

Abstracts of the "XXX SYMPOSIUM DE CUNICULTURA DE ASESCU"

Valladolid 18, 19 and 20 May 2005.

More than three hundred delegates participated in the XXX National Rabbit Symposium of the Rabbit Spanish Association (ASESCU), organized by ASESCU and the slaughterhouse of rabbits Hermi. The scientific program consisted of eight sessions of work, where twenty-six speakers participated. In the Symposium questions on food safety, animal production, animal welfare, alternative products, nutrition, genetics and epizootic enteropathy were treated. Food Safety. The new tendencies in the commercialization of the rabbit meat were presented, showing a vision of how the rabbit meat must be commercialized to maintain its actual quota of market. How must be implanted a system of critic points in a rabbit farm and the bio-security measures required were others of the subjects treated, being exposed the next obligations that the sector will have to fulfil in this matter in the future. Animal Welfare. A revision of the last research works done in the field of the rabbit welfare was made. The base of the conference was the draft of recommendations that is struggling at the present time in the EU. European Food Safety Agency, a consultative organ of the European Authorities, will be also present in the Congress to present the opinion that they were elaborating on "the impact of the actual housing and breeding systems in the health and welfare of the domestic rabbits". From this session could be concluded that seems to be required more research in this area to know the ideal conditions of welfare for this specie in commercial farms. Epizootic Enteropathy. This session facilitated to rabbit sector the results of the research trials carried out by different research teams during last the four years. During the sessions on Animal Production, Alternative Products, Nutrition or Genetics, the most distinguished researchers of Spain and Portugal presented the results of their last works.

Animal Production

THE NEED TO HAVE MARKET STUDIES ON THE PRODUCTION AND CONSUMPTION OF RABBIT AND TO IMPROVE THE "E.N.C." OF THE "MAP" WITH INTERNATIONAL COLLABORATION.

CAMPS I RABADÀ J. jaumecamps.vet@terra.es

The rabbit segment, as animal production and meat consumption, should be divided in four groups. The producers (rabbitries), the feed industries, the processors (slaugthering plants), and all distribution till last consumers. Plus others in complementary functions. All the groups doesn't have identical purpose. But all they have economic and commercial objectives. As the same the medium to big enterprises does, they need a "Market Survey" carried yearly, to

better know the rabbit market situation. evolution, and trends. Only with all the data, as it is doing in the economic-commercial companies, it's possible to arise the objective of improvement. The Spanish Ministery is making great economic effort, to prepare their "National Rabbit Enquiries". However, the data means small positive info for the segment. In the last survey began some improvements (ENC 04), but is convenient to ameliorate it. First the system to recall the data, and, second, and mainly, to complete the directory of the individuals. All the info in ENC, needs to be complemented by a survey on distribution and last consumers habits, as # four group. There are a lot of professionals, and groups, who obtain complet info about productions, or consumer habits, in Italy, Spain, France an Portugal, in order of their volume of production. All data differ, country by country, and are impossible to compare it. In this paper I propose an international agreement, using similar metodology. Allways whith the Ministeries, Interprofessionals, and Rabbit Associations, collaboration. It's the better form to help each group, country, and the rabbit culture. Improvement that will bring economic and social benefits to all.

Animal Welfare

EFFECT OF THE STOCK DENSITY ON THE INDIVIDUAL GROWTH OF RABBITS DURING THE FATTENING PERIOD. BAENA, P.L.*, TORRES, C.†, GARCÍA, M.L.*, MUELAS, R.*, ANIORTE, V.*, ARGENTE, M.J.* *Div Producción Animal. Univ. Miguel Hernández de Elche. Orihuela. †Dpt. de Ciencia Animal. Univ. Politécnica de Valencia. mariluz.garcia@umh.es

A total of 745 rabbits were housed in identical cages by stocking density of 36,36; 42,42; 48, 48 and 54,54 kg/m². Individual weights and daily gain were recorded weekly between 28 and 63 days of age. The experience took place in spring, summer and winter, and the animals came from different parity orders. The individual weight and the daily gain showed significant differences between animals kept in lower stoking densities than rabbits reared in higher densities. The individual weight at 63 days were 1663 g. and 1648 g. for rabbits kept in 48,48 and 54,54 kg/m² respectively, and 1731 g. and 1702 g. for rabbits reared in 36,36 and 42,42 kg/m2, respectively. And concerning to daily gain in the fattening period, the results were 33,2 and 32,8 g/day and 35,2 and 34,3 g/day, respectively.

