

**ABSTRACTS OF THE 39TH SYMPOSIUM ON CUNICULTURE, ASESCU
TUDELA, SPAIN, 29TH-30TH MAY, 2014**

The 39th Congress of the Spanish Association of Cuniculture (ASESCU) was held in Tudela from 29th to 30th of May 2014. The main papers were related to analysing the current situation of the rabbit sector in the Navarra region, problems related with marketing and opening new markets for rabbit meat, production costs in rabbit farming, producer organisations and growth performance in crossbred rabbits, as well as the partnership between the Spanish Institute of Agricultural Research (INIA) and the rabbit marketing board (INTERCUN) to support research projects. In addition, 2 round tables were held on the role of producer associations in the development of rabbit farming and the risks of medication dependency. Moreover, a total of 25 communications were presented both in working sessions with oral communications and posters (pathology, technical-economical management, nutrition, reproduction, management and welfare, and consumer behaviour). The meeting was attended by more than 190 participants, including researchers from Spain, Portugal, France, Ecuador, Brazil and Egypt. The abstracts of the contributions presented are reported below.

TEHCNICAL-ECONOMICAL MANAGEMENT

TECHNICAL MANAGEMENT INDEXES IN RABBIT PRODUCTION

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The main technical management indexes in cuniculture, the factors affecting them, the methodology of calculation in the bdcuni system and the averaged results obtained in the farms during 2013 are exposed. bdcuni is a free and confidential management system on line (www.ivia.es/bdcuni), where farmers can obtain their technical and economic results and compare them with the averaged values obtained in other farms. Fertility at kindling was 77.1%, with a standard deviation (s.d.) of 6.9. The 10% of the farms with the lowest value had a maximum of 68.3%, and the 10% with highest value had a minimum of 83.7%. Lactation mortality was 12.1% (s.d.=4.7; Low=7.8%; High=19.3%) and fattening mortality remained at 7.9% (3.5%; 3.9%; 11.1%). Kits born alive per kindling averaged 9.39 (0.71; 8.40; 10.07) and market liveweight was 2158 g (124; 2033; 2295). The replacement rate stayed at 102% (26; 68; 127) and feed conversion rate was 3.64 (0.65; 3.11; 4.19).

INFLUENCE OF THE EXTENSION OF REPRODUCTION RHYTHM AND WEANING AGE ON PRODUCTIVITY AND THE ECONOMIC RESULTS OF RABBIT FARMS

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The aim of this study was to assess the effect of the extension of the kindling-mating period, and the subsequent lactation length, on different production traits, as well as on revenue statements. Performance from 245 births mated 11 d after parturition (RR-11) was compared to 122 births mated 32 d after parturition (RR-32); these 2 reproductive rhythms were associated to 31 and 56 d of lactation, respectively. Performance was characterised based on doe weight at mating and at parturition, doe fertility and prolificacy, as well as on lactation kits growth and after weaning. Results showed a slightly positive effect of extending kindling-mating interval ($P<0.05$) on litter weight at birth (+89.1 g), on kit average daily gain after weaning (+2.1 g/d), on weight at 60 d (+79.5 g) and female fertility (+6.5 percentage units). No differences were found in prolificacy and rate of mortality during the fattening period. The positive effect of the extension of the lactation period on kit growth is counterbalanced by the negative effect of the reduction of the number of litters per female and year, consequence of the extension of the kindling-mating interval. Thus, the

global economic indexes, 9.5% Income Over Feed Costs (IOFC) and 10.3 net present value (NPV) were higher for RR-11 than for R-36.

PATHOLOGY

EVALUATION OF THE FIRST AUTOGENOUS VACCINES APPLIED IN RABBIT FARMS AGAINST RINGWORM

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Dermatophytosis is a fungal infection affecting the keratinised superficial tissues of humans and animals. Ringworm in rabbits is caused mainly by *Trichophyton mentagrophytes* and has a high prevalence in commercial farms, mainly affecting fattening rabbits in which growth retardation occurs, worsening the conversion rate and fur depreciation. Immunisation with live attenuated vaccines has proven very effective for the control of ringworm in some animal species, including rabbits. However, the absence of commercial products makes the use of inactivated autogenous vaccines almost the only option for its control in Spain. In the present study, the results of the first autogenous vaccines applied in commercial farms are shown. The application of ringworm autogenous vaccines in does is a very useful tool for disease control in does, suckling and fattening rabbits, mainly in those farms which work all-in-all-out.

