

Abstracts of the "2ND IBERIC RABBIT CONGRESS"

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Meat quality and body composition

WATER HOLDING CAPACITY AND PH OF THE HUNTED WILD RABBIT MEAT. GONZÁLEZ-REDONDO P., CAMACHO T., ALCALDE M.J. *Dpto. Ciencias Agroforestales, EUITA, Univ. de Sevilla, Sevilla, pedro@us.es*

Percentage of released water (PRW) of the *Longissimus dorsi* (LD) and pH of the LD and *Biceps femoris* (BF) muscles were measured in 53 (49% males) wild rabbits (*Oryctolagus cuniculus cuniculus*). The pH of LD and BF muscle were 5.96 and 6.03, respectively. Both pH values were positively correlated ($r=0.861$; $P<0.001$), being the pH of BF muscle higher ($P=0.001$). There were no differences between sexes in the pH of both muscles. There were negative correlations between the eviscerated weight of the rabbits and the pH of the LD and BF muscles ($r=-0.322$; $P=0.019$). PRW from LD muscle was 17.98%, without differences neither between sexes nor due to the eviscerated weight of the rabbits. PRW and pH of LD muscle show a negative correlation ($r=-0.433$; $P=0.001$). Both muscles pH values, mainly the one of LD muscle, and PRW of LD muscle, that is described in this paper for the first time in wild rabbits, were higher in wild rabbits than the described for meat breeds in the literature. These parameters showed comparatively the same tendencies between them, and showed the same influence of the sex and weight that those described for meat breeds in the literature.

RABBIT CARCASS CHEMICAL COMPOSITION PREDICTED BY REAL TIME ULTRASONOGRAPHY. SILVA S.R., GUEDES C., MOURAO J., PINHEIRO V. *CECAV- Univ. de Trás-os-Montes e Alto Douro, Dpt. Zootec., VilaReal, Portugal. ssilva@utad.pt*

Ultrasonic measurements were taken on 52 rabbits using a real time ultrasound (RTU) machine equipped with a 7.5 MHz. Measurements of area, depth, width and perimeter *Longissimus thoracis et lumborum* muscle were taken at the 5th lumbar vertebra to estimate rabbit carcass composition. Estimates based on RTU muscle measurements allow to explain a large amount of variation (r^2 between 0.51 and 0.94; $P<0.001$) of carcass chemical composition. The results suggest that is possible to estimate rabbit carcass composition from in vivo RTU measurements.

STUDY OF BODY COMPOSITION OF RABBIT DOES BY MEANS OF BIOELECTRICAL IMPEDANCE. PART I: BODY COMPOSITION AND IMPEDANCE RESULTS. PEREDA¹ N., REBOLLAR¹ P.G., SCHWARZ¹ B.F., ARIAS-ÁLVAREZ² M., REVUELTA² L., LORENZO² P.L., NICODEMUS¹ N. *¹Dpt. Prod. Animal, ETSIA, Univ. Politécnica de Madrid. ²Dpt. Fisiología Animal, Fac. de Veterinaria, Univ. Complutense de Madrid, Madrid. pilar.grebollar@upm.es.*

The aim of this experiment was to evaluate the bioelectrical impedance technique (BIA) to estimate *in vivo* body composition of reproductive rabbit does. Eighty seven female rabbits (New Zealand x Californian, weight range: 3173-5736 g) at different physiological states were used: Pregnant and lactating (GL), pregnant and not lactating (GNL), lactating and not pregnant (LNG), not pregnant and not lactating (NGNL) and nulliparous (NUL). A four terminal body composition analyser (model Quantum II, Q 1174 II, RJL Systems, Clinton Twp. MI USA) was used to determine resistance and reactance values. After BIA assessment (five times), animals were slaughtered and stored at -20° C

until chemical analyses (dry matter, lipids, proteins, ash and energy). A significant effect of physiological state on body weight and body composition of rabbit does was observed. Means values of resistance, reactance and the length values were: $100,6 \pm 19,7 \Omega$, $24,01 \pm 7,46 \Omega$ y $19,8 \pm 2,54$ cm. Due to good repeatability of measurements we consider that two dorsal determinations with 30 minutes interval are sufficient.

STUDY OF BODY COMPOSITION OF RABBIT DOES BY MEANS OF BIOELECTRICAL IMPEDANCE. PART II PREDICTION EQUATIONS.