ENVIRONMENTAL ENRICHMENT FOR REPRODUCTIVE DOES HOUSED IN INDIVIDUAL CAGES.* MARÍA G.A.*, SALDUENDO D.*, LÓPEZ M.*, BUIL T.*, ALIERTA S.† *Dpt. de Producción Animal y Ciencia de los Alimentos. Fac. de Veterinaria. †SAEA. Univ. de Zaragoza.levrino@unizar.es

The aim of this study is to investigate the behaviour and the utilization of the cage by adult does kept in cage provided with different elements of enrichment of the environment.

Eight adult does housed in a $50 \times 90 \times 41$ cm cage were studied. The materials used for the enrichment were wood (one cube, one sphere and one stick), straw and one tube of PVC. Five treatments were defined: cube, straw, sphere, stick and tube. At the beginning of the experiment the does were observed with out any enrichment material as a control group. Each treatment was video recorded for 48 hours using the instantaneous sampling method, with observations of 1 minute every 5 minutes. In each observation the spatial orientation of the rabbit was registered (diagonal, longitudinal or transversal), the space use according with coordinates and the main behaviour performed by the doe at this time. The behavioural repertoire used was the described by Kraft (1979). The treatments significantly affect the frequencies of the behaviours observed (χ^2 2575 P<0.0001). The interaction of the rabbits with the enrichment elements vary significantly between treatments (P < 0.001). The best enrichment element was the stick with 5.43% of the observations interacting with the element. The object of least interest was the sphere (0.62%). The second most interesting element for the doe was straw (4.21%). The treatments cube and tube show a medium level of interest (2.83% and 2.94%, respectively). In general, the proposed enrichment elements enlarge the spectrum of behaviours of the does, with the only exception of the sphere. The best elements were the stick and the straw. The treatments also significantly affect the frequencies of the spatial orientation of the rabbits and the use of the spaces according with cage coordinates (χ^2 750 P < 0.0001 and χ^2 5075 P < 0.0001, respectively). From the five enrichment elements tested we can recommend straw and the wood stick as the best ones. Nevertheless, the cube and the tube also perform well and could be used as enrichment material.

STUDY OF THE BEHAVIOUR OF GIANT SPAIN MALES HOUSED IN CAGES ENRICHED WITH EMPTY CANS. CARRILHO M.C.*, GRACIA A.B.†,

LÓPEZ M.* Dpt. de Producción Animal y Ciencia de los Alimentos. *Unid. de Producción Animal. †Unid. de Nutrición y Alimentación Animal. Fac. de Vet.Zaragoza. marina@unizar.es

Twenty Gigante de España adult males, kept temporarily at sexual rest, were divided in two goups and kept individually in convencional cages in two laterally oposed rows in a rabbit farm. 10 empty cans of soft drinks were distributed, during two weeks, to ten males located in intercalated position with those which were not supplied with the can (control group). The cans were distributed at 9:00 am and colected at 7:00 pm every day, and a discontinuous recording of the behaviour of both groups (with can and control) was carried out during 4 hours in the day (9:00-10:00 am, 12:00-01:00 pm, 3:00-4:00 pm and 6:00-7:00 pm) (480 observations/animal recorded). The frequency of the behaviours eating and moving the slat did not differ between groups and, logically, the rabbits which had the can made available to them were the only ones which could interact with this object. Also, were the rabbits which had the can which, curiously, showed a higher resting frequency (73% vs. 66.1%. P<0.001) and lower frequency in each one of the other activities: self-grooming (12.3 vs. 14.7%, P<0.05), carrying out movements (3.4 vs. 5.6%, P<0.05), exploratory behaviour (2.2 vs. 4.0%, P < 0.05), drinking (1.5 vs. 3.1, P < 0.05), gnawing and polishing (0.3 vs. 3.2%, P < 0.05). These differences between groups were significant in the overall and also in each one of the four control hours. The rabbits which had a can used it more frequently during the first control hour (novelty effect) (more than 40% of the cases) and the individual variability in the use of the object was very pronounced. Respect to the hourly distribution of the behaviours, it seems that the rabbits have a tendency to selfgrooming, eating and drinking more frequently in the two hours in the afternoon, although the drinking activity was similar during the four hours in the control group. The resting frequency was also similar in the first and in the two last hours evaluated, while from 12:00 to 01:00 pm a proportionally higher amount of animals of both groups (27.9%) rested more and, in the contrary, during this hour, the frequency of the movements as well as that of the remaining behaviours was very low. The exploratory activity and that of gnawing/polishing was very

high during the first hour and also in the last one, especially in the control group.