CHARACTERISATION OF *STAPHYLOCOCCUS AUREUS* STRAINS LACKING VIRULENCE GENES

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Staphylococcus aureus is an opportunistic pathogen, causing frequent infections in humans and in different

livestock, leading to economic losses. The pathogenicity of this bacterium is caused by its ability to produce more than 30 virulence factors and the different combinations that can occur among them. These virulence genes are highly modulated by global regulatory systems called "two-component systems" (TCSs). *S. aureus* genome contains at least 16 pairs of TCSs, although the specific role of most of them has not been thoroughly described. Therefore, mutant strains lacking two-component systems were constructed, and their ability to avoid the host innate response was studied by *in vitro* and *in vivo* models. The results revealed that the mutant strain lacking TCS5 (GraRS) was more susceptible to the innate response of the host, achieving mortality rates of around 100% after 1 h of incubation, both in whole blood and in presence of nisin. These *in vitro* results were related to an *in vivo* experimental infection of 24 rabbits, where the TCS5 deficient strain (GraRS) was not able to cause a lesion in any of the animals, nor survive within the host skin after 7 d post-inoculation. These results suggest that the TCS5 (GraRS) is essential in order to counteract the innate response of the rabbit and cause infection.

LONGITUDINAL STUDY OF NASAL COLONISATION BY *STAPHYLOCOCCUS AUREUS* IN RABBITS

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Staphylococcus aureus nasal colonisation plays a critical role in the pathogenesis of staphylococcal infections. In human medicine *S. aureus* eradication from the nares has proven to be effective in reducing endogenous infections. Previous studies from our group described nasal carriage rates of 56% in rabbit farms with chronic staphylococcal problems. Moreover, it was shown that the strains isolated from nose and injury were genetically related in 91.7% of animals, thus suggesting the possible nasal origin of disease, while not being able to rule out the opposite path, in which some animals suffer injury and subsequently acquire the nasal carriage. For a better understanding of nasal colonisation of *S. aureus* in rabbits and its relationship to disease, a longitudinal study was conducted, sampling the nasal mucosa of rabbits after entry to the farm for a period of 6 mo.

THE EFFICACY OF DICLAZURIL AND ROBENIDINE AS COCCIDIOSTATS ON GROWTH PERFORMANCE OF FATTENING RABBITS

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The efficacy of Diclazuril and Robenidine as coccidiostats was evaluated on mortality and performance of growing rabbits. A total of 120 crossbred (New Zealand White×Californian) rabbits 32 d old, weighing 711 ± 101 g (mean±standard deviation), were distributed in randomised blocks to 3 treatments. A control diet was formulated without coccidiostats (T1), another one adding 1 ppm of Diclazuril (T2) and a third one adding 66 ppm of Robenidine (T3). Growth traits were controlled at 32, 46, and 60 d. Oocyst output was measured at the end of the productive period. During 32-46 d, the animals fed with T2 and T3 showed a higher average feed intake (7%; $P < 0.001$) and daily gain (3.45 g; $P = 0.013$) than those fed with T1. As a consequence, these rabbits also had a higher body weight (3.8%; $P = 0.013$) in this phase. Nevertheless, in the second period (46-60 d) the animals fed with coccidiostat showed a compensatory growth. Their daily gain was 3.75 g ($P = 0.01$) higher than that of the others. In addition, the use of coccidiostats reduced the output of faecal oocysts by 63% and agrees with the lower mortality observed during the second period of fattening in rabbits fed with these feeds (4.4 vs. 14.4%; $P = 0.025$). This study suggests the importance of using coccidiostats during the first 14 d after weaning to control mortality in the second period of fattening.

