

Local animal resources and products in sustainable development: role and potential of equids

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Summary

The production of Equids in Europe is oriented towards sports and races which constitute the main economic activity. However, the preservation of old draft breeds of local horse populations and the growth in the population of asses in recent years are emerging fields. The main reason for this situation is the very deep-rooted image of equids in the culture of the industrialised countries, generating both non-material products and socio-economic benefits.

Equids are still multipurpose animals. They contribute to:

- the diversification of agricultural activities, products (production of riding horses, meat, and more rarely milk) and labour (ploughing, loading timber in the forest, harnessing, carriages);
- the utilisation of extensive areas (marginal lands) and the preservation of natural areas (natural parks or reserves);
- the development of agritourism in equestrian farms located in marginal and suburban areas.

All these activities contribute to the maintenance of population in rural areas, the creation of new relationships between citizens and the rural way of life, the preservation of rare breeds and traditional socio-cultural life and, in addition, to the supply of some animal products. The contribution of equids to such socio-economic activities is illustrated in this report by case studies of seven European countries.

Keywords: equids, multipurpose, sustainable development, Europe.

Introduction

It is commonly believed that the breeding of equids in Europe is oriented only towards sports and races, which constitute the main economic activity, the so-called horse industry. Nevertheless, equids are multipurpose animals and this fact has emerged particularly in recent years. At present equids play a significant role in the exploitation of marginal lands. They can generate both non-material products and socio-economic benefits from different kinds of activities such as the development of agritourism with saddle horses or carriages. As far as environment preservation is concerned, the recent exploitation of certain products, such as equine milk for human consumption and use (cosmetics), could contribute to the preservation of animal biodiversity or/and could also positively influence the micro-economy of marginal and hilly areas, where the total number of residents and raised animals is decreasing, with

consequent problems of forest fires, soil erosion and desertification. Another kind of exploitation of marginal lands has also emerged recently in some European countries: the production of asses and mules. In fact, the need to save breeds of asses from the risk of extinction and to find alternatives to the use of agricultural machines in deforesting and tree cleaning, necessitated the study of the possibility to obtain profit-related economic advantages from these kinds of production. All these different horse-related activities also influenced horse meat production that is actually becoming the second choice in horse farming after the above-mentioned productions.

This paper aims at highlighting:

- the role of husbandry of Equids in terms of activities (rearing and farming), in terms of economic activity (production and utilisation), and in relation to the several dimensions of agriculture;
- the multiple and interactive use of Equids, which goes far beyond the classical scheme of an animal commodity chain.

Contribution of equids to sustainable or rural development

Equids play an important role by contributing to:

- the diversification of agricultural products and activities (production of riding horses, meat, milk, and work activities including harnessing, ploughing, forestry and carriages);
- the sustainability of extensive areas (marginal lands) and preserved areas (natural parks);
- the development of agri-tourism in equestrian farms located in marginal areas or closer to urban centres;
- the development of sporthorse and racehorse breeding in extensive pasture areas.

In this context, equids meet also the most important expectations of modern society which are multi dimensional:

- preservation of the environment, the landscape and the output from grassland;
- preservation of livestock biodiversity;
- relationship of citizens with cultural rural life;
- preservation of traditional socio-cultural life;
- economic and territorial values.

Preservation of environment, landscape and output from grassland

Grass and preserved forages account for 50 to 80 percent of the feed of horses in a year. Forages can supply 40 to 70 percent of the horse's annual feed requirements. Differences can be noticed according to location and management of horse feeding areas. In humid temperate mountains and/or rangelands of France (Massif central, Pyrénées, Limousin), husbandry systems with heavy mares bred outdoors for producing young colts for fattening are frequent. For nine months animals are fed on grass close to the farms in early spring and late autumn, and on highlands in the summer. Small amounts of preserved forages and concentrates are provided during the winter in late pregnancy (Figures 1 and 2). The colts can be reared on such land to be slaughtered either at weaning, when they are born in very early spring (but the mare has to be supplemented), or later on, at 30 months of age (Figures 1, 2 and 3). In the later case the colts can also be fattened in the lowlands (i) within a feed-lot system using hay or again grass or maize silage-based diets, supplemented with 5 to 40% of concentrate according to the nutritive value of forages and/or age at slaughter; (ii) on grass alone, within grazing systems in which they can be associated with beef or dairy cattle (Figures 2 and 3). Seventy to eighty foals are weaned per 100 mares mated (Lienard & Martin-Rosset, 1984). Similar systems are implemented with dual purpose horses in Italy: in the Molise region close to the Abruzzo mountains with Pentro Horses (Miraglia *et al.*, 2001); in the Marche mountains with Catria horses (La Manna *et al.*, 2002); in the regions of Veneto and Trentin

