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TRADITIONAL MANAGEMENT OF THE RUSTIC RABBIT IN MOUNTAIN AREAS: THE CASE OF THE GISTAIN VALLEY OF THE CENTRAL PYRENEES OF HUESCA

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ABSTRACT

This study describes the *modus operandi* of rabbit production in a Pyrenean village in the maximum possible detail. The facilities are mostly homemade and although they are deficient in terms of comfort parameters established for industrially raised animals, they are well adapted to the type of feed administered: dry branches of *Fraxinus excelsior*, ‘revolé’ and meadow’s plants. The average number of reproducing does per exploitation unit is 3.67 ± 1.58 ; the births interval in days is 63.66 ± 15.34 , which translates into 6.08 ± 1.46 births per doe rabbit a year. Lactation lasts 47.15 ± 15.23 days. The average proliferation is 8.70 ± 1.89 , and the number of animals weaned per birth is 7.80 ± 2.37 . These resources could increase the familiar incomes by sales of rabbits of quality.

INTRODUCTION

The production, raising and consumption of the rustic rabbit in rural areas contributes to the diversification of the diet and to the income of the exploitation. In mountain areas, self-sufficiency and a subsistence economy have perhaps been more accentuated than in lowland areas. Thus, in these areas, proper care and efficient planning in the use of available resources directly influence the quality of life enjoyed by the inhabitants.

In rural mountain areas, intensified rabbit exploitations are unknown and the means for producing economically viable quantities do not exist. Rural breeds (most of which are unclassified and untypified) are raised in homemade structures, following extensive production methods and feeding the animals on traditional resources available in the area (Lukefahr & Cheeke, 1991).

At present, the serving of homegrown rural rabbit dishes in restaurants and households of mountain villages provides an ideal opportunity for the conservation of the genetic resources of rural Pyrenean breeds, and of the natural resources in the form of ash and meadows, etc.,

thus contributing to the maintenance of rural populations in their place of origin (De Rochambeau & Vrillon, 1980; European Commission DG IV, 1997).

Thus it seems logical to begin by studying the type of rabbit exploitation practiced in mountain areas, and so the main objective of this study consists in providing a comprehensive view of the rabbit production system in a mountain area which is home to a differentiated species which we will call rustic. We will also look at traditional eating habits and, above all, at the limitless desire to make the quality of these products known and to highlight the proper care employed in their elaboration.

MATERIALS AND METHODS

The study area is in the Gistain Valley, more specifically the village of San Juan de Plan (0° 20' 54'' 2 E, 42° 35' 20'' N, 1.150 m a.s.l.) in the Central Pyrenees, within the Province of Huesca (Spain).

The village was visited and those responsible for each exploitation were interviewed and questionnaires were completed to provide information for the following: (a) an analysis and description of the exploitations, (b) a follow-up of reproductive does in each exploitation, (c) a study of the process of production and of the feed given to the animals (see Appendix for variables analyzed). Qualitative variables were punctuated by two independent valuers during different visits. The botanic classification was made following Flora Iberica (Castroviejo *et al.*, 1986; 1990) and Flora Europea (Tutin *et al.*, 1964-1980).

RESULTS AND DISCUSSION

We found that there were as many exploitations as houses inhabited, which gave us a global total of 35 rabbit exploitations. All these were visited but only nine (25.71%), selected at random, were formally subjected to the questionnaire.

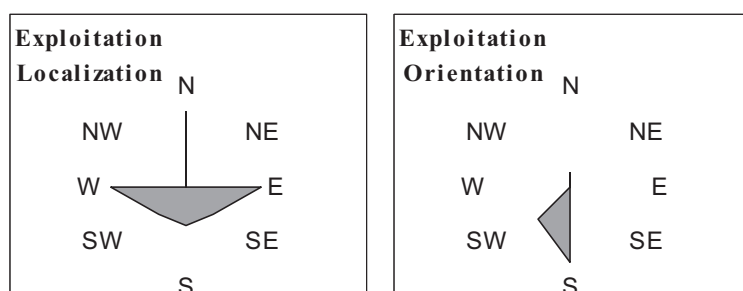


Fig. 1: Exploitation localization and orientation of the rural study.