Alternative Products

EFFICIENCY OF TOYOCERIN® IN GROWING RABBITS. ESTEVE - GARCIA E.*, RAEL O.*, JIMÉNEZ G.†*Inst. de Recerca i Tecnologia Agroalimentaries †ASAHI VET, S.A. gjimenez.asahi@infonegocio.com

A series of fattening assays were conducted to study the efficacy of Toyocerin fattening rabbits. Rabbits were randomly allocated one of four experimental diets: 1) a basal diet (T-1, negative control); 2) basal + 200 mg Toyocerin 109/kg of feed (T-2); 3) basal + 500 mg Toyocerin 109/kg of feed (T-3); and 4) basal + 1000 mg Toyocerin 109/kg of feed (T-4). Five consecutive fattening assays were conducted. Toyocerin significantly improved weight gain and feed efficiency of fattening rabbits in a dose response manner. Results suggest a positive effect of Toyocerin on weight gain and feed conversion.

Nutrition

EFFECT OF FEEDING MANAGEMENT AND GENETIC TYPE ON THE PERFORMANCE OF REPRODUCTIVE RABBIT DOES. PINHEIRO V.*, MOURÃO J.L., CARVALHO C. *Dpt. de Zootecnia, UTAD, Vila Real. vpinheir@utad.pt

In a work accomplished in an industrial farm was intended to study the effects of feed management during rearing and gestation periods and genetic type on productive performances of primiparous does. The three feed managements used differ in the fibre content of feeds and in the amount distributed (ad libitum or restricted). The does were of two genetic types, one with maternal aptitude (reproduction, nursing) (type M) and the other meat aptitude (type C). The feed management did not influence either the evolution of the does live weight or their productive performances. Only the mean daily feed intake in the rearing period was lower in the feed restricted animals. At the beginning of the trial, the meat type does have a superior live weight that stayed until the parturition. The feed intake didn't differ between the two types of animals. The does of the

maternal type had a smaller number of death pups (about 1/3), heavier pups at weaning (12.5%) and highest mean live weight gain of pups in the second nursing period (18% superior). The pup's mortality between the birth and the second artificial insemination of the does was 4 times higher (3% vs. 12.5%) in the meat type animals. The fertility was 88% in the animals of type M and 67% in the animals of type C, although these values didn't differ significantly.

EFFECT OF THE ADDITION OF PROPYLENGLYCOL IN THE DIET ON THE PERFORMANCE OF REPRODUCTIVE RABBIT DOES. NICODEMUS N., GÓMEZ CONDE M.S., CHAMORRO S., RODRÍGUEZ GRANADOS J.D., GARCÍA J., DE BLAS, J.C. Dpt. de Producción Animal, ETSI Agrónomos, Univ. Politécnica de Madrid. nuria.nicodemus@upm.es