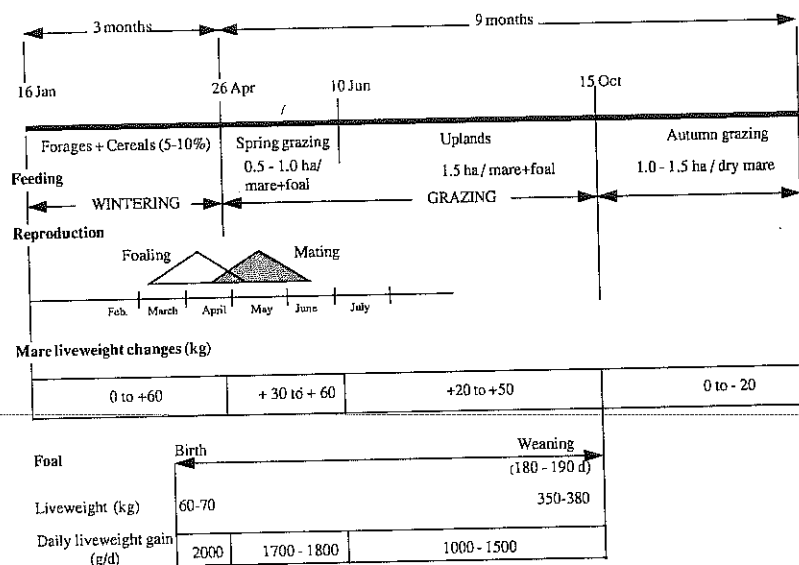


Figure 1. Management of heavy brood mares in upland harsh conditions in the centre of France: Auvergne region (adapted from Martin-Rosset & Trillaud-Geyl, 1984, quoted in Micol & Martin-Rosset, 1995).

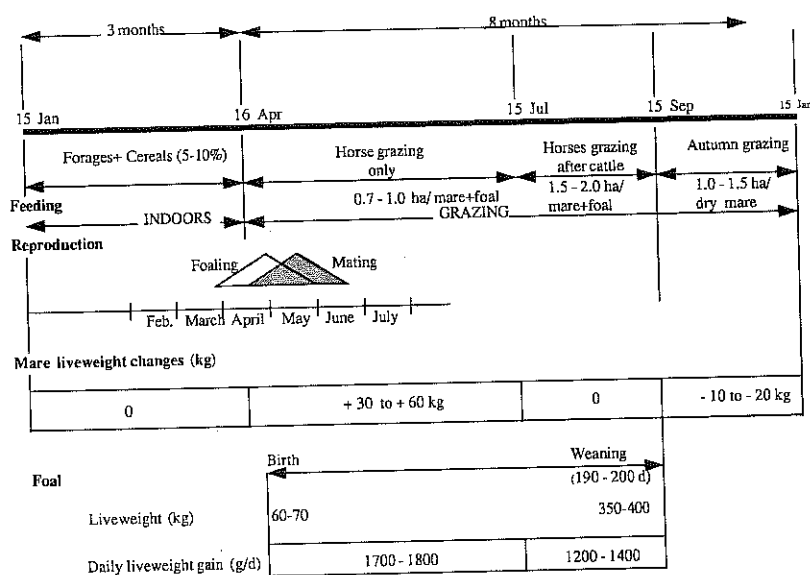


Figure 2. Management of heavy brood mares in grassland and temperate zones: centre west of France, Limousin region (adapted from Martin-Rosset & Trillaud-Geyl, 1984, quoted in Micol & Martin-Rosset, 1995).

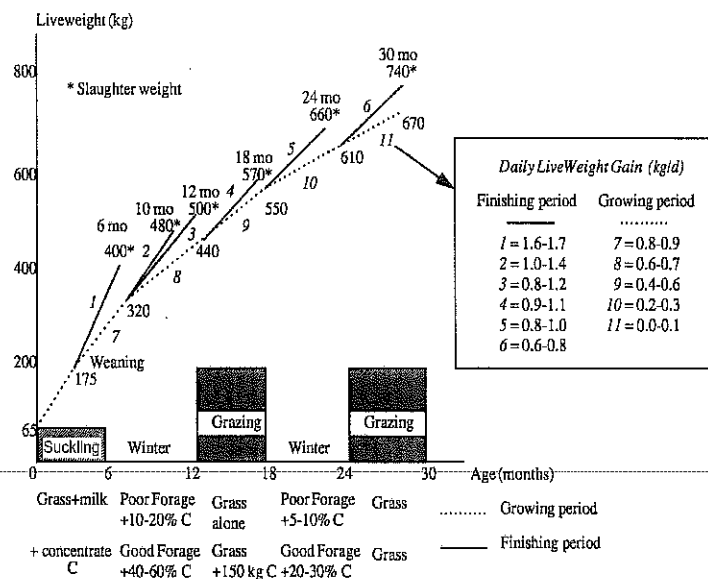


Figure 3. Feeding management and body weight of colts in the main finishing systems of heavy horses (INRA, 1990, quoted in Micol & Martin-Rosset, 1995).