MICROBIOLOGICAL CHARACTERISTICS OF WATER IN RABBIT FARMS IN NORTH-EASTERN PORTUGAL

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This work presents results on a preliminary study of the microbiological quality of water in rabbit farms in north-east Portugal. The results of the analysis of 12 water samples from 12 farms were negative for the presence of total coliforms, faecal coliforms (*Escherichia coli*) and faecal streptococci (*Enterococcus* spp.). In all samples, the total number of microorganisms at 22°C were <100 CFU/mL and at 37°C were <10CFU/mL. The results of this study showed a high microbiological quality of water consumption of rabbits from farms in the sample.

However, the small number of farms must be taken into consideration and the samples must also be taken inside the farms.

REPRODUCTION, MANAGEMENT AND WELFARE

HANDLING AND HEALTH OF LACTATING DOES RELATED TO CAGE DESIGN

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The effects of cage design on handling and health of 64 rabbit does during the first lactation were compared. The B cage was higher and provided with a platform, whereas the C cage had only one plane. The workers spend 11% more time to manipulate lactating animal allocated in B cages, 14% more during the first week of lactation and 25% when they are not experts. Rabbit does did not refuse lactation in any case, but 21% of does showed aggressive behaviour during handling in B cages vs. 13% in C cages. Sanitary condition in B cages were worse ($P < 0.001$) and 38% of rabbit does showed symptoms of sore hocks at weaning versus 3% in C cages.

VARIATION OF FEED BEHAVIOUR OF DOES ASSOCIATED TO CAGE TRANSFER DURING LACTATION OR GESTATION

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Live weight, daily milk yield and feed intake of 54 lactating does and 28 pregnant does were measured in 2 periods, from 22 to 28 d of lactation (L period) and from 17 d of gestation to 7 d post-partum (G period). Litters and mothers were separated at 21 d post-partum. L1 does remained in the cage of lactation and litters occupied another cage; L2 does were transferred to another lactation cage and L3 does were transferred to a small cage. After weaning, pregnant does from L1 and L2 groups were distributed into 2 groups; G1 does remained at the lactation cage and G2 does were allocated to small cages from 17 to 28 d of gestation. Milk yield and litter performance were not affected by experimental design, but the removal of lactating does decreased feed intake (-5%), especially when small cages were used (-9%), with a loss of live weight (-11 g/d). The

same effects of small cage were recorded with pregnant does, with lower feed intake (-13%) and lower live weight increase from 17 to 21 d (-35%), although similar values of live weight increase were recorded at the end of pregnancy (19 g/d). The worse results recorded when small cages were used could be caused by the limited area available for the animal, related with behavioural changes and welfare problems.

EFFECT OF DIFFERENT WEANING AGE AND TYPE OF CAGE ON REPRODUCTIVE AND GROWTH PERFORMANCE OF DOES, KIDS AND FATTENING RABBITS

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In the present experiment, the effects of the use of long lactation periods with alternative cages on the reproductive and growth performance of 104 rabbit does and their litters during five consecutive reproductive cycles were studied. Half the does were housed in conventional polyvalent cages (39×100×30 cm) and the other half in alternative polyvalent cages (39×100×60 cm), with a raised platform. Half of the rabbit does in each type of cages were weaned at 32 and the other half at 46 d after parturition. Weaning age: late weaning negatively affected body weight ($P<0.001$), fat and energy content ($P<0.05$) of rabbit does at the end of the lactation period. Fertility, prolificacy and doe mortality were not affected by lactation length. Late weaning led to lower mortality (12.6 vs. 17.6%; $P<0.01$), higher litter weight (by 11.3%) at the end of growing period and lower feed conversion ratio per cage during the overall experimental period (13.5%) than weaning at 32 d ($P<0.001$). Type of cage: at day 21 litter weight and feed conversion ratio between 3 and 21 d were 4.2% higher ($P<0.01$) and 5.0% lower ($P<0.05$) in animals housed in alternative than in conventional cages. Alternative cages also led to heavier litters at 59 d ($P<0.01$). From the results obtained, it may be concluded that the combined use of longer lactations and cages with higher available surface with a raised platform could be an alternative to improve animal welfare in productive situations with high sanitary risk, enhancing growing performance.