The aim of this work was to study the partial substitution of starch in a commercial control diet (diet C: 19% starch/DM) by a mixture of fibre and fat (diet G) or by a 2,5% of propylene glycol (diet P), in order to reduce the starch levels until 10,6 or 16,3% starch/DM, respectively. Two of the treatments (C and G) were supplied throughout the reproductive cycle. In the third (G+P), the rabbit does were only fed diet P from 21 days of lactation to the next parturition. For the rest of the cycle they were fed diet G. Milk production and productivity was determined during four successive parturitions with natural mating and by using 72 New Zealand × Californian rabbit does that was assigned at random to the three treatments (24 per treatment). The rabbit does were presented to the male four days after parturition and litters were weaned at 25 days of age. The mortality was reduced from 17,4 to 0% (P = 0.05) and the parturition-effective mating interval by 4,3 days for the rabbits of treatment G+P with respect to those fed only with the lower starch content diet (G). These doe rabbits also tended to have higher fertility that those fed treatment G (88,2 vs. 81,3%; P=0.08), but it was similar to that obtained with treatment C (88,8%). Mortality at birth of young rabbits tended to be lower (by 2,52%; P=0,09) in the animals supplied with propylene glycol (G+P), with respect to the control diet (C). The feed intake of the diet with the lower starch content (G) by the young rabbits from 21 days to weaning was 41% lower, with respect to the other two treatments. However, as the milk intake during lactation was 11,5% higher, the average daily gain in the whole lactation was not affected by treatments (22 g, on average). Feed conversion ratio was better in the animals feed diet C with respect to G (2,65 vs. 2,87 g/g; P=0.05), and no significant differences were found with respect to those treated with propylene glycol (2,65 vs. 2,79; P=0,19). Feed intake during lactation, milk production of rabbit does and, as a consequence, litter weight at weaning, increased linearly (PL<0,001) up to the third parturition. After that, these parameters decreased (quadratic effect; PO<0,001). The number of young rabbits born alive and weaned at 25 days increased linearly (PL=0,001) and quadratically (PQ=0,02 and PQ<0,001, respectively) with parity order. Fertility also varied linearly (PL= 0,01) and quadratically (PQ=0,006) with parity order. It was minimum in primiparous rabbit does (74,4%), increased after the second parturition (90,2%), and decreased again after the third (81,9%).

EFFECT OF DIETARY FAT SOURCE AND OXIDATION LEVEL ON THE DIET DIGESTIBILITY IN GROWING RABBITS. CASADO C., BIGLIA S., MOYA V.J., CERVERA C. Dpt. de Ciencia Animal. Univ. Politécnica de Valencia. 46071 Valencia. cricayus@doctor.upv.es

The effect of addition of sunflower or linseed oil respect to animal fat and level of oxidazed sunflower oil on the digestibility coefficient of diet was evaluated in a in vivo assay with 50 fattening rabbits. Dry matter, organic matter and crude protein digestibility coefficients were not affected by diet. The digestibility of ether extract of diet was lower for animal fat in relation to vegetal fats (62% and 67.5%, respectively), but no differences were found between the type of poliinsaturated fatty acid (n-3 or n-6) used. The oxidation level of sunflower oil decreased the digestibility of crude energy (56.7% with oxidated oils versus 60.7% with natural oil). NIR spectroscopy of rabbit faeces could be usefull

to discriminate animals feed with animal fat diet or vegetal diets.

NITROGENEOUS VALUE OF SOYA PRODUCTS AND SUNFLOWER MEALS IN RABBITS. LLORENTE A., GARCÍA A.I., NICODEMUS N., VILLAMIDE M.J., CARABAÑO R. Dpt. Producción Animal, E.T.S.I. Agrónomos, U.P.M. mvillamide@pan.etsia.upm.es

The aim of this work is to determine the true ileal digestibility (TID) of sunflower meals and sovbean products. Therefore, 28 New Zealand White x Californian doe rabbits weighing 4768?421 g each fitted with a glass T-cannula at terminal ileum level were used. Five diets were formulated to contain a maximum level of each feedstuff (35 and 30% of sunflower meals and soybean products, respectively) and a caseinbasal diet for determination of endogenous losses. In the experiment 1, the TID of protein of both sunflower meals (89.3%) was 2.6 and 8.8 points on average higher than the apparent faecal (AFD) and ileal digestibility (AID), respectively. These results could be explained due to higher endogenous losses at ileal level than at faecal level (3.2 vs. 2.5 g CP/d). There were no significant differences among CP digestibility of both meals. In the experiment 2, the AID and TID of CP of soybean meal and fullfat soybean were higher (P=0.0001) than that of soybean hulls (85.3 vs. 23.9%, respectively using AID and 93.0 vs. 46.5%, respectively, using TID). Difference between TID and AID values was higher in soybean hulls than in meal and full-fat soybean (22.6 vs. 8.7 and 6.8, respectively), due to the highest importance of endogenous protein. The relative value, respect to the soybean meal, of full-fat soybean and hulls increased 3 and 22 points, respectively, when the CP AID values were corrected by endogenous losses. The AID and TID of CP of soybean meal were 6 points on average higher than AID and TID of CP values of sunflower meal 38 (P=0.0003 and P=0.0158, respectively for each unit). In conclusion, the use of AFD and AID methods lead to underestimation of the ileal utilization of nitrogen content of the feedstuffs compared with TID method. Moreover, protein digestibility is depending on botanic origin and thermal treatments of seed.