PEREDA¹ N., REBOLLAR¹ P.G., SCHWARZ¹ B.F., ARIAS-ÁLVAREZ² M., REVUELTA² L., LORENZO² P.L., NICODEMUS¹ N. ¹Dpt. Prod. Animal, ETSIA., Univ. Politécnica de Madrid. ²Dpt. Fisiología Animal, Fac. de Veterinaria, Univ. Complutense de Madrid, pilar.grebollar@upm.es

With the aim to determine whether BIA measurements can accurately predict body composition in rabbit does, a multiple regression analysis was employed to determine appropriate prediction equations for chemical composition including the physiological state, body weight and number of parturition as independent variables. Regression coefficients of equations to estimate water, protein, fat, ash and energy (grams) were: 0,93, 0,88, 0,69, 0,78 y 0,82 and variation coefficients were: 4,23, 5,9, 20,5, 6,88 y 10,32 %, respectively. Resistance values were negatively correlated with water content, protein, ash, number of parturition and body weight ($r = -0,32$; $r = -0,31$; $r = -0,32$, $r = -0,58$ y $r = -0,39$; $P < 0,001$) and positively correlated with fat and energy ($r = 0,31$; $P < 0,01$ y $r = 0,36$; $P < 0,001$). Also, a negative correlation between number of parturition and fat and energy content was observed ($r = -0,39$ y $r = -0,42$; $P < 0,0001$). Results from this experiment indicate that BIA can be considered a non invasive and good method for live body composition prediction of rabbit does.

INFLUENCE OF THE INCREASE OF OMEGA 3 FATTY ACID LEVEL IN THE FEED BY EXTRUDED FLAX SEED INCORPORATION (TRADI-LIN®) ON MEAT LIPIDS AND HEDONIC CHARACTERISTICS OF THE RABBIT RETAIL CUTS. COLIN M.¹, RAGUENES N.², LE BERRE G.², PRIGENT A.I.³ ¹COPRI, Ploudalmézeau, France, ²ADRIA, ZA, Quimper Cedex, France. ³EARL 3L, Ploudalmézeau, France. copri @wanadoo.fr

Four hundred 38 days old weaned rabbits were distributed either a control fedd with 2,94% of fat and 0,06% of linolenic acid (ALA) or an isoproteic and isoenergetic high level omega 3 diet with extruded flax seeds incorporation (4,45% of lipids and 0,80% of ALA). The growth was significantly decreased with the omega 3 feed (36,4 vs 38,2 g/d). For every treatment, the fore legs, hind legs, backs and livers of 35 rabbits aged of 72 days were analyzed. The omega 3 levels of the retail cuts of the rabbits fed with the high omega 3 level feed were strongly higher than these ones of the control rabbits without any alteration of the hedonic characteristics. Consequently, this experimentation confirms a relationship between the omega 3 feed level and the rabbit meat composition.

USING LUMBAR CARCASS JOINTS TISSUE COMPOSITION TO PREDICT RABBIT CARCASS TISSUE COMPOSITION. SILVA S.R., MOURAO J., GUEDES C., PINHEIRO V. CECAV – Univ. de Trás-os-Montes e Alto Douro, Vila Real–Portugal. ssilva@utad.pt

The use of 3 lumbar joints to predict the rabbit tissue carcass composition was investigated. The joint obtained between the 7th and the 5th lumbar vertebrae was consistently the best predictor of the muscle ($n=26$; $r^2=0.84$; $P < 0.001$) and fat ($n=26$; $r^2=0.81$; $P < 0.001$) in carcass. The results found encourage the use of a joint to predict rabbit tissue carcass composition.

Reproduction

EFFECT OF THE HE-NE LASER IRRADIATION ON MOTILITY AND BIOCHEMICAL PARAMETERS OF RABBIT SPERMATOZOA DURING STORAGE.

LAFFALDANO N.¹, ROSATO M.P.¹, PAVENTI G.¹, PIZZUTO R.¹, GAMBACORTA M.¹, MANCHISI A.¹, REBOLLAR P.G.², PASSARELLA S.¹. ¹Dpt. Animal, Vegetable and Environmental Sci., Univ. of Molise, Campobasso, Italy. nicolaia@unimol.it. ²Dpt. Prod. Animal, ETSIA., Univ. Politécnica de Madrid, Spain. pilar.grebollar@upm.es

