# HEALTH STATUS OF DOMESTIC RABBITS IN THE IBERIAN PENINSULA. INFLUENCE OF THEIR ORIGIN

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## ABSTRACT

A retrospective study was carried out on the health status of does on 115 intensive production rabbitries in the Iberian peninsula, to evaluate the effect of the "animal origin" variable used on these farms, on the percentage of females affected by coryza, mastitis and sore hocks. 277 samplings were carried out on a total of 13,941 suckling females, with a mean size of 50.3 does examined per sampling, during 3 years (January 2001-February 2004). On all the farms the same origin was used for the does as for the bucks (or semen), which belonged to one of the following five groups: S, O, M, I and U. The effect of other variables (whether all the does were given injectable antibiotics on the occasion of parturition or the use of antiseptic aerosols on the hocks, and of footrests) on the prevalence of the previously mentioned diseases was also evaluated by ANOVA. In the case of coryza the influence of the origin of the animal is evident. Rabbitries with the "S" origin had 49.31 percent affected does in comparison with 27.75 % on the following group of rabbitries ("O" origin). In the case of mastitis, farms where antibiotics had been used were eliminated, so that 177 samplings were analysed. In this case, origin of the animals was a risk factor in mastitis. For sore hocks, rabbitries using footrests were not included, so 153 samplings in which 7,699 examined does did not have footrests were analysed; in this case the prevalence of sore hocks was significantly higher in groups "S" (15.26 % affected does) and "U" (10.73 %), the percentage for both being above the overall mean of 9.19 %. An evaluation of the possible causes of differences between origins would be useful in future studies.

**Key words:** rabbit, pathology, animal origin.

## INTRODUCTION

Coryza/snuffles in does, clinical mastitis and sore hocks are notable diseases on intensive production rabbitries in the Iberian peninsula. Prevalence was 22.1 %, 4.5 % and 10.4 %, respectively, in 8,209 suckling does examined on 110 rabbitries during 2002 (ROSELL, 2003). In the course of 2002 the monthly mortality rate for does was 4 % and culling 4.1 %, in a group of 64 rabbitries with a mean size of 623 does per rabbitry (COGAL, 2003). In another group of 87 rabbitries with a mean of 826 breeding does per

farm, using insemination on 65 % of them, and with an overall result of 81.1 % gestations on palpation and 74.3 % parturitions over mount or insemination, the monthly figures were 3.3 % losses, plus 5.6 % cullings (ROSELL and PÉREZ, 2003).

As for the number of culled does (or voluntary eliminations), diseases of the respiratory system accounted for 30.5 % of all losses during the year on rabbitries where these disorders were predominant, whereas mastitis accounted for an annual percentage of 30 % and sore hocks 12 %, on farms affected by staphylococcal infection (ROSELL, *opus cit*). In the case of dead females, during 2001-2003 necropsies in rabbitries were carried out on 293 examined does; pneumonia, hemorrhagic septicaemia, metritis or acute mastitis were the apparent cause of disease, death or both in 40 % (unpublished).

From the epidemiological perspective, different predisposing risk factors of disease such as sex, age, parity, or week of lactation, and some enabling risk factors, such as year, season, and type of rabbitry, have already been studied in relation to coryza/snuffles, mastitis and sore hocks. The effect of the line as a disease determinant has been demonstrated by BASELGA *et al* (1988) in respiratory diseases, and by COUDERT and BRUN (1989) in other diseases.

This study aimed to evaluate the influence of the animal from the technical perspective, that is, whether differences between lines and the origin of the animal exist as a predisposing risk factor of disease. This question is often discussed in the commercial sphere; however, a detailed epidemiological analysis is required to verify its importance. It was not possible to distinguish between the effect of the line (belonging to a breeder) and the effect of the farm which produced the commercial bucks and does (one breeder may have several multipliers). Therefore we studied a synthetic factor which combined the line and the farm; we called it “origin”.