MILK PRODUCTION AND LITTER WEIGHT IN DIFFERENT RABBIT LINES

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The objective of this study was to compare 3 Spanish maternal rabbit lines (A, V and LP) in terms of milk yield and composition and for litter weight during lactation. A total of 194 mature does in their third or higher parity were used. The milk yield was recorded at 1, 2, 3, 4, 8, 9, 10, 11, 15, 16 and 17 d post-partum (dpp). The traits studied were weekly milk yield (WMY; g/wk) at the first 3 wk of lactation and litter weight at the same periods. The milk composition traits studied were fat (%), protein (%), ash (%), lactose (%) and total solids (%). The milk samples to be analysed were collected from each doe at 18 dpp. Data were analysed using single trait mixed and fixed models with and without covariates; the covariates were number born alive (NBA) and doe weight at kindling (DW). Total milk yield up to 21 dpp was 4241±89, 4556±78 and 5116±80 g for lines A, V and LP, respectively. Least-square means of litter weight for line A at the 3 wk were 874±9, 1629±13 and 2231±27 g, respectively, for line V were 970±8, 1776±11 and 2506±23 g, and for line LP were 982±8, 1974±12 and 2864±24 g. Overall means of fat, protein, ash, lactose and total solids (%) were 14.62±0.17, 11.10±0.07, 1.89±0.04, 2.67±0.12 and 30.27±0.24, respectively. The differences between lines for milk production traits were significant, while the differences between lines for milk composition traits were not significant. NBA had significant effects on all milk yield traits but had no significant effects on milk composition traits. DW only had a significant effect on weekly milk yield. The parity order had no significant effect either for milk production traits or milk composition traits, except for ash %.

CONSEQUENCES OF ROBUSTNESS AND CULLING CRITERIA OF RABBIT DOES ON PRODUCTIVITY OF A COMMERCIAL FARM

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In Spain, 2 thirds of rabbit females starting their productive life are culled due to disease or low performance. However, there are few studies showing how and when it is worth removing a rabbit doe solely based on its productive performance. In order to generate information on how to improve the culling criteria, the productive lifespan

of 991 rabbit females was monitored. A strong positive relationship between the number of parities and females' productive performance was established. Parallelism between productive performance and culling by fertility was also established. Simulations on the consequences of using stringent criteria were also performed. Results suggest that using a very highly exigent, but parity-dependent criteria, may not guarantee better results.

PERFORMANCE OF GROWING RABBITS IN ENRICHED CAGES

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The aim of this work was to study the productive performance of growing rabbits subjected to cage enrichment. Rabbit growth comparisons between control and enriched cages were carried out. 180 rabbits (New Zealand×Californian), of both sexes, which were controlled from day 35 (weaning) until day 70 (slaughter age) were used. Significant differences were observed in average daily gain of rabbits aged between 49 and 63 d, in which we obtained better results than for the animals with enriched environment. For live weight, average daily intake and feed efficiency, no significant differences were observed. The environmental enrichment did not improve the growing performance of rabbits.

USING INFRARED-THERMOGRAPH IMAGING TO EVALUATE THE TEMPERATURE OF RABBIT NESTS WITH DIFFERENT MATERIAL

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In this study, infrared-thermograph (IRT) images were used to assess the nest temperature of young rabbits. Nests with wood chips and straw were compared. IRT images were obtained in 80 nests and 66 nests with wood chips and straw, respectively. Temperature determinations were performed at 54 points in each image. Information was obtained for minimum, maximum, mean, central and peripheral nest temperatures. There was no difference ($P>0.05$) in peripheral and minimum temperatures between both types of nest material. However, for nests

with wood chips the maximum, average and central temperature were higher ($P<0.05$) than the temperature observed in straw nests. The IRT technique shows potential to evaluate the temperature of the nests of young rabbits and the wood chips allows warm nests.

BODY WEIGHT GAIN ON RABBIT DOES OF DIFFERENT AGES DURING LACTATION PERIOD

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In this study, 205 rabbit does were used to determine the change in body weight during lactation according to their age. The rabbit does were divided into 3 groups; young (74) up to 8 mo old, adults (96) aged between 9 and 16 mo, and older (35) with more than 17 mo of age. The animals were weighed at 2, 7 and 32 d of lactation and body weight variance and weight gain were studied. The average body weight was significantly influenced by the age of the does on all weighing dates. On days 2 and 7 of lactation, the weight of young does (4142 and 4364 g) was on average 300 g less than that of the adult and old does, which showed no differences between them. At weaning, the only significant difference was found between the mean body weight of young and adult does (4539 vs. 4827 g). For the average daily gain, no significant differences were observed between groups.

