Evolution of the parameters (CP, TDOM) in natural communities in the Sayago Region (NW Spain) of feeding interest of the autochthonous bovine breed "Sayaguesa"

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Evolution of the parameters (CP, TDOM) in natural communities in the Sayago Region (NW Spain) of feeding interest of the autochthonous bovine breed 'Sayaguesa'

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SUMMARY - The greater part of the 'Sayaguesa' bovine breed specimens live within the Sayago Region (Zamora -Spain) and their feeding is based on the use of plant forage from meadows and mowing of the area. The evolution of crude protein (CP) and total digestible organic matter (TDOM) indicate that it is possible to modify the guidelines of usage of these surfaces with the aim of better use of their nutritive potentials.

Key words: Natural resources, threatened species.

RESUME *- "Evolution des paramètres (CP, TDOM) dans des communautés naturelles de la région de Sayago (nord-ouest de l'Espagne) d'intérêt nutritionnel pour la race bovine autochtone 'Sayaguesa'". La plupart du cheptel bovin de la race 'Sayaguesa' se trouvent dans la région de Sayago (Zamora - Espagne) et se nourrient d'une alimentation à base de pâturage et de l'affouragement en vert de la zone. L'évolution des matières azotées totales (CP) et de la matière organique digestible totale (TDOM) est un résultat aguichant qui nous indique sur la possibilité de diversifier les modes d'exploitation de ses superficies pour mieux profiter leurs potentiels nutritifs.*

Mots-clés *: Ressources naturelles, espèces menacées.*

Introduction

The Sayago Region, situated in the north west of the province of Zamora (Spain) is of special interest because of its traditional farming methods (Sánchez, 1991, 1993) which has given rise to diversification and breeding of different animal breeds of which the 'Sayaguesa' bovine breed is outstanding.

Currently the low number of specimens of this breed (Avon, 1990) is listed as a threatened species and its genetic peculiarities (Arranz *et al.*, 1996a,b) make its conservation necessary.

The adequate information on the natural plant communities, which were traditionally used as food, should facilitate the choice of the most adequate guidelines for use (mowing and grazing) depending on the potential and the needs of the livestock.

Material and methods

Locality

This study was carried out in the municipalities of Roelos and Villar del Buey where more than 70% of the livestock live. These areas are situated in the centre of the Salamanca-Zamora granitic plateau, at a height of 750 m.

The soil is considered (Prat and Forteza, 1977) as being shallow, sandy, acidy and poor in nutrients. The climate is a warm Mediterranean type (MAPA, 1987).

The traditional system of feeding animals can be considered as formed by three periods; the first period from November to mid-March when forage (vetch-oats) which was harvested is consumed together with the hay obtained in the mowed "vallicares" complemented with the use of turnip fodder and rye forage. The second period runs from March to July-August when all the existing surfaces are grazed, except for the "vallicares" which are used for hay. The last period from August to November-December is the most difficult one due to the lack of water, the animals have a very dry and poor diet which has to be supplemented with fodder usually brought from outside the area.

Due to the considerations above, sampling on 6 clearly defined areas were carried out to investigate their herbaceous composition. These are:

(i) Communities of *Nardus stricta* (NARD) *Campanulo-Nardion* which represent 3% of the unworked land.

(ii) "Vallicares" *Agrostidetalia,* divided into: fresh (FRESH), damp (DAMP) and mowing (MOW) depending on growing dampness and occupy 22%, 3% and 1.5% respectively of the unworked land.

(iii) *Cynosurion cristati* pastures (PAST) are the less abundant (0.5%) and are usually found close to artificial lakes built as water reserves for the area.

(iv) Annual plant pastures (ANN) *Tuberarion guttatae* make up the unworked land territorial base of the area (70%).

Plant sample taking was carried out in 1996 between 18th April and 19th July. The latter period is usually considered as being the harvest period of these areas. The mowing area was 1 m^2 and was done manually at ground level; four repetitions were carried out in each field group. The statistical analyses were carried out using ANOVA.

Results and discussion

Crude protein (CP%)

The drop in crude protein content (Table 1) as the plant matures is normal for this type of surface (Escudero *et al.*, 1980) but with differences within each one of the herbaceous communities.

The highest values are obtained in the pastures (22.4% to 11.5%) although their reduced extension restricts their overall importance and their exploitation is carried out by gestating females and young animals. The "vallicares" used by mowing have amongst the lowest values, even though they show the least variations with regard to crude protein content which maintain moderate values over a long period (7.8% to 9.9%) and the annual plant communities (10.9% to 6.5%) though with scarce production and very influenced by seasonal rainfall. These figures are lower than those indicated by Luis and Gomez (1992) in the "Salamanca Dehesas".

The fresh "vallicares" (10.8% to 8.8%), the damp "vallicares" (12.7% to 10.6%) and the communities of *N. stricta*. (10.9% to 8.7%) have intermediate values. Their basic difference does not coincide in time in the fall in the nutritive value, the most pronounced fall in protein percentage is earlier in the dry areas and later in the damp ones.

Total digestible organic matter (TDOM kg ha-1)

As a parameter which draws together production and crude protein of forage it can orientate us in the choice of mowing time or at the moment of grazing (Table 2).