## MATERIAL AND METHODS

This study is based on the analysis of information recorded by a veterinary practitioner on 277 visits to 115 rabbitries in Spain and Portugal, between January 2001 and February 2004. The population was 95,648 females with a mean size of 831 does in production per rabbitry. These rabbitries provided unequivocal information on different independent variables: Animals: line of the does and bucks or of the semen. After 3 years an evaluation was carried out on animals of 5 origins called S, O, M, I and U in this study. Other factors were taken into consideration: date, whether footrests were used in the female cages or not, injectable antibiotics given on occasion of parturition and antiseptic aerosols used on the hocks (“paint”: yes or no). In the latter two cases, the handler was asked, and during examination the does’ hocks were checked for remains of colouring. Almost 200 rabbitries were visited during the 3 years, but only 115 rabbitries where both sexes were of the same origin were included in the study. Each origin included the same breeder (or trade mark of a *hybrid* line), but *y unknown* different multipliers of the *x recorded* line.

With regard the dependent variables, the presence or absence of clinical signs or lesions related to coryza/snuffles, "clinical" mastitis and sore hocks (sin. pododermatitis) was evaluated always by the same rabbit practitioner. For each disease, the clinical examination was coded by a discrete binary variable. A total of 13,941 suckling females were examined over the 3 years on the rabbitries, with a mean of 50.3 does per examination. The method used was described in a recent study by ROSELL (2003). Factors influencing prevalence were determined by carrying out ANOVAS on each disease (% snuffles, % mastitis and % sore hocks), taking their prevalence as a dependent variable.

## RESULTS AND DISCUSSION

The overall results of 13,941 observations obtained from 277 samplings on 115 rabbitries during the 3 years (January 2001- February 2004), are shown in Table 1.

**Table 1. Basic statistics for the prevalence of different diseases.**

| Disease | Examinations | % Mean ± S.E. | Range | Std Dev |
|---|---|---|---|---|
| Snuffles/coryza | 277 | 19.41 ± 1.03 | 0-81.67 | 17.15 |
| Mastitis | 277 | 3.71 ± 0.26 | 0-21.11 | 4.31 |
| Sore hocks | 277 | 9.19 ± 0.47 | 0-40.00 | 7.93 |

Prevalence reported was similar to that observed prior to 2001. The percentage of does with coryza decreased from 40 % (in the 80's) to 30 % (in the 90's) to 20 % at present, according to observations made over the last 21 years (1983-2003) on 1,000 rabbitries in the Peninsula and the examination of 150,638 suckling does. The prevalence of "clinical" mastitis is low but constant (4-5 %), and sore hocks is a relevant disease of moderate-high prevalence: 9-10 %.

The effect of season and origin on the prevalence of coryza/snuffles was evaluated by ANOVA on 277 samplings carried out on 115 rabbitries and the examination of 13,941 lactating does. The results are shown in Table 2.

**Table 2. ANOVA of the percentage of snuffles/coryza.**

| Source of variation | DF | Mean square | F value | Pr > F |
|---|---|---|---|---|
| Season | 3 | 1294.23 | 10.12 | <.0001 |
| Origin | 4 | 9794.74 | 76.60 | <.0001 |
| Residue | 269 | 127.87 | | |
| Model | 7 | 6685.08 | 52.28 | <.0001 |

This analysis shows that the effect of origin of the animal on the prevalence of coryza is clearly significant; highest prevalence was observed in origin S, as seen in the last table in this paper (Table 5). As well as origin, the influence of the season is also important:

prevalence is higher in summer (in July, August and September in Europe), as demonstrated in previous more detailed studies (BADIOLA *et al,* 2000).

**Table 3. ANOVA of the percentage of mastitis.**

| Source of variation | DF | Mean square | F value | Pr>F |
|---|---|---|---|---|
| Antibiotics | 1 | 289.04 | 16.58 | <.0001 |
| Origin | 4 | 15.98 | 1.08 | 0.45 |
| Error | 271 | 17.43 | | |
| Model | 5 | 83.33 | 4.78 | 0.0003 |

The origin of the does not influence the percentage of suckling females with mastitis, but it does affect the use of antibiotics on the occasion of parturition. Surprisingly there are more cases on rabbitries where the does have been treated with an antibiotic. Why? Antibiotics are used as a metaphylactic measure recommended on rabbitries with high prevalence of mastitis; as well as being a hygiene measures, obviously. These effects were therefore analysed separately. In 177/277 samplings no antibiotic was used (63.9 %) and the influence of the origin was evaluated. In this case, it was a risk factor. Rabbitries with animals (females and males of the same origin, as indicated in Material and Methods) belonging to origins S and M showed higher prevalence of clinical mastitis than the others (I, O and U). The results of the ANOVA for "sore hocks" appear in Table 4.

