PROCEEDINGS OF THE INTERNATIONAL COLLOQUIUM

Quality Agriculture: Historical Heritage and Environmental Resources for the Integrated Development of Territories

Editors
CHRISTOPHER R. BRYANT - MARIA GEMMA GRILLOTTI DI GIACOMO

BRIGATI - Genova - Italy 2007


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BUFFALO BREEDING IN THE VOLTURNO PLAINS: BETWEEN IDENTIFYING PERSEVERANCE AND PROSPECTS FOR DEVELOPMENT (CAMPANIA)

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In the Campania regional system, the dichotomy which characterizes the argillaceous-calcareous system and the alluvial-pyroclastic plains once again comes to the forefront not only in terms of breeding but also in zoo-technical aspects as well; goat and cattle breeding on the Apennine and pre-Apennine ridges contrasts with the sedentary context of buffalo breeding which still today characterizes the landscape of this territory. In order to identify the peculiarities related to buffalo breeding in the Volturno Plain and to understand the role played by the former in the new structuring of the territorial layout, this phenomenon must be considered within a wider perspective. While an analysis of environmental scenarios cannot be excluded, the priority is to tie the qualitative and quantitative evolution of this type of breeding to the agrarian, structural and organizational transformations which have affected the depressed areas of central and southern Italy.

The intensification of breeding induced by land drainage and agrarian re-structuring transformed the original physiographic and hydro-geological profiles as did changes in the methods, practices and role of buffalo breeding in the economic fabric of the plains. At present, the concentration of the buffalo herds in stalled breeding farms does not sufficiently al-

low for interpretation of the incidence of buffalo resources in the structuring of a landscape which was formerly characterized by the presence of swamps and the diffusion of malaria. Prior to reclamation, buffalo breeding in the wild was identified as the only possible use for unhealthy, swamp land; however, following the drainage work, there were many other potential uses. A diachronic analysis of ISTAT data reveals that the presence of buffalo in the maritime, Volterra plains, the Agro Pontino and Metapontino areas is progressively declining at the expense of more lucrative and competitive industrial cultivation based upon the relationship of direct proportionality between intensification of breeding and depletion of zoo-technical resources.

The greater incidence of buffalo breeding in defining the Volturno and Sele Plains was such that, although there was an initial sharp decrease and significant oscillations, breeding did not disappear altogether; the buffalo persevered in a more modern and innovative way and the consistency in the number of heads in the coastal area and bordering on water courses which regulate the surface hydrography demonstrate how strongly rooted this activity is in alluvial areas of the Campania regional system (RUOCCO, 1976). In addition to the similarities of the two plains from a geomorphological and structural point of view, cultivation sedimentation, the changes deriving from water regularization and canalization, the influence and levels of linkage with the adjacent territorial systems, the dynamics of breeding, the levels of settlement as well as the diverse soil quality, influenced not only breeding practices but the quality, processing methods and commercialization of dairy produce.

In the Sele Plain, stalled breeding is widespread: the sudden transformation of the plains thwarted a gradual process of adaptation of those forms and activities which had originally characterized the territory. Unlike the centralized and extended territory of the Volturno Plain, the fertility of the alluvial-pyroclastic soil and the proximity to urban Naples have always induced policies aimed at agrarian enhancement which allowed the area to metabolise these changes. Over time and with diversified methods, the influence on the environment brought about by anthropization has generated greater cohesion in the material and immaterial weave.

The perseverance of buffalo in the Volturno Plains cannot be merely reduced exclusively to economic motivations. Rather, it can be attributed to the solidity of a heritage of knowledge, techniques and ways of life that

are rooted in the value system of the local community and the presence of identifying forms which have always characterized the landscape of the plains and have sustained the continuity and growth of this type of breeding. In 1960, two thirds of the buffalo resources were in the Campania regional system yet, of 27,300 head of buffalo, nearly 20,000 were in the province of Caserta. However, it would be incorrect to identify the breeding area with that of the entire Campania Plain since the buffalo were concentrated in the area known as *Terra dei Mazzoni* deriving from the long, slim implement with an iron point used by mounted buffalo herdsmen to control the herd (FORMICA, 1961) (Figure 1). The perseverance of place names related to breeding effectively bears witness to the geographical and functional unity of vast areas strongly affected by agrarian reform and land drainage which contributed to a sharp decline in grazing land despite a substantial increase in the number of buffalo.