NUTRITION

EFFECTS OF A MALTANEDIOL AND FUCOSTEROL HIGH CONTENT ALGA EXTRACT ON THE ZOOTECHNICAL PERFORMANCE AND NUTRITIONAL CHARACTERISTICS OF THE MEAT OF RABBITS RECEIVING AN ALPHA-LINOLENIC RICH FEED

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During 7 experiments carried out between 2008 and 2012, 2812 rabbits were split between a control feed and a feed containing 1 kg of a brown algae extract with a high level of maltanediol and fucosterol in order to evaluate its effects on mortality, growth and meat composition. Between the weaning and 56 d, the algae extract decreased the mortality of 1.2% ($P=0.01$) and significantly increased the growth of 1.7 g/d. But a contrary trend is observed between 56 and 70 d. The total omega 3 and alpha-linolenic acid (ALA) levels are increased in the meat of the rabbits receiving the algae extract, while the saturated fatty acid level remains practically constant. Consequently, the nutritional value of this meat is increased. Expressed in mg/100 g of meat, the omega 3, ALA and docosahexaenoic acid (DHA) are increased from 18 to 25% for the rabbits receiving the algae extract.

EFFECT OF LEVEL OF SOLUBLE FIBRE AND Ω 3 FATTY ACIDS ON THE PERFORMANCE OF RABBIT DOES AND THEIR LITTERS DURING THE FIRST TWO LACTATIONS

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The effects of dietary levels of soluble fibre (SF), Ω -3 fatty acids and their interactions on the performance of rabbit does and kits were studied. To this end, diets were formulated according to a 2x2 factorial design with 2 levels of SF (8.2 vs. 10.5% dry matter) and two Ω -3 fatty acid concentrations (3.6 vs. 13.5 g/100g of total fatty acids). The 4 diets, low in SF and Ω -3 (BFB Ω 3), low in SF and high in Ω -3 (BFA Ω 3), high in SF and low in Ω -3 (AFB Ω 3), and high in SF and Ω -3 (AFA Ω 3) were fed to 88 nulliparous does (22/diet). Litter growth rate was recorded from birth to weaning (0, 20 and 25 d) and milk production was recorded daily. An increase in dietary SF reduced feed intake during the first gestation by 12% ($P=0.020$). However, during lactation an interaction between the 2 factors was observed ($P=0.045$), with higher feed intake observed in does fed the Ω 3 in the low SF diets, but no such effect on those fed the high SF diets. This higher feed intake resulted in increased milk production, litter growth rate and higher litter weight at weaning. A significant lower kit mortality during lactation was observed in does fed the AFB Ω 3 diet compared to those fed the AFA Ω 3 diet, while those fed the low SF diets ($P=0.046$ for the interaction) showed similar mortality. Treatments did not influence the combined feed efficiency of doe and litter. The increase of Ω 3 fatty acids tended to

increase the kits born alive ($P=0.13$) and the initial number of kits once the litters were standardised ($P=0.007$).

EFFECT OF THE SOURCE AND LEVEL OF LIGNIN ON PERFORMANCE AND CARCASS CHARACTERISTICS IN GROWING RABBITS

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The aim of this work was to study the effect of including different levels of acid detergent lignin (ADL) in diets using 2 sources of lignin (Arboce[®] vs. defatted grape meal) on performance and carcass characteristics in growing rabbits. Five different feeds were formulated: one control diet with a 5% ADL/dry matter (DM), and another four diets with a medium (6%) and high (7%) ADL/DM level for each source, respectively. A total of 936 rabbits weaned at 35 d of age were used, 216 were housed in individual cages and the remaining 720 were housed in collective cages (5 animals/cage). Weight and intake were measured at the beginning and at the end of growing period (35 and 60 d of age). At the end of the trial, 24 rabbits per treatment were slaughtered and the carcass weight, the entire digestive tract, the full and the empty stomach and full caecum were measured. For rabbits housed in collective cages, the highest level of lignin impaired feed conversion rate (FCR) (2.70) compared with the medium (2.67) and the lowest levels (2.65; $P<0.05$), without affecting daily feed intake (139 g/d) or daily body gain (52.2 g/d). In the individual cages, the level of lignin did not affect productive performance. The digestive tract and caecum weight (%body weight) decreased ($P<0.052$) with medium and high levels of lignin, compared with the control diet (2.5 and 7.7%, respectively), but carcass yield was not affected (58.2%). The inclusion of Arboce[®] increased FCR in individual and collective housing (2.56 vs. 2.52 and 2.69 vs. 2.65 ($P<0.05$), respectively).

