more effective than the other used to prevent the growth of pathogen bacteria in experimentally infected rabbits.

---

**CONTRIBUTION TO DEFINE THE AETIOLOGICAL ROLE OF CLOSTRIDIA IN RABBIT ENTEROTOXAEMIA.** AGNOLETTI F.\*<sup>1</sup>, BACCHIN C.\*<sup>2</sup>, BANO L.\*<sup>3</sup>, COCCHI M.\*<sup>4</sup>, GUOLO A.\*<sup>5</sup>, MAZZOLINI E.<sup>†</sup>, ROSSETTO K.\*<sup>6</sup>, ROSIGNOLI C.\*<sup>‡</sup> <sup>1</sup>*Ist. Zooprofilattico Spe. delle Venezie, Lab. di Treviso, Treviso.* <sup>2</sup>*Ist. Zooprofilattico Spe. delle Venezie, Lab. di Udine, Campoformido (UD).* <sup>3</sup>*Ist. Zooprofilattico Spe. della Lombardia e dell'Emilia Romagna, Mantova.* <sup>4</sup>*fagnoletti@izsvenezie.it*

Digestive diseases represent the main sanitary problem of rabbit breeding and clostridiosis are increasing. *C. spiroforme* and *C. perfringens* are known primary agents of rabbit enteropathy, while the aetiological role of *C. perfringens* is not yet clearly understood. Recently the role of type E *C. perfringens* is reviewed in the iota-enterotoxaemia, while type A *C. perfringens* is normally considered belonging to commensal flora. The toxin  $\beta_2$  was recently discovered in rabbit. This study describes preliminary results about clostridia isolates from enteric diseases in rabbit in the period 2004-2005. Data indicate *C. spiroforme* as the most important agent of rabbit enterotoxaemia in 2005; its role is of importance in relationship with high drug resistance and with rapid onset of the disease. The genotyping of 36 *C. perfringens* field strains shows toxin type A in 66.6% and toxin type D in 2.7% of cases. Moreover a high percentage of isolates are positive for both genes  $\alpha$  and  $\beta_2$ ,

representing a new toxin type. In the isolates *C. perfringens* type E was not demonstrated.

---

**DRUG-SUSCEPTIBILITY OF ESCHERICHIA COLI AND KLEBSIELLA PNEUMONIAE FIELD STRAINS ISOLATED FROM CASES OF ENTERIC DISEASE IN RABBIT INTENSIVE FARMS.** BANO L.\*<sup>3</sup>, CAPELLO K.<sup>‡</sup>, DEOTTO S.<sup>†</sup>, GUOLO A.\*<sup>5</sup>, ROSSETTO K.\*<sup>6</sup>, MAZZOLINI E.<sup>†</sup>, AGNOLETTI F.\*<sup>1</sup> <sup>1</sup>*Ist. Zooprofilattico Spe. delle Venezie, Lab. di Treviso, Treviso.* <sup>2</sup>*Ist. Zooprofilattico Spe. delle Venezie, Lab. di Udine, Campoformido (UD).* <sup>3</sup>*Centro Reg. di Epidemiologia Veterinaria, Legnaro (PD).* <sup>4</sup>*ibano@izsvenezie.it.*

Enteric diseases are cause of heavy losses in the intensive rabbit breeding units. Enteropathogenic strains of *Escherichia coli* and *Klebsiella pneumoniae* are the two most frequent enterobacteria isolated from the gastrointestinal tract of rabbits with diarrhoea. The present study aims to assess the evolution of drug-susceptibility of *E. coli* and *K. pneumoniae* field strains over the last few years. Antimicrobial disc susceptibility test was used to compare drug-susceptibility of 280 isolates of *E. coli* and 57 of *K. pneumoniae* collected in 2004 with 230 isolates of *E. coli* and 60 of *K. pneumoniae* collected in 2005 and 2003 respectively, towards 14 drugs. From 2004 to 2005 a significant increase of the rate of resistant strains of *E. coli* towards sulfamethoxazole-trimethoprim, gentamycin, neomycin, was observed. Furthermore colistin and aminosidine showed a significant reduction of the diameter of the zone of inhibition without exceed the limit which defines the susceptibility of the strains. From 2003 to 2005 the percentage of resistant strains of *K. pneumoniae* towards enrofloxacin resulted significantly increased, while a reduction of the zone of inhibition towards doxycycline was noticed.