Breeding in the wild, once practiced on a large scale on the plain, has now disappeared. It was tied to the capacity of buffalo to gain nourishment from the spontaneous grass found in the more depressed areas which

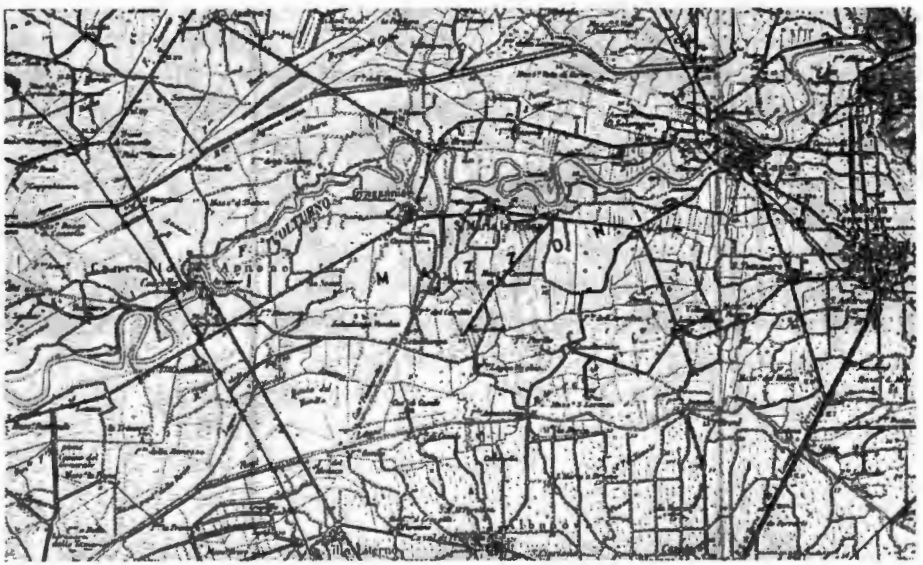

Fig. 1 - Terra dei Mazzoni: Territorial Organization between Land Drainage, Agrarian Reform and Settlements.

would not have been digestible for any other type of cattle. This method of breeding and the very characteristics of buffalo are such that only a small number of personnel are required thus reducing the possibility of contracting malaria which had constituted a problem in the swampy, areas behind the dunes (DE MAGISTRIS, 1930). While the drainage works promoted the introduction and diffusion of vegetable, fruit and tobacco cultivation, the agrarian reform broke the dominion of large landed estates and the extensive use of large sections of the Lower Volturno.

The altimetric distribution of the population in the Volturno Plain is indicative of the transformations ensuing from agrarian reform and land drainage; prior to the drainage works, settlements were prevalently centred to the south of the Regi Lagni or near volcanic, calcareous structures, precisely where the alluvial deposits of the Volturno River were mixed with material of a pyroclastic nature. The agrarian landscape reflected this dichotomy which, on a local level distinguished the higher sections of the plain from those near the mouth of the river: in relation to the centres, the mosaic of cultivation and breeding systems implied an agrarian structure based upon small property holdings, whereas in the Lower Volturno area, the extensive spaces used for cultivation and breeding in the wild were clearly a legacy from the large landed estate system (RUOCCO, 1970).

Once the lands were drained, "defences" were partially expropriated, divided into lots and assigned to new owners with the aim of incrementing agriculture and enhancing productivity levels; nonetheless, the size of the farms which still exist in various areas of the plain reveal, as in the Lower Volturno, and the implementation of agrarian parcelling of exogenous origin gave way to local processes of functional merging such as the integration between buffalo breeding and cultivation of forage.

An analysis of the settlements characterizing the drained areas allows us to better understand the evolution of the landscape in relation to the prevailing economic activities. The farms located adjacent to the marshlands favoured a house and courtyard layout which was adapted to the needs of buffalo breeding on extended expanses of marsh and swamp lands; large farmyards bordered by living quarters and perimeter walls. These walls and un-plastered, brick columns sustain a high roof to provide shelter for livestock (PEDRESCHI, 1964).

In other areas of the plains, the dwellings have smaller-sized courtyards, related to the harvesting of agricultural produce, with a portico and arches beneath which the various phases of processing are conducted as

well as space on the ground floor for the storing produce and tools. In the Lower Volturno, this type of recursive structure is characteristic of all the centres in the plains, and is re-adapted to the needs of breeding. With its structural and dimensional characteristics, the rural dwelling, which is the mainstay of territorial organization, re-proposes the methods of use and valorization of endogenous resources as well as the community's culture and value system.

