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Horses and rangelands: Mutual contributions and perspectives

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Abstract. Horses are increasingly present in pastoral areas but little is known about their potential contribution to rangeland utilization. In order to investigate this question in the context of Southern France, a specific research project was undertaken, with: (i) a farm-scale analysis to determine the importance of rangelands for horse feeding in agro-pastoral farming systems; and (ii) a territorial analysis to identify the role and importance of horses for pastoral areas, based on inventories, spatial analysis with GIS and interviews with local stakeholders. Among the "professional" horse farms we studied, only a few feeding systems relied mainly on rangelands. On the other farms, rangeland utilization was limited due to the lack of land, equipment or pastoral knowledge. On a territorial scale, horses were rarely accepted as proper rangeland users and access of horse owners to land depended on the evolution of local ruminant farms. For a number of stakeholders, horses can help reducing land abandonment and show interesting complementarities with ruminants. Further research is needed on the interest of associating horses with ruminants for rangeland utilization on farm and landscape scales.

Keywords. Equids – Pastoralism – Feeding system – Territorial analysis.

Chevaux et parcours: apports mutuels et perspectives

Résumé. *Les chevaux sont de plus en plus présents dans les territoires pastoraux, mais leur contribution à la valorisation des parcours a été très peu étudiée. Pour apporter des éléments de réponse à cette question dans le contexte du Sud de la France, un projet de recherche-développement spécifique a été mené, comportant : (i) une analyse à l'échelle de l'exploitation pour établir la place des parcours dans l'alimentation des chevaux au sein des systèmes d'élevage agro-pastoraux ; et (ii) une analyse territoriale visant à identifier le rôle et l'importance des chevaux pour les espaces pastoraux, à partir d'inventaires, d'analyses spatiales avec outils SIG et d'enquêtes auprès des acteurs du territoire. Parmi les exploitations équines « professionnelles » enquêtées, seuls quelques systèmes d'alimentation étaient principalement basés sur les parcours. Dans les autres exploitations, l'utilisation des parcours était limitée par le manque de terres, d'équipements ou de compétences pastorales. A l'échelle territoriale, les chevaux étaient rarement acceptés comme acteurs du pastoralisme et l'accès à la terre des propriétaires équins dépendait des évolutions des élevages de ruminants locaux. Pour certains acteurs, les chevaux pourraient contribuer à limiter la déprise agricole et présentent des complémentarités intéressantes avec les ruminants. A l'avenir, il s'agira d'analyser les opportunités offertes par l'association de chevaux et ruminants pour l'utilisation des parcours aux échelles de l'exploitation et du territoire.*

Mots-clés. *Equins – Pastoralisme – Système d'alimentation – Analyse territoriale.*

I – Introduction

In the last 30 years, with the development of horse-based leisure activities, the equine sector has soared. In France, the 1 million estimated equids (REFErences, 2012) would use 5% of the permanent grasslands (REFErences, 2009) and up to 6% of the total surface area in certain rural districts (Vial *et al.,* 2011). Besides, horses are increasingly present in pastoral areas, but little is known about their potential contribution to rangeland utilization. Rangelands are lands bearing "heterogeneous natural vegetation communities with high conservation value, growing in harsh

environments and characterized by high heterogeneity in the spatial and temporal distribution of the forage resource" (Jouven *et al*., 2010).

In order to investigate the mutual contributions between horses and rangelands, a specific research project was undertaken, associating research and development institutes, pastoral services and professional stakeholders. Two complementary approaches were developed: a farm-scale analysis aimed at determining the importance of rangelands in horse feeding systems, and a territorial analysis aimed at identifying the role and importance of equids for the pastoral areas, as seen by the various territorial players. This article presents the major results of these two studies and puts them into perspective.

II – Rangelands can feed horses … if the system is designed for it

In Southern France, grazing rangelands is altogether a tradition, a means to produce hardy animals and a low-cost feeding system. We investigated two contrasted systems: (i) the Camargue farms, where horse breeding is traditionally practiced in association with cattle; (ii) the Endurance farms in the Causses. Endurance farms in this area have been introduced recently (end of the 20th century), with the development of endurance as a sport, in pastoral areas traditionally exploited by sheep farms.

1. Material and methods

In 2011, a dozen farms per system were investigated, following the method "functional analysis of feeding system" developed in the 1980s by the Institut de l'Elevage (Moulin, 2005). We selected farms with 5 or more mares, including a pastoral component (rangelands and grazing). The 12 Camargue farms investigated exploited on average 350 ha of land of which 74% rangelands (mainly marshes and salted pasture) with 59 horses. The 11 Endurance farms investigated used on average 240 ha, of which 79% rangelands (mainly dry open pasture) with 43 horses. Farms widely differed in terms of total surface area (25 to >1500 ha) and, to a minor extend, herd size (20 to >100 horses). Farms usually diversified their sources of income, mainly with equestrian activities.

For each animal group, we estimated the contribution of grazed forage (grazing ratio) and more specifically of rangelands (pastoral ratio) to the feeding system. With reference to a whole year, we calculated the percentage of days where animals were fed on such resources. This percentage was corrected as a function of supplementation. The ratios at farm scale were obtained by averaging the ratios for animal groups, weighed by their size and time of presence.