The aim of the study was to investigate the effects of different energy doses of Helium-Neon (He-Ne) laser irradiation on some biochemical parameters as energetic charge (EC; sum of the ATP, ADP and AMP fractions) and free aminoacids content of rabbit spermatozoa and on sperm motility during 48 h of *in vitro* liquid storage at 15°C. 8 rabbit semen pools were divided in four aliquots: the first was the control, the other three were exposed at 3.96, 6.12 and 9 J/cm² laser He-Ne energy doses, respectively. The EC and free aminoacids were quantified with HPLC 1 h after irradiation, whereas the motility was assessed using the Accudenz[®] procedure at 0 (the irradiation time), 24 and 48 h of storage. Free aminoacids content was significantly increased by the energy dose of 6.12 J/cm² than both the control and the other irradiation treatments ($P < 0.05$), whereas laser irradiation at energy doses of 3.96 and 6.12 J/cm² significantly increased the EC ($P < 0.01$) with respect to the control. Moreover, the laser irradiation at all energy doses utilized significantly improved ($P > 0.01$) the motility at 24 and 48 h of storage. This technique could be useful to enhance the quality of stored rabbit semen.

OVULATION INDUCTION IN RABBIT DOES BY INTRAVAGINAL ADMINISTRATION OF THE [DES-GLY10, D-ALA6]-LHRH ETHYLAMIDE: PRELIMINARY STUDY.

QUINTELA L.A.^A, PEÑA A.I.^A, VEGA M.D.^A, GULLÓN J.^B, PRIETO C.^B, BARRIO M.^A, BECERRA J.J.^A, HERRADÓN P.G.^A ^ADpt. Patología Animal, Univ. de Santiago de Compostela, Fac. de Veterinaria, Lugo. ^BConejos Gallegos, COGAL S.L., Rodeiro, Pontevedra.

This study was aimed to evaluate the efficacy of [des-Gly10, D-Ala6]-LHRH ethylamide, GnRH

analogue, administered intravaginally, to induce ovulation in rabbit does submitted to AI. 39 does were divided into 3 groups that, at AI, received the following ovulation induction treatments: 1) Control group: 20 µg of gonadorelin via intramuscular; 2) 25 µg of de GnRH analog [des-Gly10, D-Ala6]-LHRH ethylamide added to the seminal dose; 3) 30 µg of [des-Gly10, D-Ala6]-LHRH ethylamide added to the seminal dose. There were 13 does per treatment and each doe was used on the same treatment for 3 successive AIs at 42 d-intervals (n=39). Fertility did not differ between the 3 groups (control: 80.6%, group 2: 82.8%, group 3: 73.3%). Prolificity or mortality at birth were never affected by any of the ovulation induction treatments.

LOCALIZATION OF THE PROLACTIN RECEPTOR IN THE OVARIAN RABBITS IN DIFFERENT PHYSIOLOGICAL STAGES.

GARCÍA-GARCÍA R.M.¹, ARIAS-ÁLVAREZ M.¹, GARCÍA-PALENCIA P.², REVUELTA L.¹, SÁNCHEZ MALDONADO B.², REBOLLAR P.G.³, LORENZO P.L.¹ ¹Dpt. Fisiología Animal, Fac. de Veterinaria, Univ. Complutense de Madrid, rosa.garcia@vet.ucm.es. ²Dpt. Patología Animal, Fac. de Veterinaria, Univ. Complutense de Madrid, ³Dpt. de Producción Animal, ETSIA, Univ. Politécnica de Madrid, Madrid.

We have been studied the immunolocalization of the prolactin receptor (PRL-R), in ovaries from 13 primiparous and second gestation rabbits. The animals were in various physiological status, as pregnant/milking (n=3), pregnant/ non-milking (n=3), non-pregnant /non-milking (n=4) and non pregnant/non-milking (n=3). PRL-R were found widely localized in many cells of the ovary; stromal and granulosa cells shown a positive signalling, mainly in antral follicles. Oocytes, follicular fluid and corpora lutea (CL) exhibited immunoreactivity for PRL-R. Ovaries of non-pregnant rabbits have shown slight higher expression of PRL-R than pregnant ones, except in luteal cells. On the other hand, internal theca and surrounding CL cells were negative for PRL-R. In conclusion, PRL-R is implicated the different-ovarian stage activity in the rabbit.