FEED INTAKE OF LACTATING KITS: EFFECT OF THE SEASON AND RELATIONSHIP WITH MILK INTAKE. SOLER M.D.*, BLAS E.†, CERVERA C.†, BIGLIA S.†, CASADO C.†, FERNÁNDEZ CARMONA J.†
*Dpt. de Producción Animal y Ciencia y Tecnología de los Alimentos, Univ. Cardenal Herrera-CEU, Moncada.
†Dpt. de Ciencia Animal, Univ. Politécnica de Valencia, eblas@dca.upv.es

The trial involved 400 litters (208 in spring, 72 in summer and 120 in autumn), equalized to 10 animals from birth to the start at 17-day old. Milk intake was daily recorded from 18-day old until weaning, at 28-day old; litter weight and size, as well as feed intake, were controlled at 17, 21, 25 and 28-day old. Best performance was obtained in spring. Litters were slighter in summer (-7.8) and -6.1% at 17 and 28-day old respectively. P < 0.001), as a consequence of lower milk intake (-8.8 during the controlled period, P < 0.001) whereas feed intake was not affected during this season. Litter growth was also lower in autumn than in spring (-1.5% and -3.6% at 17 and 28-day old respectively, P<0.01 v P<0.001) because of lower milk intake (-3.6% during the controlled period, P < 0.05); additionally, feed intake during three days before weaning was also lower than in spring (-9%, P<0.01). Feed intake was negatively correlated with milk intake, more consistently as near to weaning; correlation with litter weight was positive and also more consistent in more developed animals. Regression on both variables explained 6%, 16% and 36% of variation in feed intake during the different considered phases. Differences in feed intake detected during the earliest phase were consolidated in the following.

EFFECT OF THE LEVEL AND TYPE OF PROTEIN IN DIETS FOR KITS ON THEIR PERFORMANCE AND INTESTINAL HEALTH. CHAMORRO S.*, GÓMEZ CONDE M.S.*, PÉREZ DE ROZAS A.M.†, BADIOLA I.†, CARABAÑO R.*, DE BLAS C.* *Dpt. de Producción Animal. E.T.S.I. Agrónomos. Univ. Politécnica de Madrid. †CreSA (UAB-IRTA). Barcelona. España. susana.chamorro@upm.es

The aim of this work was to study the effect of the reduction of ileal flow of crude protein on the digestion efficiency, growth performances and mortality in early weaned rabbits. To deal with these objectives 4 diets were formulated to meet or exceed essential nutrient requirements for growing rabbits. Two diets were formulated to maintain the source of protein and reducing the level of CP from 18.9% to 16.2% (diet A and B, respectively). Another two diets were designed to maintain the same level of crude protein than the diet B and differing in source of protein by substitution of alfalfa hay for a more digestible protein source (soya concentrate), plus a mixture of fibres sources (sunflower hull, sugar beet and apple pulp), completely (diet D) or partially (diet C). A fattening feeding trial was conduced with 42 animals per diet, that were fed with the experimental diets for two weeks postweaning, thereafter all the animals received a common diet until 56 days of age. Faecal and ileal apparent digestibility were determined from 32 to 35 days of age in 10 and 20 animals per diet, respectively. A mortality trial was carried out in animals receiving antibiotics in drinking water (52 animals per diet) or not (70 per diet). The microbial diversity of intestinal tract (ileum and caecum) was characterized by RFLP in animals receiving (18 per diet) or not (14 per diet) antibiotic supplementation. No effect of the level of protein (A vs. BCD) on the faecal apparent digestibility of dry matter and gross energy was detected. However a reduction on the level of protein was related to an increase of faecal apparent digestibility of crude protein from 81.3% to 83.5% (P=0.025). The variation of the source of protein did not affect the faecal apparent digestibility of dry matter (72.2%), gross energy (72.7%), protein (83.5%). In the ileum, no effect of the source neither of the level of protein was detected on the ileal apparent digestibility of dry matter (47.3%) and protein (61.5%). A reduction of the level of protein from 18.9% to 16.2% decreased by 20% the ileal protein flow (P=0.002). However no reduction of the ileal protein flow was obtained by changing the source of protein. During the period that the animals were fed the experimental diets, from 25 to 39 days, the high protein diet showed a greater feed efficiency than lower protein diets (0.648 vs. 0.617, P=0.001). In the global fattening period (from 25 to 56 days) no effect of the source neither of the level of protein was detected on growth performance. The mortality was reduced in parallel way to the ileal protein flow both in animals suplemented (1.3% vs. 7.7%, P=0.017) or not (21.8% vs. 32.8% P=0.068). These effects seem to be related with variations in the presence of some proteolitic bacterias at the ileum that showed changes with the diet. The detection frequency of Clostridium perfringens in the ileum increased (P=0.005) with the dietary protein level in not supplemented animals, but no significant effect was observed in treated animals. In conclusion, these results suggest that it's possible to improve de intestinal health by decreasing the level of crude protein from 18.9% to 16.2% in starter diets without affecting the growth performance in the global fattening period, whenever a correct supply of limiting aminoacids is maintained.