Considering the village surface divided in four geographic quarters according to orientation, we can see that the main group of questioned farmers have their exploitations in South exposition (SW- S-SE) (88 %) and the cages inside every farm are oriented at SW-S (100 %). By this way, the illumination and temperatures are favorable in these mountain conditions.

All exploitations have reproductive does of the rustic breed, while only 33% have commercial breeds C x NZ, and 55% also work with other breeds. The majority of exploitations (77%) dedicate production to home consumption, while the remaining 23% sell their rabbits to restaurants and hostels either within the village or outside it.

The number of reproductive does per exploitation is 3.67 ± 1.58 , and the total number of animals is 31.33 ± 12.70 . As might be expected, these variables reveal differences between exploitations which sell rabbits and those which do not (6 ± 0 vs. 3 ± 1 , for the number of reproductive does; and 49 ± 6 vs. 26 ± 9 for the total number of animals).

The infrastructures and facilities available for production are almost entirely homemade. Most of the hutches for reproductive animals are made of wooden planks and chicken wire. Old troughs are used for feeding. Only in very few cases have brick and mortar structures with metal gates been built, and only those exploitations, which sell rabbits, actually keep them in commercial hutches with standardized feeding and drinking troughs.

Table 1: Classification of infrastructure characteristics (3 = good; 2 = acceptable; 1 = bad).

Variable	Mean \pm SD
Draught	2 ± 1
Illumination	2 ± 1
Humidity	1 ± 1
Temperature	1 ± 1
Soil	1 ± 1
Feeding and drinking trough	1 ± 1
Health	1 ± 1

As can be appreciated from table 1, the general exploitation conditions are somewhat deficient and in keeping with extensive, cottage industry systems. Once again, the

exploitations which commercialize their produce show differences which are favorable with regard to the state of feeding and drinking troughs (3 ± 1 vs. 1 ± 0 ; good vs. bad) and to the sanitary conditions of the facilities (2 ± 0 vs. 1 ± 0 ; acceptable vs. bad).

Animal feeding is mainly carried out using resources available in the area. The majority of these exploitations provide a diet that is adapted to the seasons. Thus, ash branches (*Fraxinus excelsior*) and 'revoles' (shoots, leaves and seeds which are left over in the meadows after baling and which are collected manually in sacks) make up the greater part of the diet in these areas, where winter lasts for almost half the year. The greatest quantity of herbaceous plants for the feeding of rabbits is collected in the spring (primarily *Achilea millefolium*, *Artemisa vulgaris*, *Lathyrus laevigatus*, *Lathyrus sylvestris*, *Clinopodium vulgare*, *Vicia cracca*, *Vicia sativa*, *Lapsana communis*, *Trifolium montanum*, *Trifolium pratense*, *Potentilla reptans*, *Dactylis glomerata*, *Plantago lanceolata*, *Centaurea nigra*, *Taraxacum officinale*, *Briza media*, *Lotus corniculatus*, *Calistegia sepium*, *Silene inflata*, *Hordeum murinum*, *Medicago lupulina*, *Festuca rubra* and *Leontodon hispidus*), whereas in commercial exploitations, compound animal feeds and barley have largely substituted the 'traditional diet described above (2 ± 0 vs. 1 ± 0 ; traditional diet plus concentrate and barley vs. traditional diet).