The *pagliare* (straw hut structures) were generally found in the more depressed areas where there was a courtyard for the buffalo and two small areas which were used to store hay and provide shelter for the buffalo herdsmen. The simplicity of the structures and the absence of areas for processing milk bear witness to the unhealthy and precarious conditions of the environment in the area of the plains behind the dunes. In addition to the rectangular shaped-straw hut structures, which were most affected by the drainage works aimed at change and functional re-conversion, there are also circular huts which were also quite common in the Sele Plains. Following the disappearance of breeding in the wild, the state of deterioration of these structures raises doubts as to their functionality; in relation to the location, on a complementary level and as related to other rural structures, they could assume the role of simple shelters for buffalo or units for the processing of milk and dairy products. In the latter case, greater attention is required in selecting the materials and the specifications for the roof, the entrance door and the openings in the perimeter walls, and the internal layout is complex. Rural structures used for breeding buffalo in the wild contrast, in terms of organization and localization, with those built by the O.N.C. (*Opera Nazionale Combattenti* - National Veterans Works) which were constructed with the aim of intensifying cultivation and enhancing the productivity levels of the fertile, alluvial soil. The new dwellings are distributed along the reclamation roads which run parallel to, or at right angles to, the old roadways. The diverse types of dwellings provided for and built in the area in relation to the size and characteristics of the farms do not have large enclosures or courtyards for buffalo breeding. The altered agrarian conditions and the small size of the parcels allocated to each family were functional to the intensification of cultivation which contrasts sharply with the practice and the needs related to breeding in the wild. The stalls and barn were so small in size that an analysis of the renovations of the ONC dwellings revealed that the barns were the structures that underwent the most radical work. The increment in buffalo

breeding in relation to renewed competitiveness and the value added aspect of dairy products had brought about new extensions to these "functional cells" and, in some cases, large roofing was added on to the side of the dwelling for the raising of a few buffalo.

In order to allow cultivation of the drained areas, a semi-stalled form of breeding prevails in the Lower Volturno area, north of the Regi Lagni (Terra dei Mazzoni) and along the canals, whereas the Agro Aversano, that section of the plain most involved by periurbanization and the construction of infrastructure owing to the pressures exerted by the proximity of Naples and to its nodal position on a regional level, breeding is essentially stabled. The buffalo stalls are modern structures created using local materials which provide ample sections for the conservation of cheese and the equipment for supplying water to artificially reconstruct the original characteristics of the environmental scenario (Figures 2 and 3).

In contrast to what has been observed in the other drained areas in central and southern Italy, along the Lower Volturno plain, the rate of livestock increase is directly proportional to the increase in levels of agricultural intensification. Despite the fact that, in flat areas, the expanse of spontaneous grassland has sharply declined to the point that it only exists along the canals, the greatest integration of zoo-technical with other sec-

Fig. 2 - Buffalo Breeding Farm.

Fig. 3 - Buffalo Milk Processing in the Volturno Plain.

tors of the primary, secondary and tertiary sectors have revitalized, on a competitive and innovative basis, an activity deeply rooted in the local context.

In 1908, prior to the land drainage, census data revealed that there were 5,900 head of buffalo in Caserta province, whereas during the 1960s there were approximately 20,000. This positive trend consolidated during the following decades until reaching a figure of 71,150 head of buffalo in 1991 and 94,278 in 2001. The data are all the more significant if one considers that buffalo resources in Caserta Province, and thus in the Volturno Plain, constitute 82% of this resource on a national scale. Similar levels of territorial concentration can clearly be noted in analyzing the distribution of the buffalo farms; of the 1,290 listed members of the National Association of Buffalo Breeders, 980 or 76% are located in the province of Caserta. The complexity of the buffalo sector can also be inferred by the influence it has in defining the cultivation profiles of the agrarian landscape. In the Lower Volturno plain, rotation cultivation of forage crops is so prevalent that, based upon the Fifth Agricultural Census (2001), in the town of Castel Volturno, there are 219 agricultural en-