Genetics

STUDY OF THE FACTORS AFFECTING THE LONGEVITY OF A RABBIT POPULATION. SÁNCHEZ J.P., PEIRÓ R., TORRES C., BASELGA M. Dpt. de Ciencia Animal, Univ. Politécnica de Valencia. mbaselga@dca.upv.es

A study of the factors affecting the longevity of rabbit does for meat production was carried out. The population was animals belonging to the first thirteen generations from a selection nucleus. The statistical methodology used was the survival analysis. The median survival time was 392 days. The estimated heritability was 0.08. With regard to the non-genetic factors, it was estimated that by increasing the number of cycle in which the doe lives the risk to be culled is reduced; does in physiological state pregnant and lactating had the lowest risk to be culled, followed by lactating, pregnant and finally empty does; a general pattern was that animals with higher litter size had a lower risk, however this effect depended on the level of the physiological state.

EFFECT OF GROWTH RATE SELECTION ON THE CHARACTERISTICS OF THE RABBIT'S CARCASS AND MEAT. PASCUAL M., PERIS I., VIDAL-JORDAN M., PLA M. Dpt. de Ciencia Animal. Univ. Politécnica de Valencia. ampasam@dca.upv.es

Effect of selection for growth rate on carcass composition has been evaluated in 80 animals from two groups: a group selected for growth rate for 23 generations and a control group formed with animals from the 7th generation of selection. Animals were slaughtered at 2000g of liveweight. Selection did not affected dressing out percentage. Nevertheless, percentage of liver (9,0 vs. 8,1%) and kidneys (1,4 vs. 1,3%) were higher. Selected animals showed and higher percentage of forelegs (17,8 vs. 17,1%) and lower percentage of hind part (37,3 vs. 38,5%), and meat to bone ratio in the hind leg had been decreased (4,1 vs. 4,5). Percentage of fat in the carcass seemed to be higher in the selected group (2,1 vs. 1,9%).

EFFECT OF SELECTION FOR LITTER SIZE AND LONGEVITY ON THE PERFORMANCE OF PRIMIPAROUS RABBIT DOES. FIRST RESULTS. THEILGAARD P., AÑO V., SANCHEZ J.P., BASELGA M., PASCUAL J.J. Dpt. de Ciencia Animal. Univ. Politécnica de Valencia. jupascu@dca.upv.es

The evolution of the corporal condition of a total of 123 rabbit does selected by longevity (n=57; line B) or prolificacy (n=66; line V) criteria were compared during their first reproductive cycle. following their live weight and perirenal fat thickness by ultrasounds. Does of line B always showed a greater live weight throughout this experiment, being the differences emphasised at 10 d of lactation (+226 g; P<0.05). Perirenal fat thickness was not affected by type of line, but does of line B showed an increase of their perirenal fat thickness between the days 10 and 25 of lactation (+0.46 mm), while does of line V showed a decrease (-0.19 mm: P<0.10) during this same period. The number of pups born alive during first lactation was similar for lines B and V (8.93 and 8.98, respectively). The corporal condition at mating, parturition and 10 d of lactation was not related with the litter size, but there is a clear reduction of the perirenal fat thickness of does at 25 d of lactation when press of lactation (litter size) increased. The present work only show preliminary results which must be confirmed in the future, but seem to be differences in the live weight and corporal condition of reproductive does in function of the selection criteria (longevity or prolificacy), which could be related to the potential reproductive life of the animals.