**Table 4. ANOVA of the percentage of sore hocks.**

| Source of variation | DF | Mean square | F value | Pr > F |
|---|---|---|---|---|
| Paint | 1 | 47.2 | 0.83 | 0.361 |
| Footrest | 1 | 599.12 | 16.96 | 0.001 |
| Origin | 4 | 243.53 | 1.08 | 0.006 |
| Error | 270 | 57.09 | | |
| Model | 6 | 384.41 | 6.73 | <0.0001 |

The "paint" effect is not significant, but the "footrest" effect is, and so is "origin". Another analysis was therefore carried out on 153/277 samplings of does that did not have footrests (55.2 %). When footrests are not used, significant differences are observed between the origins in the overall analysis (Table 5).

Finally, Table 5 is a comparison of the mean figures for the influence of origin amongst the 5 categories (S, O, M, I and U) and for the three studied diseases.

The prevalence of coryza/snuffles on rabbitries with does and bucks (or semen) from origin S is 49.31 %, which is much higher than the other lines. This could be related to the "origin" risk factor. The effect of mastitis on rabbitries where the does are not treated with antibiotics on the occasion of parturition is related to the "origin" risk factor. There are also greater differences in the case of sore hocks on rabbitries where footrests are

not used; origin S is the most affected (P= 15.26 %), but "U" with a prevalence of 10.73 %, is also above the mean (9.19 %, Table 1).

**Table 5. Influence of animal origin on the Prevalence of diseases.**

| Origin | P Snuffles/coryza n= 277 (13,941 does) | P Mastitis n= 177 (8,903 does) | P Sore hocks n= 153 (7,696 does) |
|---|---|---|---|
| S | 49.31[a] | 4.83[a] | 15.26[a] |
| O | 27.75[b] | 4.27[a] | 9.05[b] |
| M | 19.03[b] | 4.37[a] | 8.59[b] |
| I | 15.29[b] | 2.05[b] | 8.31[b] |
| U | 12.15[b] | 2.60[b] | 10.73[ab] |

Where P is Prevalence (%) and n= number of examinations. a,b values with a different superscript letter in the same column were significantly different. P< 0.05

An analysis of other variables that could perhaps explain why some origins of rabbits are more predisposed to certain diseases would be of interest in future studies; for instance, including the health status of females of the *x* line/s (breeder/s), from the known *y* multiplier/s, on the same commercial rabbitry.

## CONCLUSION

The analysis shows the significant effect of the "origin" variable on the prevalence of coryza/snuffles. It also has a significant effect on mastitis and, in particular, sore hocks, after disregarding factors that could cause confusion such as the use of footrests or antibiotics on the occasions of parturition. The results obtained may be used as a basis for improving health control programmes. It would also be of interest to discover the cause of differences between origins.

## REFERENCES

BADIOLA SÁIZ J.I., ROSELL J.M., DE LA FUENTE L.F., CUERVO L. 2000. (Aparato respiratorio). **Chapter XVII, pp 265-300,** in: (*Enfermedades del conejo).* **Vol II.** ROSELL, J.M. (ed.). Mundi-Prensa Libros, Madrid, Spain.

BASELGA M., DELTORO J., CAMACHO J., BLASCO A. 1988. Genetic analysis of lung injury of four strains of meat rabbit. *Proceedings of the fourth World Rabbit Congress*, **2:** 120-128. Budapest, Hungary.

COUDERT P., BRUN J.M. 1989. Productivité et morbidité des lapines reproductrices: etude comparative de quatre genotypes. *Génét. Sél. Evol.* **21:** 49-65.

COGAL 2002. Resultados de Gestión 2002. *Boletín de Cunicultura* **130.**

ROSELL J.M. 2003. Health status of commercial rabbitries in the Iberian peninsula. A practitioner's study. *World Rabbit Science* **11:** 157-169. *Also available at*:

http://www.nanta.es/esp/area_tecnica/documentos/health.pdf. *Accessed 06 May 2004.*

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