close to the Dolomite mountains with Haflinger horses and in other Italian regions such as Sardinia and Sicily (Giara ponies and Sanfratellano horses respectively); in Spain, in the Pyrenees mountains with Galego horses (Santamarina, 2000); in Switzerland, in the Jura mountains and other Pre-alpine zones for breeding Franches Montagnes horses (Röger-Lakenbrink, 1997); and in Iceland for breeding Icelandic horses (Gudmundsson & Dyrmondsson, 1994). In all these areas horses graze mostly on rangelands during the summer season, either on their own or with beef cattle or dairy heifers mainly (Micol & Martin-Rosset, 1995; Miraglia *et al.*, 2002; Fed. Suisse d'Elevage, 2002) or with sheep (Gudmundsson & Dyrmondsson, 1994). The horses contribute significantly to pastoral management and improve sward biodiversity and pastoral value (Loiseau & Martin-Rosset, 1985, 1989; Gudmundsson, 1995; Miraglia *et al.*, 2001, 2002; Fleurance *et al.*, 2003). Similar systems are traditionally applied also in Ireland for pony production in Connemara (Petch, 1998), and in UK, Finland (Saastamoinen, 2003), Norway, Iceland, Austria and France for the production of New Forest ponies, Fjord, Icelandic, Haflinger and half warm-blood horses respectively, used for hacking and trekking activities. In small-scale forestry, horses are also used for removing seed trees and wind-thrown timber in harsh zones (Finland: Majjala, 1999; South Germany: Bade Wurtemberg, France: Morvan area). The most common breeds are North Swedish, cold-blood breed in Sweden, Fjords or Dole in Norway, Finnhorses in Finland, Franches Montagnes horses in Switzerland, Ardennes in Belgium, Comtois, Bretons and Ardennes in France. Mules are often used in Spain, Italy and Portugal (EU Equus, 2001).

In the lowlands of temperate zones, horses used for sports, the so-called warm-blood breeds (Clarke & Wallin, 1992), or races (trotters and thoroughbreds), have been produced for many decades in different European countries. Feeding systems are based on grass. Preserved forages are extensively offered to mares (Figure 4) and growing horses, with the more or less use of compensatory growth during the summer season (Figure 5). Horses are routinely combined with ruminants: beef cows, heifers or steers in France (Selle Français and French trotter in Normandy), cattle and sheep in Ireland (Connemara in

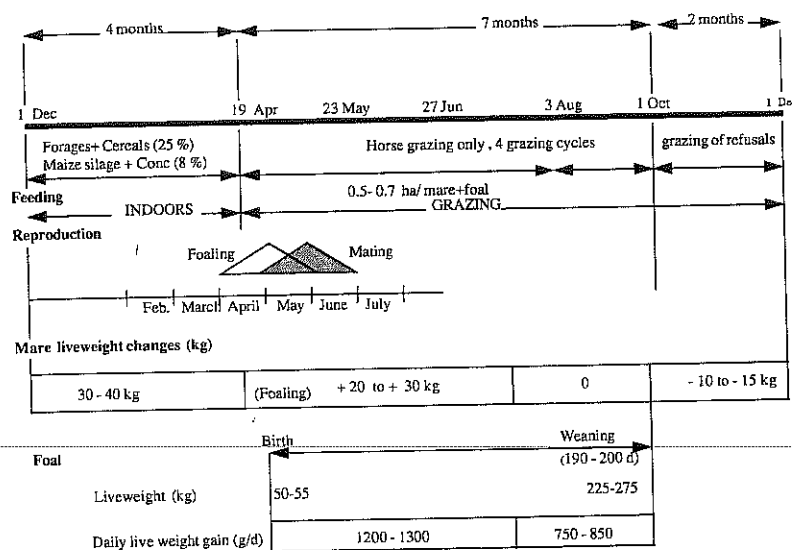


Figure 4. Management of saddle brood mares in grassland temperate conditions: centre west of France: Limousin region (adapted from Institut du Cheval, 1987, quoted in Micol & Martin-Rosset, 1995).

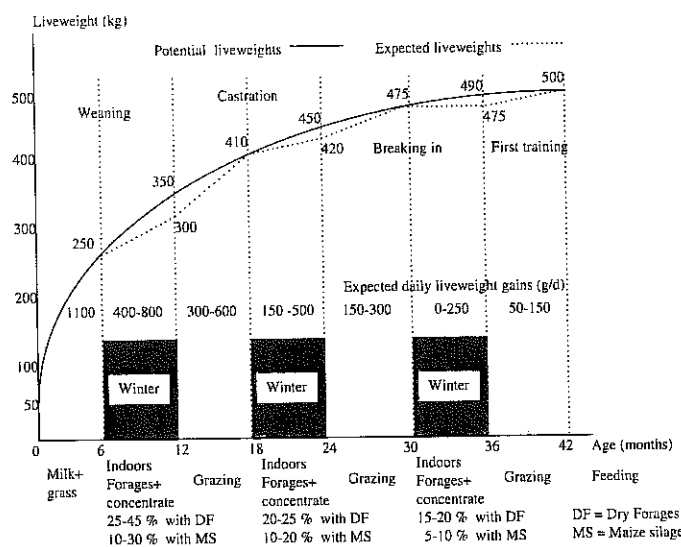


Figure 5. Feeding management and body weight curve in growing saddle horses (INRA, 1990, quoted in Micol & Martin-Rosset, 1995).

the West and Thoroughbreds in the South and East), dairy cows or heifers in The Netherlands (KWPN breed), in Germany (German warmbloods: Trakehners, Hannoverian, Holstein, etc.), in Switzerland (Franches Montagnes horses and Swiss warmblood), in Belgium (Belgian warmblood), in Denmark (Danish warmblood), in Sweden (Swedish trotter and Swedish warmblood horses), in Poland (in the North: Wielkopolska breed; and in the Southeast: Malopolska breed). More rarely horses are alternated with sheep. In the Mediterranean and in some European countries equids are used for agricultural work: ploughing and transportation in terraced hillsides and muddy river valleys (EAAP, 1995).