terprises covering a total surface area of 1,714 hectares. Thus, it is not by chance that once again in 2001, within the province, the town of Castel Volturno had the highest concentration of enterprises engaged in buffalo breeding (14%) and the greatest number of head of buffalo belonging to the race indicated by the ANASB as *Mediterranea Italiana* (15%) following the town of Cancello ed Arnone where 24.3% of the enterprises and 25.2% of the head of buffalo are located. A territorial study, based upon the diachronic analysis of Land Designation Charters (*Carte dell'uso del suolo*) and ISTAT data, has revealed the close relationship which, pursuant to the land drainage program, has bound agriculture and breeding in the territory. Indeed, in areas located near the stalls, ample portions of the plain are engaged in the cultivation of forage crops, the nutritional properties of which are closely associated with the qualitative characteristics of the soil (DE GENNARO, 2002). Notwithstanding the changes which have occurred in breeding forms and methods, *in loco* production of forage provides the buffalo milk with the special characteristics and thus ensure the uniqueness of the dairy products. The production of dairy products, which has always constituted a special activity on the plain, is tied to the presence of buffalo, and is reacquiring centrality and strength. By virtue of its peculiarity, it is experiencing an expanding market share which is increasingly extending beyond regional limits. The vibrancy of the market sector tied to buffalo milk processing is substantiated by the increase in sectoral employment and production units. During the census interval between 1991 and2001, there was a marked increase of 104% in the buffalo population as compared to a slight variation in the number of farms (7.9%), which indicates that those methods used in running the farms and merger methods are capable of ensuring greater territorial expansion for the farms and consequently an incisive and competitive increase in the potential of zoo-technical resources. The strong relationship between the environmental scenario and buffalo breeding is confirmed by the data regarding farm localization in relation to altimetric areas. As of 2001, 703 farms out of 899, for a total of 79,5% of the province's buffalo resources, are in the Volturno Plain (Figure 4).

All of the farms are engaged in the production of "buffalo mozzarella"; it should be noted that the denomination "mozzarella" is erroneously extended to other types of fresh cheese obtained from cow milk, whereas the term mozzarella means fresh cheese made from buffalo milk originating from the areas of Agro Pontino, the Volturno and Sele Plains, i.e. from

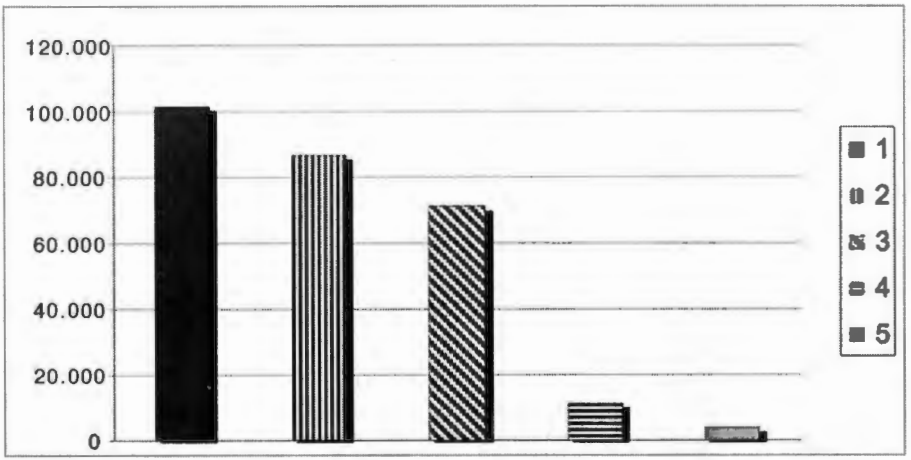

Fig. 4 - Buffalo Resources in Italy: Quantity and Distribution. Legend: Number of head of buffalo in: 1) Italy; 2) Campania; 3) The Province of Caserta; 4) The Province of Salerno; 5) Other Campania provinces - Source of data: Campania Region 2001.

those areas where the presence of buffalo belonging to the Mediterranean race has been historically ascertained. Recognition of DOP (*Denominazione di Origine Protetta* – Denomination of Protected Origin) status – as accorded in a Ministerial Decree of 1993, and registered according to EEC Regulations of Geographical Indications and Denomination of Origin in 1996 – has contributed to sustaining a rapid increase on a provincial level of farms engaged in the dairy sector not only in the Volturno Plains but in the Matese area as well. In this area, however, there is a prevalence of cattle breeding. Based upon ISTAT data, during the census intervals of 1981/1991 and 1991/2001, increases of 27% and 23.6% were respectively recorded with a related increase in employment passing from 831 workers in 1981 to 883 in 1991 and 1097 in 2001. While there was a positive evolution in forms of management and methods of farm mergers, 52% of the farms engaged in the production of dairy products qualified as cottage industries. This factor justifies the use, albeit in an innovative way, of processes rooted in the local culture. In 2003, the production of DOP buffalo mozzarella recorded a 6% increase over the figures for 2002 while the quota of export sales increased to 16% of the quantity produced as opposed to 14% in the previous year (Figure 5).