Welfare and Animal Production

EFFECT OF STOCKING DENSITY, RETAINING LITTERS AND TYPE OF CAGE ON GROWTH PERFORMANCES IN RABBITS FROM 35 TO 63 DAYS OF AGE. ALFONSO C., GARCÍA-RODRÍGUEZ A., ORTIZ A., GARCÍA-RUIZ A.I. *Nutreco PRRC, Toledo. ai.garcia@nutreco.com*

The aim of the present trial was to study the effect of stocking density, retaining litters and type of cage by measuring rabbit performances, mortality and injuries from 35 to 63 days of age. A total of 804 rabbits were used for the experiment. Animals did not show any aggressive behavior during the trial. From 35 to 49 days of age rabbits located retaining litters showed a 3 and 7% higher weights at 49 days and weight gains, respectively, and a 5.5% lower feed conversion rate than animals located mixing litters. Moreover, during the first fattening period, animals housed at 21 rabbits/m² showed a 5.6 and 2.5% lower feed conversion rate than animals housed at 18 and 16 rabbits/m², respectively. Animals located in the larger cages (38 x 100cm) and at 18 rabbits/m² reached a 16 and 14% higher feed intake and feed conversion, respectively, than animals located in the smaller cages (36 x 45cm). In the whole period, density showed a significant effect on mortality (15.3, 11.1 and 6.8% for 16, 21 and 18 rabbits/m², respectively) and animals located in the larger cages reached a 6.5, 11.4 and 10% higher weight at 63 days, weight gains and feed intake, respectively, than animals located in the smaller cages. In the first fattening period (up to 49 days of age) it could be advisable to retain litters and to house the rabbits at 18-21 rabbits/m² and in small cages. From the second fattening week on, due to the increase in the animal weight and size, the effect of the cage size should be also taken into account for further stocking density and available surface recommendations.

EFFECT OF A 48 HOURS DOE-LITTER SEPARATION ON OFFSPRING'S GROWTH. MENDOZA A.M.B.¹, SALCEDO B.R.², ECHEGARAY T.J.L.², GARCÍA S.E. ²*Dpt de Enseñanza, Investigación y Servicio en Zootec. Univ. Autónoma Chapingo. México. beamen65@latinmail.com.* ²*Dpt. Preparatoria Agrícola. Universidad Autónoma Chapingo.*

The objective of this investigation was to evaluate the effect of biostimulation (separation mother-litter) by 48 hours to the 10 days of age on the productive behaviour of the rabbits. It was made in the Unit of Production and Cunicola Investigation of the Department of Zootecnia (UPICZ), of the Universidad Autónoma Chapingo. Used 136 rabbits White New Zealand. The insemination was made to day 11 post-childbirth. The doe rabbits divided themselves randomly in two groups, (T1) without restriction of lactation and (T2) with restriction of lactation by 48 hours. Biostimulation was applied to day 10 post-childbirth. In both treatments they were handled with controlled lactation and the weights of the litter were registered before and after suckling days 4, 8, 9, 10, 11, 12, 21 and 30 to consider the milk production. The milk production, and the weight of the rabbits young to the 21 and 37 days of age were not significant differences ($P>0.05$) between treatments, obtaining themselves weights similar to the weaning. Concluding that the restriction of lactation by 48 hours to the 10 days of age significantly does not affect the productive behavior of the rabbits.

AMMONIA AS A RISK FACTOR TO RESPIRATORY PATHOLOGY IN POPULATIONS OF RABBITS FARMING UNDER INTENSIVE SYSTEM TYPE "BATICLAIR". VIEIRA-E-BRITO F.¹, PEREIRA E.¹, VIEIRA-E-BRITO M.¹, COELHO A.C.¹, RODRIGUES J.^{1,2} ¹*Dpt. Ciências Veterinárias, Univ. de Trás-os-Montes e Alto Douro, Vila Real,* ²*CECAV Portugal, fbrito@utad.pt*

Farming rabbits under intensive system type "Baticlair" is not well studied, in terms of internal environmental conditions, as the concentration of ammonia. In this paper we studied ammonia as a risk factor for rabbits farming intensively in facilities of this type. A prospective study was developed in four exploitations (X1, X2, X3 and X4) of the type "Baticlair". The quantification of the exploitations environmental parameters was based on ammonia concentration. A total of 9 rabbit lungs were examined. Ammonia concentration media values for each exploration were: X1=2.5 ppm; X2=2.75 ppm; X3=4.35 ppm; X4=5.5 ppm.