Experiments conducted in France with horses and cattle or sheep (Martin-Rosset *et al.*, 1984; Loiseau & Martin-Rosset, 1985, 1989) and in Iceland with horses and sheep (Gundmunsson & Dyrmondsson, 1994; Gudmunsson, 1995) showed that horses are able to graze the proportion of grass that ruminants cannot graze due to their grazing behaviour: height of grazing related to the absence of incisors, and higher selectivity towards botanical species in the sward, namely for sheep. Moreover, horses can also clean the land, either early or late in the grazing season, by grazing the ungrazed grass left by ruminants during the previous summer. This system is frequently implemented with herds of mares of heavy breeds in France (Massif Central: Martin-Rosset & Trillaud-Geyl, 1984; or Jura areas) and in Italy (Abruzzo: Miraglia *et al.*, 2001). Ponies or light horses bred for trekking are often wintered on such land, keeping it clean and productive (Connemara in Ireland, Icelandic horses in Iceland, New Forest in UK, Fjord in Norway, heavy breeds in France and Italy). In nature conservation areas, horses are combined with cattle in order to maintain biodiversity (Duncan, 1983, 1992; Putman, 1986; Gordon, 1989b; Putman *et al.*, 1991; Menard *et al.*, 2002) and also to preserve wild life in the territory (Duncan, 1992) and promote socio-cultural activities in and around natural parks. In France, Camargue horses are managed with cattle destined for bull-fighting in the Camargue National Park (Duncan, 1992).

In Italy, Maremmano horses are used for trekking in the Maremma Regional Park (Bonavolontà & Silvestrelli, 1989). Similarly, Sanfratellano horses are used for trekking in the Regional Park of Nebrodi in Sicilia (Liotta *et al.*, 2002). In Ireland, Connemara ponies are used for hacking and trekking in the well preserved Connemara area. Haflinger, Franches-Montagnes, Fjord and Silesian horses are used likewise in Austria, Switzerland (Röger-Lakenbrink, 1999), Norway and Poland respectively.

In all cases horses contribute to the output of grasslands in terms of animal production, pastoral management and landscape, and profitable use of the available infrastructure. A recent study of the European Commission (2000) has estimated that 3.3 to 3.9 million hectares are used for feeding horses, that is, 2.6 to 3.3% of total utilised agricultural area in EU-15, which is to be compared to land use for rapeseed (2.1%) and sugar beets (1.6%). This is a significant fact taking into consideration the decrease in other animal productions (EU Equus, 2001).

Preservation of livestock biodiversity

The preservation and exploitation of livestock biodiversity is becoming an important issue in animal science. Each breed is characterized by its own genetic characteristics depending on adaptation mechanisms developed in centuries of evolution and influencing productive capacities and performances. In the last decades, intensive breeding determined a considerable loss of genetic biodiversity. However, in Europe and some Mediterranean countries many equine breeds exist that occupy special niches and contribute to the protection of biodiversity. For instance, a great variation in body size and adaptability is still maintained among horses raised for leisure activities, such as between Polish Konik (ex Tarpan) and Thoroughbred or between Shetland and Percheron. There is also a very large diversity in relation to abilities. For example, between racing trotters and Icelandic Toelters or between French Jumpers and German dressage horses. Some rare breeds like Lipizzaner, Kladruber, Dulmener Ponies, Hackneys, and Poitou asses, are being saved from extinction thanks to the passion of many horse lovers. Some years ago, a study attempted to assess the possibilities for funding the preservation mainly of draught horses (Rossier *et al.*, 1986). We can now conclude

that the leisure society with its high standards of living has found the economic means to preserve biodiversity.

Autochthonous populations need to be re-evaluated because they contribute to: the exploitation of marginal and low productivity areas; environmental protection; recovery of traditional culture; improvement of the "typical" products market; and diffusion of rural tourism. Switzerland has implemented a programme to ensure the survival of the Franches Montagnes breed in accordance with international regulations. Local breeds like Icelandic Toelter, Haflinger, Lipizzaner, Merens and Connemara tend to reach a worldwide standard, like Thoroughbred and pure bred Arabian, with international conferences for the management of Stud-Books. Other breeders prefer to maintain their local trademark image and ignore the export market. Yet, a lot of them like trotter and sports horse breeders, are indecisive between these two extremes. Moreover, autochthonous populations can be valued also as sources of genes, some of which have been completely or nearly lost in the cosmopolitan breeds; for example, the Tarpan breed in Poland that underwent extensive crossbreeding with breeds from Western and Central Europe, Oriental countries and Central Asia to breed Wielkopolska and Malopolska breeds.