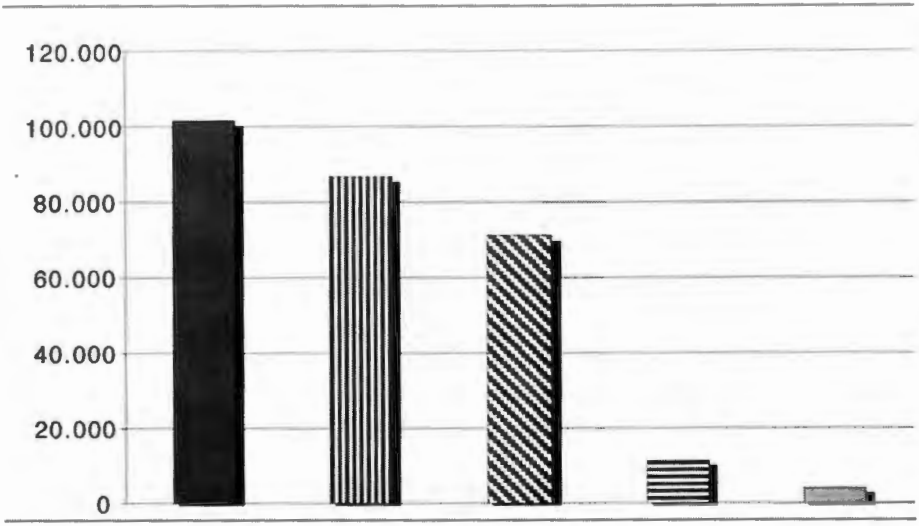

Fig. 5 - Buffalo Breeding Farms in Italy. Legend: Number of buffalo breeding farms in: 1) Italy; 2) The Province of Caserta; 3) The Province of Salerno; 4) Other provinces of Italy - Source of data: Campania Region 2001.

The progressive territorial concentration of buffalo is in contrast to the significant diffusion of local units engaged in the processing of buffalo milk. Prior to land drainage, buffalo milk from the Lower Volturno area converged towards the centre of Aversa, whereas currently, the structures dedicated to processing and commercialization now tend to be located along the coastal areas, in correspondence with the roadways which, on a local level, separate the coastal areas dedicated to tourism from the internal areas, and on an inter-regional level, serve to link significant centres of the Tyrrhenian system. A diversification process of activities is taking place in the Lower Volturno, which, only in appearance, deviates from the mono-functional profile associated with the exclusive presence of buffalo breeding in the wild throughout the territory. The *leit motiv* of this functional diversification can be attributed to the buffalo, this staunch figure of the plains, and contributes to sustaining the local economic fabric by directly involving the primary sector (buffalo breeding farms) and indirectly involves forage cultivators, the secondary sector (dairy farms) and the tertiary sector (wholesale and retail distribution of dairy products).

Integration of the diverse and convergent contexts maintains productivity levels of the Lower Volturno and agrarian interests high. The cultivation and organizational aspects of this sector have experienced a period of intense change tied to the modern, competitive use of areas which were once unhealthy. From this perspective, buffalo breeding is of particular geographic interest because it constitutes a legacy, the continuity of original territorial characteristics and finds fundamental support in diachronic, evolutionary studies of the local area. The integrated valorization of the straw hut structures as well as those associated with breeding in the wild could reinforce the significance of identifying signs which are progressively losing connotation and value as a result of the strong environmental and landscape pressures exerted on the territorial system.

Although breeding forms and methods have changed in relation to the progressive transformation of the environmental scenario, the buffalo sector is still characterized by strong ties with its area of origin, yet has managed to insert itself, in a competitive manner, into the dynamics of global *marketing*. From this perspective, large scale promotion of local products requires attentive reflection as to the role of identity in the endogenous pursuit of long-term, eco-compatible development.

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