---

**RABBIT MEAT PRODUCTION AS AFFECTED BY HIGH TEMPERATURES: PRELIMINARY RESULTS.** MARONGIU M.L.\*<sup>1</sup>, PINNA W.\*<sup>2</sup>, MONIELLO G.\*<sup>3</sup>, ATTARD G.<sup>†</sup>, FLORIS B.\*<sup>4</sup> <sup>1</sup>*Dpt. di Biologia Animale, Univ. di Sassari.* <sup>2</sup>*Inst. of Agriculture, Univ. of Malta.* <sup>3</sup>*marongiu@uniss.it.*

In recent years, the domestic rabbits have been recommended as a good alternative source of

dietary protein for the increasing population in developing countries, but in hot climate regions rabbit production is faced with the heat stress, responsible of remarkable production losses with negative economic spin-off. Aim of the research was to investigate, by daily controls from 6 to 12 wks of age, the effects of high environmental temperatures on: water-to-feed ratio (important index for the heat stress estimation) and daily weight gain of sixty-four New Zealand White x Californian rabbits reared in cages outdoors under canopy (OUT). Resulting data were compared to those of sixty-four rabbits indoor raised at a constant temperature of 20°C (IN). From the statistical analysis no significant correlations emerged among productive parameters and environmental temperatures (variation range 35-46°C). On the contrary, significant differences were found by comparing OUT vs. IN rabbits: water-to-feed ratio 3.7 vs. 1.7 ( $P<0.01$ ), 3.8 vs. 1.8 ( $P<0.01$ ), 3.2 vs. 2.1 ( $P<0.05$ ); daily weight gain 29 vs. 35.5 ( $P<0.01$ ), 32.6 vs. 36.4 ( $P<0.05$ ), 24.8 vs. 38.3 ( $P<0.01$ ) determined at 6<sup>th</sup>, 9<sup>th</sup> and 12<sup>th</sup> wks of age respectively. Such results represent the starting point for a wider study aimed to identify the effective requirements for rabbit meat production in hot climate regions, in order to optimise the managerial aspects for feeding strategies, reproduction and infrastructures.

---

**ELECTRONIC IDENTIFICATION FOR TRACEABILITY AND MANAGEMENT OF RABBITS.** CHIESA F.\* , BARBIERI S.\* , ZECCHINI M.\* , CRIMELLA C.\* , LUZI F.\* , RIBÒ O.\*<sup>†</sup> *Ist. di Zootechnica, Fac. di Medicina Veterinaria, Univ. degli Studi di Milano.* <sup>†</sup>*Datamars SA, Bedano-Lugano, Svizzera.* francesca.chiesa@unimi.it.

The use of electronic identification (EID) in live rabbits might be a reliable method for individual identification and traceability, allowing the improvement of the data recording and the farm management. A total of 60 hybrids (40 fattening rabbits of 55 days old and 20 nullipare does of 120 days old) were injected with 23 mm passive FDX-B transponder (Datamars, CH), preloaded into a needle in a sterilised packaged. Two body locations for transponder's injection were studied: laterally to the neck (n=30) and armpit

(n=30). Time required to perform the injection and the post-injection reading was on average 41.8±4.08 s for neck injection and 30.0±5.27 s for armpit injection. Readings of transponder were performed using portable ISO transceiver at fixed time (Idea Project, 2002). During the readings fattening rabbits were weighed; a control group of not treated animals were weight to compare the effect of procedure. Readability of transponder in the fattening rabbits until slaughter and in the does till 12 months after injection, was 100%. The excessive penetration of the needle caused the death of one doe injected in the armpit. Recovery of transponder during the slaughtering was easy with 100% of transponder recovered. Body site of injection didn't affect the migration rate, nevertheless it was low. Compared to the control group, weight of animals did not differ both body sites of injection. The EID can be used as a method for traceability and monitoring of live rabbits, allowing the improvement of the farm management.

---

**EVALUATION OF STRESS IN RABBIT USING INFRARED THERMOGRAPHY TECHNIQUE (PRELIMINARY NOTE).** LUZI F.\* , CARENZI C.\* , GARGANO M.† , LUDWIG N.G.† , VERGA M.\* <sup>†</sup>*Ist. di Zootechnica. Fac. di Med. Vet., Milano.* <sup>†</sup>*Ist. di Fis. Gen. Applicata, Fac. di SFMN., Milano.* fabio.luzi@unimi.it.