The mowing "vallicares" do not show any fall in this parameter during the study period which allows for a late mowing (1,874 kg ha^{-1} TDOM), a similar process happens in the communities of *N. stricta* which allows for a similar use for this type community. The fresh "vallicares" show a maximum at an earlier date

than the previously mentioned and have interesting values with regard to their use through mowing (2,115 - 2,074).

The pastures maintain very interesting values until well into the dry season.

Conclusions

The most rational use of these plant communities should be made with a more efficient use of the communities of *N. stricta* and fresh "vallicares" in the following way:

(i) Early use through grazing on the communities of *N. stricta* and after a repose period of 45 to 60 days (always depending on rainfall), a second grazing until these surfaces are completely grazed.

(ii) With the fresh "vallicares", and given their production, it is necessary not to use them exclusively for grazing but to reserve part of them for an early mowing (beginning to the middle of June).

The annual plant communities should be exclusively used for sheep.

References

Arranz, J.J., Bayón, Y. and San Primitivo, F. (1996a). Comparison of protein markers and microsatellites in differentiation of cattle populations. *Animal Genetics,* 27: 415-419.

Arranz, J.J., Bayón, Y. and San Primitivo, F. (1996b). Genetic variation at five microsatellite loci in four breeds of cattle. *Journal of Agricultural Science,* 127: 533-538.

Avon, L. (1990). Conservation and management of genetic resources of western Europe: Cattle breeds. In *Genetic Conservation of Domestic Livestock*, L. Anderson (ed). CAB International, Wallingford, pp. 8-45.

Escudero, A., Puerto, A., García, B. and García, L. (1980). Producción, composición química y valor nutritivo de comunidades típicas de pastizal salmantino. *Anales de Edafología y Agrobiología*, 39 (1-2): 249-259.

Luis, E. and Gómez, J.M. (1992). La calidad del pasto. In *El libro de las dehesas salmantinas*, Gómez, J.M. (cor). Conserjeria del Medio Ambiente y OT. Valladolid, pp. 537-562.

MAPA (1984). *Mapa de cultivos y aprovechamientos de la provincia de Zamora.* Dirección General de Producción Agraria. Publicaciones del MAPA, Madrid.

Prat, L. and Forteza, J. (1977). Fertilidad de los suelos de cultivo en la Comarca de Sayago. *Anales de Edafología y Agrobiología*, XXXVI, (9-10): 921-941.

Sánchez, L.A. (1991). *Sayago, ganadería y comunalismo agropastoril.* Colección de Etnografía en las Comarcas Zamoranas. Ed. Obra Cultural de Caja España, Zamora.

Sánchez, L.A. (1993). *Las Dehesas de Sayago, explotación, trabajo y estructura social.* Colección de Etnografía en las Comarcas Zamoranas. Ed. Obra Cultural de Caja España, Zamora.

Table 1. Effect of cutting on crude protein (%)

Comm.†	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Cut 6	Cut 7	Cut 8	Cut 9	Cut 10
NARD	11.8 a††	11.1 ab	10.9 b	10.3 b	10.9 ab	8.7 c	8.3 c	8.1 c	7.7 c	5.1 d
PAST	22.4 a	19.5 b	17.4 bc	18.5 c	16.4 d	16.8 cd	15.6 d	14.2 e	11.3 f	11.5 f
ANN	11.3 a	11.9 a	9.8 bc	10.9 ab	9.0 cd	9.9 c	8.3 d	8.3 d	6.5 e	5.3 f
FRESH	15.3 a	13.4 b	10.8 c	8.8 d	8.8 d	8.9 d	8.9 d	8.8 d	8.0 d	5.4 e
DAMP	15.9 a	15.4 a	13.7 b	12.7 b	10.6 c	9.9 d	9.6 cd	10.2 c	8.9 de	7.8 e
MOW				9.9 a	7.8 b	7.9 b	8.0 bc	9.2 ac	9.2 c	7.8 b

†Comm. = Community; NARD = Community of N. stricta; PAST = Pasture; ANN = Annual plant pastures; FRESH = Fresh "vallicares"; DAMP = Damp "vallicares"; MOW = Mowing "vallicares"
††Values with the same letter do not differ significantly

Table 2. Effect of cutting on TDOM (kg ha^{-1})

Comm.†	Cut 1	Cut 2	Cut 3	Cut 4	Cut 5	Cut 6	Cut 7	Cut 8	Cut 9	Cut 10
NARD	986 a††	1,145 b	1,501 c	1,288 d	1,388 e	1,710 f	1,695 fg	1,804 h	1,689 g	2,336 i
PAST	754 a	847 b	975 c	1,348 d	1,329 d	1,688 e	1,628 fge	1,505 h	1,630 ge	1,670 e
ANN	176 a	231 ab	289 b	405 c	538 d	782 f	600 e	595 e	488 d	403 c
FRESH	366 a	434 a	502 b	808 c	1,607 d	1,537 d	1,979 e	2,115 f	2,074 f	1,459 g
DAMP	745 a	964 b	970 b	1,433 c	1,384 cd	2,085 e	2,086 e	2,088 e	1,627 f	1,333 d
MOW				597 a	997 b	1,061 b	1,616 c	1,441 d	1,722 e	1,874 f

†Comm. = Community; NARD = Community of N. stricta; PAST = Pasture; ANN = Annual plant pastures; FRESH = Fresh "vallicares"; DAMP = Damp "vallicares"; MOW = Mowing "vallicares"
††Values with the same letter do not differ significantly