Despite the advantages mentioned earlier, the use of commercial hutches nevertheless hampers the consumption of ash branches, other types of tree forage and 'revolé' for a number of reasons: (a) branches are directly given to the animals as they were stored, in bunches (Gómez & Fillat, 1981), and even the bark is consumed, therefore it is obviously impossible to introduce a whole bunch in a commercial hutch; (b) as the floor of the hutch is grooved, a large amount of feed is lost, especially leaves and 'revolé', if it is cut before being introduced into the hutch. On the other hand, in homemade hutches with old troughs which are spacious and do not have a grooved floor, the bunches are administered whole and the 'revolé' is dispersed on the floor and eaten by the animals on demand so that only the thickest shoots remain uneaten after nibbling away the bark. Thus the 'revolé' is fully used and there is virtually no loss of feed (for size and a proportion of bunches see Creus *et al.* (1984). Therefore, it seems more appropriate to adapt extensive facilities to this type of production and feeding, with larger hutches on the ground or homemade constructions which are more appropriate for this type of animal (De Lazzer & Finzi, 1992; Bujarbaruah & Das, 1996).

With regard to the management in rural mountain areas, where traditionally housework and care of the animals which are closer to the household are women's jobs, it is precisely the women (in 55% of cases) and grandmothers (in 33% of cases) who look after the rabbits.

The most relevant characteristics of the production system are described in the following table:

Table 2: most relevant production variables (n = number of observations).

Variable	n	Mean \pm SD
Age of reproductive doe (months)	18	11.94 \pm 6.35
Weight of reproductive doe (kg.)	18	3.35 \pm 0.56
Births interval (days)	6	63.66 \pm 15.34
Duration of presentation to male (hours)	20	30.00 \pm 13.20
Live births	20	8.70 \pm 1.89
Number of animals weaned per batch	20	7.80 \pm 2.37
Death rate from birth to weaning (%)	20	10.35 \pm 20.11
Weight of batch on weaning (kg)	16	7.62 \pm 2.44
Days of lactation	20	47.15 \pm 15.23

These results are somewhat unfavorable when compared to those of intensive production systems within the region (Gil & Velilla, 1998), although these differences can be ignored due to the incomparable nature of both systems, given that we are talking about a cottage industry in rural mountain areas as opposed to industrial farms on the plains. Therefore, with the exception of death rates from birth to weaning in which the results obtained in our study area are more unfavorable (10.35 \pm 20.11 vs. 6.8 \pm 0.0), the production data are similar to those obtained with indigenous animals in other cold areas (Guozhong *et al.*, 1996), and identical to the production data obtained in extensive raising systems (Méndez *et al.*, 1986). Finally, if we compare our results obtained for animals of the rustic breed in the Pyrenees with those obtained for the *Gigante de España* breed (López, 1992) we can verify that the longer interval between births in our case (63.66 vs. 53.19 in days), is the determining factor in the lower number of births per doe per year. However, we obtain a higher prolificity rate (8.70 vs. 8.39) and a greater number of weaned animals per birth (7.80 vs. 5.99), even with a relatively similar death rate from birth to weaning (10.35 \pm 20.11 vs. 26.10 of mean).

CONCLUSIONS

- Despite relatively deficient facilities, good production indices are achieved. It would be interesting to further investigate the type of facility which is most appropriate for this type of extensive exploitation system in mountain areas.
- The feed administered makes use of natural resources which would otherwise not be used and therefore contributes to their conservation. Agro-environmental measures could support these practices economically, for as has been mentioned, the exploitations that produce the

largest number of rabbits are intensifying feeding with the use of other products.

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Appendix

Variables utilized in to the analysis of the exploitations:

- Exploitation Localization and Orientation: N, NE, E, SE, S, SW, W or NW.
- Number of female in production.

- Number of all animals.
- Animal's breeds: yes or not rustic breed, yes or not commercial breed, yes or not other breeds.
- Animal's feed: 1 = traditional diet; 2 = traditional diet plus concentrate and barley; 3 = only concentrate and barley.
- Management (who is responsible of the animals?): 1= only grandmother; 2 = grandmother and wife; 3 = only wife; 4 = only husband; 5 = all the family.
- The facilities: 1 = homemade; 2 = medium; 3 = modern.
- Draught & Illumination & Humidity & Temperature & Soil & Feeding and drinking trough & Health: 0 = very bad; 1 = bad; 2 = acceptable; 3 = good; 4 = very good.