

Salt and pastoralism in ancient Veneto

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INTRODUCTION

It is well known that salt had many uses in ancient times: it was used in the preservation of perishable foodstuffs (meat and fish), to add flavour to food, but also as a food supplement in animal husbandry, particularly for ruminants. A sheep needs to consume approx. 4-5 kilograms of salt per year: for an average flock of 500 animals, a minimum of 500 quintals per year is therefore required (Bonetto 1997, p. 138). In this contribution we will focus on the need for salt for livestock farming and concentrate on an area stretching between the current provinces of Verona, Vicenza and Padova, which between Protohistory and the Roman age found in livestock farming one of its fundamental resources.

The research is linked to the broader project *In Veronensium mensa. Food and wine in ancient Verona*, conducted by the Department of Culture and Civilisation of the University of Verona as a project of scientific excellence funded by Cariverona¹. With an extremely innovative and interdisciplinary methodological approach that has involved the collection of literary, epigraphic, archaeological and archival sources, as well as archaeobotanical and archaeozoological, isotopic and chemical analyses of vase residues and grape-seed DNA, the research aimed to highlight the historical roots of food and wine production and consumption in a city that is still today a lively agri-food market, particularly famous throughout the world for the quality of its wines. The aims were to capture, on the one hand, continuities and therefore traditions, and on the other hand, innovations in the diets of the inhabitants over the centuries and in particular in the pre-Roman, Romanisation, end of the Empire and establishment of the Middle Ages, which marked decisive economic, social and cultural transitions in the history of the urban centre and its territory.

This contribution will present some reflections on the topic of salt in relation to livestock farming, through the collection of data emerging from a study still in progress about the topic, bearing in mind that archaeology of pastoralism and archaeology of salt share research methods based on direct and indirect indicators: geomorphological and environmental characters, sedimentology and soil micromorphology, archaeozoology, ethnography, ethnohistory, literary sources, toponymic data and material culture.

PASTORAL MOVEMENTS IN THE VENETO REGION

The studies about archaeology of pastoralism in the Veneto region date back to the '80s of the last century, when the phenomenon was studied in the western Veneto during the Bronze and Iron

¹ Launched in 2020 and now coming to an end, the project saw the collaboration of the department of Biotechnology of the University of Verona, the Superintendence of Archaeology, Fine Arts and Landscape of Verona, Rovigo and Vicenza, the city's Academy of Agriculture, Science and Letters, the city's Museum of Natural History and the Museum of Legnago.

ages. The archaeological reconstruction was preceded by careful geographic, ethnographic and historical studies (Migliavacca 1985; 1989; Bonetto 1997).

The geographic study showed that the geomorphology of the region is particularly various and apt to pastoral activities, changing from the wetlands of the Po plain to the drier extents of flat grounds north to the water springs line, up to the subalpine hill zone and finally to the highlands of the Prealps, achieving 2000 m above sea level. To these different geomorphological units correspond different grass grounds, the most productive being *Trisetetum*, from 800 to 1400 m above sea level, and the swampy lowlands.

The ethnographic study helped in recognizing different forms of pastoral activities, ranging from the sedentary shepherds to the mobile ones: in western Veneto the pastoral movements take place between the winter pastures in the lowlands or in the bottom of the valleys, and the summer grazing areas in the mountains, as it usually happens in the Mediterranean basin. As for the low Po plain wetlands, they have been exploited by different groups of shepherds coming not only from the Lessini and Belluno mountains in the Veneto region, but also from the Apennines south of the river Po (Migliavacca 1989; 2001).

Historical data showed that all the vegetation belts were being exploited, according to different historical conditions, by a series of different pastoral movements since 9th century a.D. continuously until the present. They variously combined the resources offered by the environment, exploiting five different grazing areas, the wetland of the low Po plain, the drier pastures of the high Po plain, the *Brometum* of the hill zone, the *Trisetetum* of the prealpine zone up to the summer *Seslerieto-Semperviretum* of the calcareous highlands. Among the summer pastures of the highlands and the winter pastures in the lowlands, intermediate grazing (variously named as *stavoli*, *masi*, *tede*) areas were exploited. Tight links especially and continuously connected through time the water spring winter grassland in the Verona and Mantua lowlands with the summer pastures in the highlands of Monte Baldo and Lessini; and the Padua lowlands together with the Vicenza high Po plain with the Asiago plateau high pastures.

The archaeological study considered not only archaeozoological and palaeoenvironmental data, artefacts connected with milk and wool working and with wood and meadows management, but also data related to the geomorphology, to the water sources, to the buildings present in the site in order to gain information about its possible seasonality.