Nutrition

EFFECT OF SOURCE OF CARBOHYDRATE ON CAECAL PARAMETERS AND MICROBIAL NITROGEN RECYCLING IN GROWING RABBITS. BELENGUER A, BALCELLS J., FONDEVILA M., LÓPEZ C. *Dpt. Producción Animal y Ciencia de los Alimentos, Fac. Veterinaria, Zaragoza, Spain.* balcells@unizar.es

Thirty-two growing male rabbits were used to study the dietary effect of the source of fibre on caecal parameters and microbial nitrogen absorption. Diets were formulated with two sources of fibre, alfalfa hay (AH) and sugar beet pulp (SBP), at different proportions. Microbial N absorption was estimated by caecotrophes collection (neck collar) and by microbial ^{15}N -lysine incorporation. SBP stimulated microbial activity in the caecum, as indicated by a higher volatile fatty acid concentration, a lower pH and higher amino acid ^{15}N -enrichments. AH seems to induce a higher caecal turnover and no effect of the type of fibre on microbial N absorption was observed, but differences among estimation procedures occurred, being values of microbial N recycling from caecotrophes collection (0.52 g/d) much lower than those derived from microbial ^{15}N -lysine incorporation (1.03 g/d).

EFFECT OF THERAPEUTIC ANTIBIOTIC INCLUSION ON THE DIGESTIBILITY OF FATTENING RABBIT DIETS. NAVARRETE C., MARTÍNEZ E., RÓDENAS L., MOYA V.J., PASCUAL J.J., BLAS E., CERVERA C. *Inst. de Ciencia y Tecnología Animal, Univ. de Valencia, ccervera@dca.upv.es*

The effect of dietary addition of 3 antibiotics at therapeutic levels (Neomicine (308 ppm), Oxitetraciline (200 ppm) y Tiamulin (50.4 ppm)) for Epizootic Rabbit Enteropathy control on the digestibility coefficients was evaluated in a *in vivo* trial with 58 fattening rabbits. Feed intake decreased with the medicated diet (-13 g DM/day). In spite of this lower feed intake, digestibility values were lower for medicated than for no-medicated diet ($P < 0.0001$; 56.5% vs 60.1% for DM, 57.4% vs. 61% for Organic Matter, 65.8% vs. 67.9% for CP and 55.7% vs. 61.6% for Crude Energy, respectively), being the greatest differences for the fibre fractions (28.8% vs.

38.6% for NDF and 22% vs. 31% for ADF, respectively), suggesting a lower cecal activity of fattening rabbits with these medicated combinations.

THE USE OF PALM FATTY ACID DISTILLATE AND FISH OILS IN FATTENING RABBIT DIETS. NAVARRETE C., MARTÍNEZ E., RÓDENAS L., MOYA V.J., PASCUAL J.J., BLAS E., CERVERA C. *Inst. de Ciencia y Tecnología Animal, Univ. Politécnica de Valencia.* ccervera@dca.upv.es

The effect of type of dietary fat on the performance of fattening rabbits was evaluated in 263 fattening rabbits. The fat was included at 3% of diet and a palm fatty acid distillate (saturated fat), a hydrogenated palm fatty acid distillate (very saturated and high *trans* fat) and two fish oil (n-3 polyunsaturated oils) were evaluated. Feed intake and live weight gain decreased ($P < 0.001$) with fish oil diets (-16 g DM/day and -3.5 g/day, respectively), specially with one of the fish oil evaluated and during the last week of fattening.

DIGESTIBLE FIBRE TO ADF RATIO AND STARCH LEVEL IN DIETS FOR GROWING RABBITS. FRAGKIADAKIS M.¹, CARRARO L.¹, TROCINO A.¹, XICCATO G.¹, RADAELLI G.² ¹*Dpt. Sci. Animali, Univ. di Padova, Fac. di Agraria, Legnaro, Italia.* gerolamo.xiccato@unipd.it. ²*Dpt. Sci. Sperimentali Veterinarie, Univ. di Padova, Fac. di Medicina Veterinaria, Legnaro, Italia*

To evaluate the effect of digestible fibre (DF; hemicelluloses+pectins)/ADF ratio (1.0 and 1.3) and starch level (12, 15, and 18%) on health, digestive physiology, growth performance, and carcass traits, 246 rabbits weaned at 27 d were fed until slaughter (76 d) with six diets formulated according to a bifactorial arrangement (2 DF/ADF ratios by 3 starch levels). Increasing DF/ADF improved DM digestibility ($P < 0.01$), but did not affect growth performance, caecal content characteristics and slaughter traits. Increasing starch level improved DM digestibility and feed efficiency ($P < 0.001$), decreased linearly ileal mucosa villi height ($P = 0.04$), without affecting growth performance, caecal fermentation and slaughter results. The increase of DF/ADF ratio tended to reduce

mortality (25.0 vs 17.6%; $P=0.11$), whereas the raise of starch greatly increased mortality (6.9 to 43.1%; $P<0.001$) and sanitary risk (13.9 to 63.9%; $P<0.001$).