2. Rangelands can provide up to 85% of horse feed requirements

Based on grazing and pastoral ratios (Table 1), the farms of each system were divided into three groups: (P+) included farms with large areas of rangelands and the highest pastoral ratios (≥60% of feed grazed on rangeland at farm scale); (P) included farms with high grazing ratios (40-98%) but lower pastoral ratios (25-60%) due to a significant contribution of either grazed grasslands or forage and concentrate supplementation to the feeding system; (P-) included the least pastoral farms, which made little or no use of their rangelands.

Within the farms, the highest pastoral ratios were for the young and the mares (Table 1), while in (P) and (P-) farms the mounted horses were fed almost exclusively on conserved feed and kept close at hand to be easy to catch. The high pastoral ratio of (P+) farms seemed to be due both to the secured access to a large surface area of rangelands and to the deliberate low-cost and rangeland-based feeding strategy of the farmer. In (P) farms, the lower pastoral ratio could be explained by a precarious access to rangeland associated with a lack of pastoral equipment and/or the belief that rangelands (compared to grasslands) were no decent forage resource. Grazing in (P) farms was mainly limited by land availability and disputes between neighbors.

Table 1. Grazing and pastoral ratios, with basic information about farm structure, for the three farm types (P+: very pastoral, P: with pastoral component; P-: almost no pastoral component) and the two types of farming systems (C: Camargue; E: endurance)

Type of farm	P +		P		P-	
Type of system (nb farms)	**C** (5)	**E** (3)	**C** (5)	**E** (5)	**C** (2)	**E** (3)
Total surface area	311	373	521	221	35	131
Rangelands/total surface area	83%	90%	84%	84%	23%	58%
Herd size (nb horses)	77	55	51	33	36	47
Mares and young† / herd size	65%	45%	47%	58%	47%	46%
Grazing ratio (whole farm)	82%	71%	70%	51%	50%	27%
Pastoral ratio (whole farm)	**68%**	**69%**	**46%**	**38%**	**0%**	**12%**
Pastoral ratio (mares)	83%	60%	62%	35%	0%	11%
Pastoral ratio (young†)	85%	81%	64%	57%	0%	23%

† Young: weaned young horses before breaking in (from 6 months to 3-4 years old).

III – Horses against agricultural abandonment in pastoral areas

The territorial impact of horses was studied in the Cevennes National Park, which has a strong pastoral tradition in dairy and meat sheep farming. Equine activities in the Park were introduced at the end of the 20th century, and occupied the areas abandoned with the decline of ruminant farms.

Our investigations aimed at characterizing equine activities in the Park, with their territorial impact, and the perception of such activities by local stakeholders.

1. Material and methods

Information was gathered from existing databases about equine activities, and expert knowledge of Park guards. Such data were completed with a postal survey, then analyzed with GIS software to determine the type of equine activities in the Park and the factors explaining their spatial distribution (results not presented in this paper).

Fifty-seven interviews were carried out during the spring and summer 2013, with: equine farmers and equestrian structure owners (33 persons interviewed); non-equine farmers (7); elected representatives of equine activities (3); people of pastoral and agricultural technical services (3); employees of the Cevennes National Park (3); employees of tourist information centers (3); others (5). The interviews consisted in a discussion about: a) the perception of rangelands, b) the local impact and evolution of equine activities, c) the interactions between equine activities and local stakeholders and d) the opportunities and drawbacks of equine activities for the area.

2. Equine activities suffer from a negative image

Most local stakeholders consider that equine activities bring little or no contribution to the local agricultural, ecological, and economic dynamics. This opinion is probably a result of the poor integration of equine farmers into the social and technical agricultural environment and of the image of luxury associated with horse owners and the cost of horse riding (especially for Endurance horses, which attract each year visitors from the Arabian Emirates). Moreover, equine activities have mostly been set up by newcomers and are mainly practiced by the urban population. Although most equine farms in the Park use large areas of rangeland, many stakeholders associate horses with land degradation, based on the image of amateurs keeping their animal all year round on the same small paddock. As a consequence, landowners prefer to work with ruminant farmers and access to land is particularly difficult for equine farmers. Though, most equine farmers develop a good relationship with the neighboring farmers.

3. Actual contribution of horse-based activities to pastoral areas

Most equine structures in the Park are diversified (farming +/- tourism +/- equestrian activity) in order to cope with the unpredictability of horse sales, the short touristic season, and the low population density. The spatial distribution of equine activities can be explained by the recent evolution of ruminant farms, and suggests that horses can help fighting land encroachment by using the rangelands abandoned by ruminant farms. For example, endurance farms have developed in the Causses on the land abandoned by sheep farms.

The stakeholders with the broadest territorial views cited a number of positive impacts of equine activities. Horses can be a means to create social links between rural and urban populations. They can also contribute to the touristic and economic dynamism, provided that they are well organized at large scale (ex. asine tourism in the Cevennes). Finally, pastoral services and a number of equine and non-equine farmers recognize the contribution of horses to the ecological preservation of open rangelands and their complementarities with ruminant species in terms of feeding behavior and preferences.

IV – Conclusion and perspectives

Horse numbers grow, and equine activities increasingly take part to the agricultural, socio-economic and ecological dynamics in rural and peri-urban areas. This work has contributed to the establishment of references about equine activities in pastoral areas of Southern France. Our results suggest that horses and horse-based activities can contribute significantly to the provision of ecological and socio-economic services in pastoral areas. In order to achieve this, equine farmers should be: (i) better integrated into the agricultural sector; (ii) considered as proper rangeland users; and (iii) provided with technical support in order to encourage rangeland-based feeding systems. Further research is needed to investigate the interest of associating horses with ruminants for rangeland utilization at farm and landscape scales.

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