Relationships between urban citizens and cultural rural life

Equids represent a considerable attraction for urban citizens who are increasingly interested in the rural way of life, keen to rediscover uncontaminated wild lands, or are interested in equids' educational and therapeutic functions. The presentation of various breeds in the framework of shows and sales used to gather a huge number of farmers, non farmers, breeders, representatives of breeding societies, friends and supporters of the breeds. For example, the Clifden Connemara show, organised on the third Thursday of August since 1924 in Ireland, gathers 400 ponies and thousands of people from all over the country and from abroad as well. This kind of tourism is becoming more and more diffused as confirmed by the increasing number of horses bred for this kind of ability and also equestrian farms with facilities available for hosting a rising number of tourists. This is particularly relevant in those agricultural areas where in recent years land has been abandoned by farmers because of lack of economic advantages from other animal production and/or traditional agricultural exploitation. Equestrian agri-tourism is now professionally organised and proposed through a commercial network. Horses have an important role in the marketing of such districts (in France: Camargue area, Dome district; in Italy: Maremma district, South Abruzzo area, Nebrodi park in Sicilia, Giara district; in Switzerland: Grison and Glaris Alps; in Austria: Tyrol; in Ireland: Connemara district). The role of horses in such areas is similar to that of sailing activities on the seashore or ski activities in the mountains. Horses are also increasingly used for education and equestrian rehabilitation. These activities are frequently combined and/or complementary with other farming activities dedicated to animal production or also sometimes with other leisure activities: agricultural services, for example weekly management of riding horses on the farm, for riding by urban citizens during the weekend, or accommodation for walkers and/or riders. A study conducted in England and Wales on agricultural holdings pointed out that equine-related activities were the third largest enterprise after agricultural services and accommodation (McInerney & Turner, 1991 quoted by EU Equus, 2001). This situation should be even more favourable in the very near future as a positive significant relationship has been found between consumption level and the number of horses per inhabitant (Eurostat, 2000b).

Preservation of traditional socio-cultural life

Equids represent a strong, positive image for people because of the strong historical link between equine breeds (horses and asses) and particular geographical and/or ecological areas in some countries. This image contributes actively to the preservation of local historical buildings like castles and abbeys that

are transformed into stud farms. It therefore plays a significant role in building a local trademark image that is valorised by tourism. Examples are given by Le Pin and Pompadour Studs in France, Einsiedeln in Switzerland, Flynge in Sweden and many others. In Switzerland, the Franches Montagnes horses have traditionally been an important part of socio-cultural life. They are the focus of many traditional events highlighting the rural scene. These activities are of particular significance in the traditional centres of Franches Montagne breeding and equestrian activity (Avenches, Bellelay, Agasul, Berne, Saignelégier), where they also contribute to social cohesion amongst Swiss counties (Federation Suisse d'Elevage, 2002). We have already mentioned the Clifden show in Ireland which is part of the identity of the Connemara county. In France, typical Camargue equestrian games contribute to the specific image of this region. Let us also cite some Italian shows such as the Giara ponies' races and shows in Sardinia and the Palio of Siena in Tuscany, and the superb equestrian bullfight of Portugal where the animal is not killed and where the Lusitanian horse shows its abilities.

Horses could be used as mediators between the economical and the socio-cultural valorisation of the environment. In most cases, horses are bred in extensive areas. Horse breeding can also represent a considerable source of non-material values and an image that could be intended as a "trademark". In fact, this mark is supported by the development of pleasure activities such as tourism, stud farms, specialised craftsmanship (saddlery, farriers, etc.), artistic features (painting, sculpture, photography, movies, theatre, for example Zingaro's theatre in Paris, etc.). These activities can be well developed in our society when historical and symbolical aspects of horses are well known. From this point of view, horse sports could be considered as a symbol of arrogance because they involve competitions that represent war; on the other hand, other equids such as asses are a symbol of humbleness and submissiveness. Between these two extreme situations, there are many intermediate ones that include draught horses, ponies, hacking horses, etc. Thus, a major concern is to fit the different situations of horses in their right place to avoid marketing mistakes.

Equids and socio-economic issues

All the aspects mentioned above match a number of socio-economic advantages concerning direct and indirect profits. They mainly concern:

- employment;
- quality of products;
- development of breeding strategies in the context of sustainable agriculture.

Employment

The equid commodity chain generates employment, part- and full-time, at different levels and often very different in typology. Horse breeding systems for sports and leisure involve zootechnical practices as for other domestic herbivores. In addition, many other activities are linked to horse breeding, for example horse breaking, breeding shows for mares and progeny, competition in horse events for young horses, etc. These different tasks are often carried out by different people as they require some expertise. Thus, this commodity chain needs specialised professionals (equine veterinarians, horse nutritionists, farriers, riders, grooms, horse breakers, head lads, etc.) or specialised industries (equine veterinary products, horse clinics, specialised feeds and supplements, artificial insemination organisations, etc.). An increasing number of women are also involved in such jobs, many more than in other types of jobs (Digard *et al.*, 1999; Toure-Malen, 2004).