ENERGETIC RESERVES MOBILIZATION AND SERUM LEVELS OF PROTEINS AND FREE FATTY ACIDS IN REARING DOE RABBITS FED WITH DIFFERENT FEEDINGS PROGRAMMES.

NICODEMUS¹ N.^{*}, SCHWARZ¹ B.F, MILLÁN² P. PEREDA¹ N., ARIAS-ÁLVAREZ² M., GARCÍA-GARCÍA² R., LORENZO² P.L., REBOLLAR¹ P.G. ¹Dpt. Prod. Animal, ETSIA, Univ. Politécnica de Madrid, *nuria.nicodemus@upm.es*. ²Dpt. Fisiología Animal, Fac. de Veterinaria, Univ. Complutense de Madrid, *pilar.rebollar@upm.es*

Thirty six New Zealand x Californian rearing rabbit does were fed, since 11 weeks of age until the first parturition, with three treatments: a control diet, containing a 38% NDF (on dry mater basis), offered ad libitum (AL) or restricted (150 g/d; R) and a high fibrous diet (49.5% of NDF, on dry mater basis; AL-F) offered ad libitum. Both diets had the same digestible protein/digestible energy content (11.6 g/MJ). After the first parturition all groups were fed ad libitum with the control diet. The bioelectrical impedance (BIA) technique was used to estimate body composition and plasmatic NEFA and total proteins were measured at 11 weeks, first insemination (16 weeks for AL group and 17 weeks for AL-F y R groups), 24 h before the parturition, second insemination (11 days post-partum) and at 21 days of the first lactation. The rabbit does fed the fibrous diet tended to reduce their body fat mobilization between the parturition and the second insemination (26%) in relation to the other two groups (54 y 58% for AL y R treatments, respectively), which could explain the higher fertility in the second insemination observed in this group (72.7 vs 50.0 y 59.1%, for AL and R treatments, respectively; $P = 0.05$). However, in this period, rabbit does of the AL-F group reduced by 4% the total protein content, while in the AL and R groups increased by 22 and 6,2%, respectively. It was not found differences in the levels of NEFA among treatments.

PROTEIN AND AMINO ACID DIGESTIBILITY OF CEREALS AND THEIR BYPRODUCTS IN RABBITS. LLORENTE A.¹, VILLAMIDE M.J.¹, GARCÍA-RUÍZ A.I.², CARABAÑO R.¹ ¹Dpt. Prod. Animal, ETSIA, U.P.M. Madrid. ²Nutreco Poultry and Rabbit Res. Centre, Toledo. *ai.garcia@nutreco.com*

The objective of this work was to determine the ileal (apparent and true) and faecal digestibility of protein and amino acids of wheat and corn and two byproducts (wheat middling and gluten feed). Four diets were formulated to contain 40% of each cereal and 35% of each byproduct. The other components varied in order to maintain the level and type of fibre and the level and protein in the experimental diets and in consequence the endogenous losses. The diets were offered ad libitum to the animals (a minimum of 8 adult cannulated (terminal ileum) per treatment) and ileal and faecal digestibility were determined. The true ileal digestibility (TID) of protein in the wheat was the highest (89.1%) and higher (11 points) than that of corn. This tendency was similar between cereals byproducts but the differences were lower (6 points) than that observed between grains. The TID of protein and amino acids of wheat were higher (between 1 and 7 points) than that for wheat middling. Similar results were observed when corn and gluten feed were compared, except to Threonine that showed higher ileal digestibility in the gluten feed than for corn. The use of apparent units (ileal or faecal) lead to an under evaluation of digestive efficiency of protein and amino acids of the raw materials studied.