In a second time, the difficulty in detecting sure traces of past pastoral activities led to the application of *studies of soil chemistry* to possible pastoral sites. A recent study demonstrates that soil chemistry can help in detecting a Bronze age embankment road devoted to the passage of herd, localized among three great *terremare* (Fondo Paviani, Castello del Tartaro and Fabbrica dei Soci) in the Po lowland (Migliavacca, Pizzeghello, Nardi 2012; 2021).

SALT AND PASTORALISM IN VENETO

Ethnographic sources demonstrate the importance of salt for reared animals in the Veneto low Po plain. "Salted areas" in the Valli Grandi Veronesi -Po lowlands are indicated as apt to animals by the 20th century shepherds. When interviewed, the shepherds from Torretta di Legnago, in the Valli Grandi Veronesi located between the Adige river to the North and the Po river to the South, explained that the animals -sheep and goats- were driven to the best pastures, called "terre

salate” in the winter. As a matter of fact in the Veneto region the presence of salinity is higher in soils with a high content of organic matter, especially in the southern Po plain where the Adige and Po marsh areas have been reclaimed (ARPAV 2020).

In addition to this, numerous place names demonstrate the extraction and trade of salt in Veneto in historical times, from the current coast line (Le Saline at Chioggia-VE) through the plain (Saline – Rovigo and Saline -Due Carrare, PD: we must remember that the ancient coast line was backward compared to the current one) to reach the inner Veneto (Saline- Vicenza; Saline – VR; Saline - Negrar, VR) and Lake Garda (Saline di Lazise; Salò).

Historical data show that specific laws were conceived to ensure the supply of salt to animals reared in the Veneto mountains, that are poor of this resource: during 12-13th centuries, people living in the Lessini have not to pay salt duty, but they must obtain controlled supplies from Verona (Cangrande della Scala 1326: Cipolla 1882, pp.61-63). The Republic of Venice confirmed these salt privileges (deliberation of the College in Venice, 1406: Cipolla 1882, p.112). In 1509, mountain people can obtain salt supplies from Vicenza, Padova, Treviso, wherever they like, without the obligation to record the number of animals reared (Caldogno p.79; Cipolla 1882, p.143). The salt very probably came from the coastal lagoons.

SALT AND PASTORALISM IN VENETO DURING THE BRONZE AGE

It is possible to suppose a significant development of ovine rearing in the Middle-Final Bronze ages, when a demographic boom took place. The lowlands were exploited during the Middle-Final Bronze ages by the inhabitants of many embankment sites with the control of water drainage. This landscape organisation probably led to the reduction of the wasteland surrounding the site, hence to a shortage of available pastures for animals within walking distance of the site.

Micromorphological analyses and zooarchaeological studies hint at the relevance of animal husbandry in the economy of these embankment sites, where sheep and goats, but also cattle, pigs, donkeys, and horses were present.

The Veneto highlands were exploited throughout this timespan. A systematic field survey undertaken in the Lessini highlands identified 600 pastoral structures of uncertain chronology (breeders’ houses, shelters and sheepfolds), as well as a number of bronze axeheads, daggers, knives and spearheads, mostly dating to the Middle and Late Bronze Ages (BM and BR).

Permanent settlements are also documented in the highlands at lower altitudes: Monte Loffa, Guaite and Folesani (all BM), and Monte Croce (BR). Some of these sites were undoubtedly involved in seasonal sheep movements and can be interpreted as seasonal stopping stations. Parts of the aforementioned sites (so- called *castellieri*) were fortified with drystone walls, sometimes incorporating megalithic elements-

The presence of pastoral movements connecting the Po plain with the surrounding hills and mountains during the Middle and Late Bronze Age (BM to BR) is also suggested by the diffusion of the so- called *appenninico* styles. *Appenninico* pottery is rarely documented north of the Po River, but interestingly has been found at Fondo Paviani, in the low Veneto plain, and at Castellon del Brosimo and Monte Madarosa, in the Pre-Alps. This evidence suggests possible pastoral movements connecting the low Po plain with the Veneto Pre- Alps, and the meeting and blending of different material cultures in the Po lowland. Shepherds coming from the Apennines (south)

and from the Pre- Alps and Alps (north) could have exploited the wasteland surrounding the site as common winter pasture, as is widely documented for the same area in historical times.