This commodity chain generates various levels of employment in the different countries of Europe. In this case, these specialisations involve direct profits. Other profits that depend directly on equids' breeding come from specialised horse equipment (saddlery, horse harnessing, studs, various accessory

etc.), specialised riding equipment (clothing industry, etc.), service companies, specialised press, specialised corporations, etc. All these activities generate a wide productive and trading mechanism. This means that the economic advantages coming from equids bred in traditional breeding systems, including landscape exploitation, can be compared to the benefits derived from more traditional livestock products (milk, meat, etc.). Finally, it is important to underline all the by-products derived from horse breeding: equestrian shows and promenades, riding schools and betting. In this last case, a pleasure activity carries considerable economic advantages for horse breeding because a quota of betting receipts is destined to improve horse breeding and specialised activities.

Quality of products

In recent years the considerable diffusion of equid breeding underlines the important role of these animals in the exploitation of marginal and hilly areas and the potential economical advantages coming from the different kinds of production. The exploitation of certain products, such as equine milk for human consumption and meat production, could contribute to the preservation of animal biodiversity on the one hand, and on the other hand to the micro-economy of these areas, where the total number of residents and raised animals is decreasing, with related social problems of forest and woodland fires, soil erosion and desertification. Traditionally, human consumption of both mare milk and ass milk has stimulated some interest because of its supposed nutritional and therapeutic properties (Doreau *et al.*, 2002). Recent results from microbiological studies point out that ass milk is an excellent base ingredient for probiotic food preparations because of its positive qualities, such as low microbial counts, high lysozyme content and optimal composition as a growth medium for useful lactic acid bacteria (Coppola *et al.*, 2002). It should also be mentioned that the utilisation of mare milk in Western Europe is developing not only as a functional food but also for dermatological purposes. Besides this, more recent clinical studies confirm ass milk feeding as a safe and valid treatment in the cases of multiple food intolerance in infancy (Carrocio *et al.*, 2000).

From a zootechnical point of view, preliminary investigations on equine milk have been carried out successfully by many authors (Doreau *et al.*, 2002). Horse meat production is diffused in France, Italy and to a lesser extent in Spain as a specialised production, and in some eastern and western European countries (Germany, UK, Ireland and Poland) with different breeding typologies connected with the availability and quality of grass and forages, depending on the extensive systems in which the horses are managed. There is a rising interest for this product due to the well known vicissitudes that have arisen from the BSE problems in cattle and thanks to the nutritional qualities of horse meat. Horse meat is known to have a low lipid content, namely in unsaturated fatty acids, a high content in protein and amino acids; and finally, the meat is not suspected for any contamination (Martin-Rosset, 2001).

Development of breeding and farming strategies in the framework of sustainable agriculture

A good exploitation of marginal zones and grasslands depends not only on technical factors, but also on the recovery of these areas by farmers in the framework of sustainable agriculture and, more recently, in the framework of rural tourism development. Horse breeding is actually more and more diffused in the exploitation of landscape because of the different products available, such as milk or meat, but mainly due to the increasing demand of horses for hacking. This situation contributes to the valorisation of all the agritouristic resources with significant economical advantages coming from a touristic offer which might be competitive with other activities associated to sustainable agriculture. In this context, there is a new challenge for multipurpose breeds in the different European countries concerned: Italy (autochthonous equine populations: Murghese, Tolfetano, Sanfratellano, Catria, Salernitano, Persano and Maremmano horses; Bardigiano, Avelignese, Giara and Esperia ponies; Martina Franca, Ragusano,

Amiata, Sardo and Asinara asses; Figures 6 and 8), France (Camargue, Merens, Pottock, old type of Anglo Arab, some heavy breeds), Switzerland (Franches Montagnes horses; Figure 7), Finland (Finnhorses), Austria (Haflinger), Poland (Silesian, Malopolska breeds), Norway (Fjords and Dole), Ireland (Connemara), UK (New Forest), and Iceland (Icelandic). All these breeds are subjected more or less to new genetic management not only for preserving the genetic resource but also for meeting the new demand. Such activity is becoming more and more interesting in the Mediterranean countries (Italy: Miraglia *et al.*, 2001, 2002) as well, both for the economical advantages they provide to breeders and the protection of landscape they ensure for the benefit of the community, as far as mule production is concerned. Mule production now represents a significant economic source for breeders. In fact, the new agro-environmental regulation concerning forestry will give a new impulse to the use of crossbreeds and will consequently contribute to the genetic safeguard of some equine populations at risk of extinction (mainly asses). Economic advantages connected to horse activities are consistent with the protection of nature and cultural origin. As a result, horses are a significant actor in the sustainable agricultural development of certain regions. They promote these regions through their involvement in agritourism, by contributing to valid, alternative ways of utilising local agricultural resources and the preservation of landscape quality.



Figure 6. Map of Italy and diffusion of equids in Central-Southern Regions (Miraglia *et al.*, 2002).