EFFECT OF THE DIETARY INCLUSION OF GLUTAMINE AND ARGININE ON THE MORTALITY AND INTESTINAL BARRIER IN WEANED RABBITS. CHAMORRO S.¹, CARABAÑO R.¹, GRANT G.², GARCÍA J., DE BLAS C.¹ ¹Dpt. Prod. Animal. ETSIA, UPM. Madrid. ²Rowett Res. Inst. Gut and Immunology. Bucksburn. Aberdeen. Scotland, UK. *susana.chamorro@upm.es*

The aim of this work was to study the effect of the supplementation with glutamine and arginine on the intestinal barrier and mortality in rabbits weaned at 25 days, in a farm affected by Epizootic Rabbit Enteropathy (ERE). A control

diet (C) and two additional diets with similar composition to C but supplemented with 1% of glutamine (GLU) and 1% of glutamine and 0.5% of arginine (GLU+ARG) were formulated. A mortality trial was carried in 119 rabbits per diet, which were fed the experimental diets the first two weeks after weaning and thereafter received a commercial diet until 56 days of age. The morphology and N-aminopeptidase activity of the jejunum was studied in eight animals per diet at 35 days of age. The supplementation with glutamine or arginine did not affect neither the morphology nor the activity of N-aminopeptidases of the jejunum. The supplementation with glutamine reduced ($P<0.05$) the mortality both in the starter period (from 25 to 39 days of age) and during the whole fattening period, by 55% and 28% respectively.

PERFORMANCE, SERUM INNATE AND DIGESTIVE MUCOSAL IMMUNITY OF YOUNG RABBITS FED DIETS SUPPLEMENTED WITH ZINC BACITRACINE OR PROTECTED ORGANIC ACIDS. REBOLLAR P.G.¹, CARDINALI R.², MOSCATI L.³, BATTISTACCI L.³, SCICUTELLA N.⁴, DAL BOSCO A.² CASTELLINI C.² ¹Dpt. Prod. Animal, ETSIA, Univ. Politécnica de Madrid, pilar.grebollar@upm.es. ²Dpt. BVBAZ, Univ. de Perugia (Italy), Fac.de Agraria, Perugia. rcardinali@inwind.it. ³IZS Umbria e Marche, Perugia. moscati@izsum.it. ⁴SODA Feed Ingredients, Monaco. nicola.scicutella@soda-ingredients.com

The supplementation of diets fed for young rabbits with organics acids can be a good alternative to antibiotics. The aim of this study was to know their effect on the innate immunity and on the lymphoid tissue associated to intestine. A total of 120 young weaned rabbits (27 days) were distributed into three groups: a control group fed till 65 days of age with a control diet (ED 105 Mj/Kg; PB 178 g/kg; E.E. 27 g/kg), a second group fed with the same diet supplemented with 150 ppm of Zinc Bacitracine and a third group fed with FormaXol™ (blend of microencapsulated Ca formate, citric acid along with essential oils) at 0.4%. Finally, in the period 65 - 80 days of age, the antibiotic was removed in the second group whilst in the third group, AciXol™ (blend of microencapsulated fumaric, citric, orthophosphoric, malic acids along with

essential oils) at 0.1% was added in replacement of FormaXol™. Performance was similar between groups, but mortality was higher in control group, being intermediate in FormaXol™ group. Serum innate immunity parameters indicated a good immune response and it could be related to subclinical disease. Histological studies showed a normal lymphoid tissue development in accordance to age of animals and similar between groups. Marked villi shortening and erosive mucosa aspect in accordance to lesions produced in response to virus or bacteria were observed. However, in both periods, animals fed with diets containing the blends of protected organic acids along with essential oils allowed to achieve better values of villi height ($P<0,05$) than control group and similar to the diet supplemented with bacitracine, indicating that their integration could be a good alternative to antibiotics in weaned rabbit diets.

Pathology

EFFECT OF THE MYXOMATOSIS VIRUS IN THE REPRODUCTIVE TRACT OF THE FEMALE RABBIT. PAGÈS-MANTÉ A.¹, MAJÓ N.² ¹Lab. Hipra, Amer, Girona. apm@hipra.com. ²CRESA- Centre de Recerca en Sanitat Animal, Univ. Autònoma de Barcelona. Bellaterra, Barcelona

The aim of this experimental study was to determine the effect of the Myxomatosis virus (MV) in the reproductive tract of the female rabbit. To carry on the study 4 first gestation does and 5 pluriparous does, free of MV antibodies, were infected with MV Lausanne strain by intravaginal route. One first gestation doe was inoculated by intradermic route as a virus control. Two does ,one first gestation and one pluriparous, were inoculated by intravaginal route with PBS , as negative controls .All the does were allocated in separated cages into a P3 bio security level with *ad libitum* access to water and commercial rabbit feed. Each doe was inspected daily to detect clinical signs of MV. At 7 and 15 days post-infection (p.i) the does were humanely sacrificed in order to detect macroscopic and microscopic lesions of MV in the reproductive tract and MV antigen by immunohistochemical technique and PCR. The

virus control doe was sacrificed at 9 days p.i with clear signs of MV. We were neither able to detect MV lesions by histology nor MV antigen by immunohistochemical technique in the reproductive tract of the inoculated does. Only one pluriparous doe was positive to PCR