EFFECT OF THE SOURCE AND LEVEL OF LIGNIN ON NUTRIENT DIGESTIBILITY AND RETENTION IN GROWING RABBITS

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The aim of this work was to study the effect of including different levels of acid detergent lignin (ADL) and different sources of lignin (Arbocel[®] vs. defatted grape meal) on digestibility and protein and energy balance in growing rabbits. Five different feeds were formulated: one control diet with a 5% ADL/dry matter (DM), and another four diets with a medium (6%) and high (7%) ADL/DM level for each source, respectively. Between days 53 and 57 d of life, a digestibility trial was carried out (DM, organic matter [OM], crude protein [CP], ether extract [EE], neutral detergent fibre [NDF]; n=11). The balance of nitrogen and energy was calculated for the same 66 animals, using *in vivo* body and carcass chemical composition estimated by Bioelectrical Impedance technique at 34 and 60 d of age. The lowest lignin level improved the faecal apparent digestibility of DM (2.7%), OM (2.5%), CP (2.9%) and GE (2.4%) compared to the other 2 treatments ($P<0.05$). However, EE digestibility increased (3.8%) with ADL inclusion level from 5 to 7% ($P<0.05$). Arbocel[®] source tended to impair DM digestibility (1.4%; $P=0.073$) and impaired OM digestibility (1.4%; $P<0.05$). The increase of ADL and the use of grape seed meal led to a lower digestible N intake and retention efficiency, reducing the urine N excretion.

EFFECT OF DIETARY SUPPLEMENTATION WITH YEAST (*S. CEREVISIAE*), VIT E, OREGANO EXTRACT AND THEIR COMBINATION ON GALT, VILLUS HEIGHT AND CAECAL SWABS IN FATTENING RABBITS; PRELIMINARY RESULTS

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The aim of this study was to analyse the effect of *Saccaromyces cerevisiae*, oregano and vitamin E dietary supplementation on caecal bacteria and Galt evaluation. For this study, 48 weaned rabbits at 30 d of age were randomly allocated to 6 dietary groups (8 rabbits/group) that consisted of a Standard diet (S) without supplementation and another 5 experimental diets supplemented with: 150 ppm Vit E as a positive control (E); 0.2% oregano extract (*Origanum vulgare* L.) (O); 0.15% Thepax (T); 0.15% Thepax+ 0.1% oregano extract

(TO); 0.15%Thepax+150ppm Vit E (TE). The S, E and O treatments were tested in Experiment 1 and the T, TO and TE treatments in Experiment 2. At 80 d of age, 8 rabbits per diet were slaughtered. A 6 cm sample was excised from the jejunum to determine mucosal histology and Peyer patch (PP) and a sample of caecal content was cultured aerobically and anaerobically. In the first trial, the average follicles area of PP was affected by diet ($P<0.05$). Animals fed E diet showed a hypertrophy compared to the animals fed with S and O diets (45% higher). In the second trial, PP average follicles were not affected ($P>0.05$) by treatments. In the second experiment, animals fed T diet showed a lower presence ($P<0.05$) of *Escherichia coli* O103 compared to the other diets (12.5 vs. 60%) respectively. In conclusion, the preliminary results of the present work show that the inclusion of vitamin E, oregano extract and *S. cerevisiae* in growing rabbit diets has an effect on gut architecture and caecal microbiota. Further study with artificial infections should be performed.