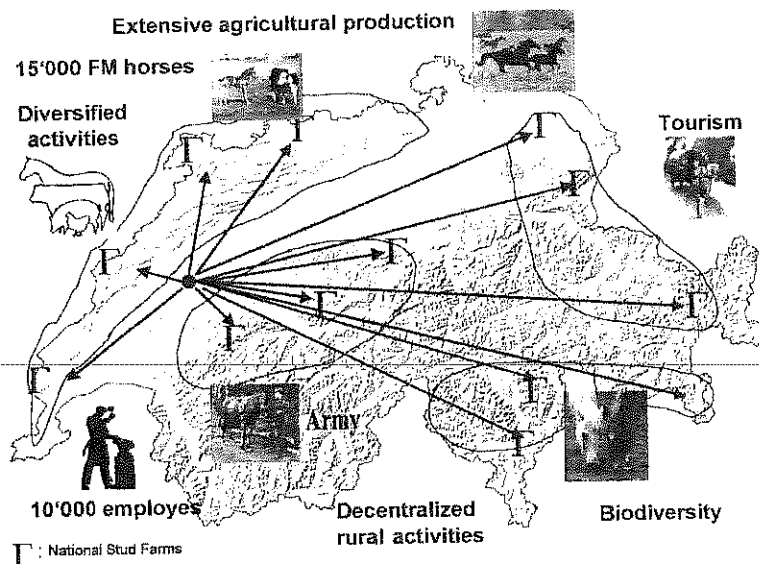


Figure 7. Contribution of the Franches Montagnes breed to the territory management in Switzerland.

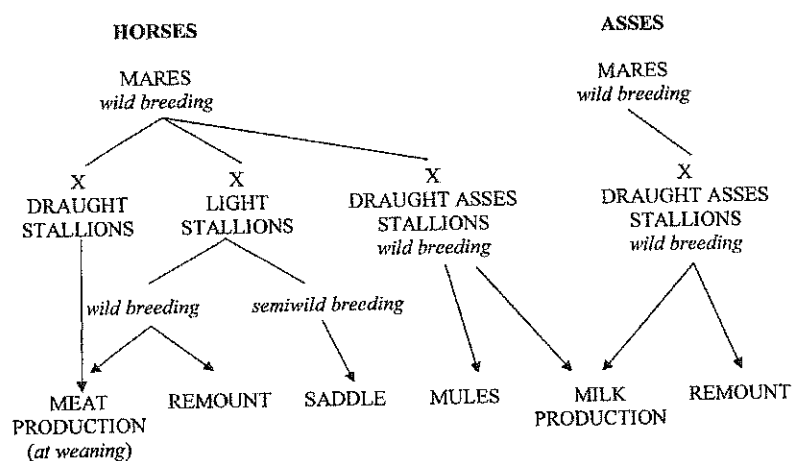


Figure 8. Equids are multipurpose animals: an example in Southern Italy (Miraglia et al., 2002).

Discussion

Ethical aspects

There are not many ethical problems regarding horse use and production. The horse has been traditionally respected, and we should be careful to continue this tradition. At the breeding level, some pasture systems could involve certain welfare problems related to the lack of forages and watering places, generally influenced by overgrazing and environmental degradation. The problem of doping (growth hormone) is of considerable importance in horse breeding also where there is a need to fight vigorously against all kind of non-ethical tempting tool. In the same field, horse meat consumption represents a necessity for some, while it is unacceptable for others. Furthermore, betting on horse races is often the object of condemnation, the latter being unfounded as horse races allow to control the betting that would otherwise remain totally underground.

Socio-economic aspects

In Europe, agricultural policy is more and more focused on the concept of global management and on the promotion of sustainable agriculture. The so-called "second pillar" of the common agricultural policy aims to guarantee the future of rural areas, including social as well as economic needs (European Commission, 2001 quoted in *Equus*, 2001). In this context, the production and utilisation of equids can make a significant contribution to this new challenge. The equine industry is facing a rising socio-economic demand, which can be met by the diversified production and utilisation of equids. Equids are bred for work: races, sports, hacking, forestry, agritourism, socio-cultural events, equestrian rehabilitation. They are also involved in pastoral management providing animal output (horses bred for work or meat/milk) from grassland and they contribute to the preservation of biodiversity and landscape.

Equids are also significant for the development of ecological farming methods. They contribute to maintaining population in rural areas, as they provide complementary incomes and maintain traditional cultural events that highlight the rural scene. Moreover, urban citizens find in equids a way to experience again the rural way of life and/or to practice new sports or leisure activities in the margins of towns and/or in the countryside, even in natural parks. Finally, horses constitute a global approach in the valorisation of heritage. This evolution is supported in some European countries. In France, a new concept has been developed: the Contract for Land Use or CLU (in French, *Contrat Territorial d'Exploitation CTE*; Anonym, 2001), in the context of an agricultural act passed by the Parliament on 9 July 1999. In this act, the different functions agriculture provides in and for the benefit of society are stated. This CLU is the major tool for implementing such an original framework.

Full and part-time farmers ready to be involved in agricultural practice that preserves the environment in the context of a project of socio-economic development, are supported by state funding if they fit the criteria before and during the contract. The idea is as follows: if agricultural systems provide benefit to the society, benefit which cannot be entirely paid by the market, a financial contribution from society is required as a compensation. The National Stud, an organisation of the French Ministry of Agriculture, is in charge of sustaining the implementation of such a framework for the equine industry. In Switzerland, the Franches Montagne breed is well supported by the Swiss National Stud farm in Avenches. This federal organisation provides strategic, logistic, operational and technical support to the farmers and horse breeders in all aspects of the horse industry, as the horses are part of the territory management (Figure 7, Poncet, 1992; Weiss, 1999; Poncet, 2001; Féd. Suisse d'Élevage du cheval de la race des Franches-Montagnes, 2002).