ISOLATION OF TRICHOPHYTON MENTAGROPHYTES AND MICROSPORUM GYPSEUM IN RABBITS. COELHO A.C.¹, CAMPO M.N.¹, CARVALHO A.², PINTO M.L.¹, COELHO A.M.³, RODRIGUES J.^{1,4} ¹Dpt. C. Veterinárias, Univ. de Trás-os-Montes e Alto Douro, Vila Real, ²NANTA, Portugal. ³Direcção Regional de Agricultura de Trás-os-Montes, Mirandela; Portugal. ⁴CECAV Portugal. accoelho@utad.pt

Dermatophyte infection or ringworm is a zoonosis with a great impact in Public Health. During a period from 2006 and the beginning of 2007, dermatophytes were identified from rabbit sample cultures submitted for mycological examination, in the Laboratory of Microbiology in the University of Trás-os-Montes e Alto Douro, Vila Real, Portugal. Dermathophytes were cultured from 12 of 18 (66.7%) specimens. The dermathophyte isolated were *Trichophyton mentagrophytes* var. *mentagrophytes* (6, 33.3%) and *Microsporum gypseum* (6, 33.3%). Zoonotic potential of these isolates need to be consider in the epidemiology of human dermatophytosis in the region.

ANALYSIS OF PARAMETERS IMPLICATED IN RESPIRATORY PATHOLOGY IN POPULATIONS OF RABBITS. VIEIRA-E-BRITO¹ F., FONSECA¹ M.I., VIEIRA-E-BRITO¹ M.G., COELHO¹ A.C., RODRIGUES^{1,2} J. ¹Dpt. C. Veterinárias, Univ. de Trás-os-Montes e Alto Douro, Vila Real Codex, ²CECAV Portugal. fbrito@utad.pt

The aim of this study was the quantification of the environmental parameters with influence on rabbits respiratory pathology. In this paper, a prospective study was developed in five rabbits exploitations. The quantification of the exploitations environmental parameters was based on gases (ammonia, carbon monoxide, carbon dioxide, hydrogen sulfide). A total of 15

rabbit lungs and livers were examined. In this study was observed a relationship between a higher concentration of gases in the exploitation and the occurrence of lung lesions and the isolation of etiological agents of respiratory pathology.

PATHOLOGICAL STUDY ON NATURAL STAPHYLOCOCCAL CHRONIC MASTITIS. VIANA, D.; ORTEGA J, SELVA, L.; SEGURA, P. Y CORPA, J.M. Dpt. Atención Sanitaria, Salud Pública y Sanidad Animal. Fac. C. Experimentales y de la Salud, Univ. CEU-Cardenal Herrera, Moncada (Valencia), Spain.

Staphylococcus aureus cause substantial economic losses in livestock industry worldwide. In rabbits this bacteria infects dermal lesions and invades subcutaneous tissues causing different lesions. The inflammation of the mammary gland is the main culled cause of adult does from rabbitries. However a scarcity of scientific reports exists focussed on the study of staphylococcal mastitis in rabbits. The aim of this work is to describe the macro and microscopical lesions observed in natural cases of chronic mastitis associated to *S. aureus* infection in industrial rabbits.

PREVALENCE OF PATHOLOGIES IN RABBITS FARMING UNDER INTENSIVE MANAGEMENT. CAMPO M.N.¹, COELHO A.C.¹, CARVALHO A.², PINTO M.L.¹, COELHO A.M.³, RODRIGUES J.^{1,4} ¹Dpt. de C. Veterinárias, Univ. de Trás-os-Montes e Alto Douro, Vila Real Codex. ²NANTA, Portugal. ³Direcção Regional de Agricultura de Trás-os-Montes, Mirandela; Portugal. ⁴CECAV Portugal. accoelho@utad.pt

A descriptive observational and transversal study was conducted with a convenience sample of 28 exploitations. Between September and December of 2007 all pathologies were recorded. The pathologies with high values of prevalence were digestives (28.6%), respiratory system (25.0%), skin (25%), and of unknown aetiology (25%). These results are in agreement with previous studies that found that digestive problems were the most prevalent pathologies in the rabbit's exploitations.