Among the main physiological stress indicators, the body temperature evaluation is very important and innovative because it may be monitored without interacting with the animal. In this first study, the rabbit species was chosen due to its physiological and behavioral characteristics and the high reproductive rhythm which allow to analyze a high number of animals with homogeneous morphological traits. The use of a thermographic system which is based on the detection of infrared radiation emitted by every object is a very suitable method in order to measure rabbit temperature without any contact, i.e. by means of a complete non invasive way. Modern thermo-cameras have a thermal resolution of few hundredth of degree and allow to determine even smallest differences in superficial temperature. A thermographic system was employed in order to single out the zones

of the rabbit skin most suitable for the temperature monitoring during stress reactions. Ten hybrid rabbits (8 fatteners and 2 does) were observed during different phases of stress reaction. The areas selected as reference for the detection of the temperature changes are: internal auricle pavilion and the peri-ocular area. The last one showed the most uniform inside the same subject and between different subjects. The mean of the standard deviations of the temperature of the subjects analysed were  $\sigma_{ey} = 0.2^{\circ}\text{C}$  and  $\sigma_{ear} = 0.5^{\circ}\text{C}$  respectively. The first results concerning the effect of stress on body temperature showed an increasing of  $0.8^{\circ}\text{C}$  and of  $1.3^{\circ}\text{C}$  in the first two trials (peri-ocular area), going by basal conditions to acute stress. Preliminary results of this research show that the thermographic technique is a suitable method for the evaluation of temperature variation on the rabbit's skin.

---

**EFFECT OF DIFFERENT HOUSING ON PRODUCTIVE TRAITS AND ON SOME BEHAVIOUR PATTERNS OF GROWING RABBITS. PRELIMINARY RESULTS.** DALLE ZOTTE A.\*, PRINCZ Z.†, SZENDRŐ ZS.†, RADNAI I.†, BIRÓ NÉMETH E.†, METZGER SZ.†, GYOVAI M.†, OROVA Z.† \*Dpt. di Sci. Animali, Agripolis, Legnaro (PD). †Univ. of Kaposvar, Fac. of Animal Sci. Kaposvár, Hungary. [dallezotte@unipd.it](mailto:dallezotte@unipd.it).

Two-hundred-twenty-eight 5-week-old Pannon White rabbits were housed in cages (2 rabbits/cage,  $0.12\text{ m}^2$ ) or in pens (13 rabbits/pen,  $0.83\text{ m}^2$ ) with the same stocking density. Half of the cages and pens had wire net floor while the other half had 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. At 11 weeks of age ear lesions were checked. Body weight of rabbits in

cages was significantly higher between 7 and 11 weeks of age. Floor type had no influence on weight gain and body weight. Rabbits in cages/pens with gnawing stick were significantly heavier at 11 weeks of age. Mortality was independent of all treatments. Gnawing stick consumption was significantly higher in pens. Ear lesions were more frequent in rabbits housed in pens or on plastic net, however, significant difference was found only between rabbits with or without wooden stick, with higher ear lesions on rabbits reared without wooden stick.

---

**THE INFLUENCE OF POST MORTEM DEBONING TIME ON RABBIT MEAT COOKING LOSS AND TENDERNESS.** BIANCHI M., PETRACCI M., SERINI C., CAVANI C. Dpt. di Sci. degli Alimenti, Alma Mater Studiorum. Univ. di Bologna. Cesena (FC). [ccavani@disa.unibo.it](mailto:ccavani@disa.unibo.it)

The “early deboning” of carcasses is well known to cause the toughening of the meat. The research was carried out in order to study the influence of *post mortem* deboning time on rabbit meat cooking loss and shear force. *Longissimus lumborum* muscle samples were dissected from 72 rabbit carcasses at different *post mortem* times (45 min, 3 h and 24 h) and used to determine the cooking loss and shear force at 24 h *post mortem*. The deboning time influenced both meat cooking loss and tenderness. The cooking loss was significantly higher in the meat dissected at 45 min and 3 h in respect with 24 h *post mortem* (29.1 and 30.0 vs. 21.4%;  $P < 0.01$ ). Shear force was lower and lower as slaughter to deboning interval increased (7.70 vs. 6.25 vs. 3.56 kg/g;  $P < 0.01$ ). In conclusion, deboning the rabbit carcasses earlier than 24 h *post mortem* negatively impairs cooking loss and tenderness of rabbit meat.