In The Netherlands, there are currently several development policies involving horses, as the latter are seen as part of the landscape and farmland for equine activities (Ministry of public housing, spatial

order and environmental management, 2001). In Italy, the various equids bred for diversified purposes are increasingly taking part in territory management, as shown in Figure 8 (Miraglia *et al.*, 2002). In Italy the UNIRE (Unione Nazionale Incremento Razze Equine) is in charge of supporting equine breeding, concerning mainly sport horses (races and equestrian competitions); the financial support for improving breeding is constituted by a quota coming from betting; in the case of autochthonous populations, the technical and financial support for breeding is guaranteed by the Italian Breeders Association (AIA) and, in the case of populations considered at risk of extinction, by special EEC funding. In Nordic countries, horse breeding and management are supported to some extent as well. In Finland, special support from the State and/or EU is provided for original breeds and for horses used in landscape preservation or as an alternative to grass silage production with grazing (Saastamoinen, 2003). In Norway, an important tradition is the mountain grazing system, whereby mares are managed with approved stallions doing free mating in areas administered by the NHS (Norks Hesteavlsseter). This system is heavily subsidised in the context of the annual support of horse breeding activity in the country. (NHS, 1996; Kvam, 1996). In Ireland, the keeping of local breeds of horses (Connemara and Irish Draught) is financially supported under the EU Rural Environment Protection Scheme, while the breeding of sport horses is supported by public funds through a State grant given to the Irish Horse Board.

Prospects for research

The role and potential of equids could not be maintained and extended without very active research. Research on equids has been carried out since the seventies in Europe (France, Germany, Sweden, Finland, Denmark, UK, Poland and Italy), it is now emerging in Belgium, Ireland, Norway and Switzerland. Research has contributed to raising fundamental knowledge on horses to the same standard level as for other farm animals. But new challenges for research are emerging as equids are now considered as significant socio-economical actors in the society of the 21st century.

Multi-disciplinary research is now needed to evaluate the impact of equids on farming, agri-tourism and/or preservation systems, to improve the use of equids, and to manage biodiversity of the different breeds. Studies are progressively implemented in these different fields by research institutions in collaboration with professionals of the equid commodity chain, at the request and/or with the economic support of regions. In France for example, in the research institution of the region of Normandy (North-West), National Studs, professionals and regional authorities have carried out a long-term study on the production and use of young horses devoted to sports and races in a grassland area. Such an organisation is supported by fundings supplied by the region of Normandy, the French State through research institutions and National Studs and European Interreg network. In France, efforts have been made towards the identification of equid farming systems and the evaluation of the place of horses in farming systems (Moulin, 1995). Such efforts should be supported, in order to be extended to different zones, and co-ordinated, in order to determine more accurately the socio-economic contribution of equids in the different farming and/or use systems at farm and region level, using the same methodology used by researchers in Livestock Farming Systems (Gibon *et al.*, 1996; Keating & McCown, 2001). States and regions need indicators to elaborate a policy for equids in the scope of a global management of sustainable agriculture and peri-urban zones. The identification of equids and breeds should be promoted for genetic and economic purposes. A few small breeds are very well adapted to farming systems and/or use; but they are a small, endangered population. The new tools of molecular biology should be applied to preserve such a patrimony. For example, such an attempt has been very successful for the Lippizan breed with the support of EAAP and the European Community (Curik *et al.*, 2001; Dovc *et al.*, 2001; Kavar *et al.*, 2001; Marti *et al.*, 2001; Szbara *et al.*, 2001; Achmann *et al.*, 2002). Extended identification should be implemented using modern tools, such as microchips, in order to evaluate more accurately the importance of equid populations, as has already been done for

other farm animals. An attempt towards a Unique Equine Life Number (UELN) for sports horses is in progress in the European Union thanks to the good co-ordination between EAAP (Horse commission: Interstallion working group) and WBFSH (World Breeding Federation of Sports Horses); this effort is based on the combination of the methodologies and tools implemented in various countries for breeding evaluation. All these efforts to point out the importance of the equid commodity chain require a good co-ordination between the European countries, and the support of the EU Commission through the relevant pluriannual programmes. At present there is no possibility for funding these efforts by the EU in the context of the Framework Programme for R&D (6th FP). EAAP, with the contribution of the Horse Commission, could negotiate with the European Commission in order to elaborate actions in the context of the development of the 7th FP.

Conclusions

It is clear that equids are currently playing an increasing role in the new context of sustainable development, contrary to other animal productions. Until recently, the major constraints regarding their development have only been of psychological nature: should horses be considered as an agricultural product and/or a leisure animal? It is obvious that they should be considered as both. This diversity of activities and multi-purpose uses represents now a strong advantage in the context of the new deal for territory management. In recent years, the concept that once limited agricultural production only to food production is outmoded in Europe. This is particularly obvious in horse production that has now to be considered as a full agricultural product as of right.

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Livestock farming systems

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