REPRODUCTIVE RESPONSE OF RABBIT DOES FED WITH SALMON OIL ENRICHED DIETS

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A total of 136 nulliparous rabbit does were fed *ad libitum* since 10 wk of age with 2 isofibrous, isoenergetic and isoproteic diets supplemented with 2 different fat sources: lard for control diet (C group; n=68) and a salmon oil supplement rich in polyunsaturated fatty acids n-3 (P group; n=68) with an inclusion level of 1.5% (7.5 g/kg) until the first parturition and 3% (15 g/kg) until the second weaning. Body weight and composition were similar between groups throughout the experiment, although supplemented does reduced feed intake when supplementation was increased. Prolificacy, kits' body weight at birth and number of weaned kits were similar between groups. However, in the control animals, the daily gain and body weight average at weaning tended to be higher. Nonetheless, P does showed higher fertility, thus the estimate number weaned kits per doe and year was higher in this group. In conclusion, the increase of polyunsaturated fatty acids n-3 inclusion from 7.5 to 15 g/kg after first parturition decreased feed intake of does, reducing litter growth but having a positive effect on fertility.

PRODUCTIVE AND DIGESTIVE PARAMETERS IN FATTENING RABBITS FED WITH N-3 PUFA ENRICHED DIETS

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The aim of this study was to determine the effect of supplementation with n-3 polyunsaturated fatty acids (PUFA) on growth and digestive parameters in rabbits during the fattening period (30-60 d of age). Two diets differing in fat source were formulated: the control diet (CON) containing lard and the PUFA diet containing an n-3 poly-unsaturated fatty acids supplement from salmon oil. In both diets, fat was included at 7.5 g/kg diet. Each diet was administered to 12 litters with 8 kits each. Daily feed intake (DFI) and average daily gain (ADG) were determined in half of the litters from each treatment, and at the end of the trial 4 rabbits from each litter were slaughtered. In the rest of the litters, 2 rabbits were slaughtered at 30 (weaning), 45 and 60 d of age to analyse caecal fermentation and ileum morphology. There were no differences ($P>0.05$) between diets in DFI, ADG, feed conversion rate, slaughter weight, carcass weight, pH and $\text{NH}_3\text{-N}$ concentration in the caecum or ileum morphology (villus length and crypt depth). Rabbits fed with the PUFA diet had greater ($P<0.001$) concentrations of volatile fatty acids in the caecum at 30 and 45 d of age compared to the control group, and a trend ($P=0.062$) to the same effect was observed at 60 d of age. In conclusion, the replacement of lard with PUFA in the diet did not affect the productive response of rabbits, but stimulated digesta fermentation in the caecum.

IMPACT OF PROBISAN ON PERFORMANCE AND HEALTH OF FATTENING RABBITS

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In 2 trials, we monitored an effect of 0.2% probiotic PROBISAN in the feed on performance and health of fattening rabbits. Based on the results, we can conclude that the enrichment of feed with PROBISAN positively influenced the growth, feed consumption and most carcass indicators of fattening rabbits. PROBISAN had a significant positive effect on the health condition, where in both tests the mortality of rabbits was reduced almost by half.

CONSUMER BEHAVIOUR

PREFERENCES OF YOUNG CONSUMERS FOR JOINTS OBTAINED FROM THE TECHNOLOGICAL DIVISION OF THE RABBIT CARCASS EVALUATED BY PHOTOGRAPHIC IMAGES

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A sample of 405 young people from Andalusia (Spain), aged between 18 and 32 yr and 54.3% women was subjected to 2 tests consisting in scoring of photographic images in order to study i) their preference among hind leg, fore leg, loin and thoracic cage joints obtained from the technological division of the rabbit carcass, and ii) their preference between the loin joint and loin chops obtained by transverse cutting of the raquis. In the first test, the decreasing degree of preference was the hind leg, the loin joint, the fore leg and the thoracic cage ($P<0.001$) in both men and women and whether they were rabbit meat consumers or not. In the second test, loin joint reached a higher score than loin chops ($P<0.001$) for all individuals in the sample, for both sexes and for young people who consume rabbit meat, while non-rabbit meat consumers showed no difference in preference between the 2 presentations ($P> 0.05$). The results illustrate the higher acceptance that young consumers may show for joints of the carcass with higher meat content, suggesting that differences in preference among carcass joints could influence decisions to purchase cuts of rabbit meat.