If the invention of salt marches should be placed to the Roman period (Weller 2015), it is well known that other methods of salt extraction were used in prehistory: along the coast of northern Italy, traces of briquetage have been unearthed at Castelliere di Elleri, less than 1 km from the coast of the bay of Muggia (Montagnari Kokelj 2007). The *castelliere* dates from the middle Bronze Age to the Late Iron Age, and a system of sites (among which Stramare was probably the landing place of Elleri) indicates the importance of the area gravitating towards the bay of Muggia in salt production. A connection in material culture, especially for the large coarse ceramic containers, was found between the Friuli area and the Veneto plain open to the Adriatic sea (Cupitò, Leonardi 2015, p.219). It is reasonable that sea salt was produced also along the Venetian coast rich in lagoons, from which it reached the market centres. The site of Caorle San Gaetano, located near the Venetian lagoon and dating to Recent Bronze Age, is located near the Venetian lagoon; it features fire installations, wooden structures and truncated pyramid pillars, and has been interpreted as a possible salt production site (Bianchin Citton 2007; Cupitò, Leonardi 2015).

In the BR, two polities developed in the Veneto low Po plain, the settlements of Bovolone and especially Fondo Paviani. They controlled the circulation of copper coming from the Alps (and possibly from the Apennines) and amber from the Baltic, and wove relationships with the Adriatic and Aegean world, as confirmed by the presence of luxury pottery, glass and ivory artefacts. We can assume that the pastoral movements had their importance in this network, as agents of carriage and trade from the plain towards the highlands, both in the Alps and in the Apennines, and vice versa. So, it is not difficult to imagine that also salt was a key product in this trade network, arriving both from the salt lagoons of the Venetian coast and from the trade paths northwards through the Alps. The Hallstatt rock salt mines were already used during the Bronze age (dendrochronology dates extraction in some areas 1458-1243 BC, Harding 2013, p.62) and rock salt was very probably flowing southward to the Venetian plain, together with Alpine copper; for the last, this is shown by the lead isotope analysis (Artioli et al., 2020) and archaeological evidence (Cupitò et alii, 2015).

We know that the copper flow from the southern Alps intensifies again in the Late Bronze age (approximately from the half of the 12th century BC to the 10th century BC) as proved by the isotopic analyses of the metals found in the important trade centre of Frattesina in the low Po plain, and suggested by the distribution of slags often connected with elements of the Luco culture (Cierny, 2008; Leonardi, 2010; Cupitò and Leonardi, 2015); the close connection between north-eastern Italy and the Balkans is proved also by the distribution of pick ingots, socketed shovels and Ponte San Giovanni axes, which are considered as markers of metal exchange flows (Leonardi et al., 2015). The distribution of socketed shovels with short shoulders marks an east-west route from Hungary to east Lombardy, while the distribution of socketed shovels with large shoulders, pick ingots and Ponte S. Giovanni axes shows a connection between eastern Alps and the important trade centre of Frattesina in the Po plain, and thence Etruria. The distribution of Ponte S. Giovanni axes also shows the existence of a complex pattern of trade routes from Austria to peninsular Italy. Again, it is not difficult to imagine salt as a key product in this complex trade network.

SALT AND PASTORALISM IN VENETO DURING THE IRON AGE

During the Iron age, there was an enormous increase of salt production in Central and Western Europe (Harding 2015): an extensive network of salterns is reconstructed along the Mediterranean coasts, and the salt mines at Hallstatt achieved their greatest development in the early Iron age, while the salt mines at Durrnberg were exploited from the fifth century BC onwards. The two mining areas together must have produced enormous quantities of rock salt, which was no doubt moved far and wide, north and south of the Alps.

In Veneto, during the 8th-7th centuries B.C. the western mountain and hill zones are heavily abandoned, while in the plain the newly born Venetic cities developed a complex economy, in which stock raising, practiced in the high plain, had an important place also in connection with handicraft development. This is demonstrated for example by the findings in the sanctuary of the goddess Reitia at Este (7th century BC – 2nd century AD), where many votive offerings are connected with yarn and textile production (Gambacurta 2017). Although these cities were surely inserted in traffic with the areas north to the Alps, they were closely connected with the coast by the network of navigable rivers: the Adige for Este, the Brenta for Padua, the Bacchiglione for Vicetia, the Sile for Treviso and for Altino, that was linked to the sea also by the lagoon, in a territory rich with hints of salt production since the first century BC. So we can suppose that their salt supply came mostly from the sea.

From the end of the VI century B.C. important settlements developed in the mountains. It is worth underlying the presence of fortified sites at the limit of permanent settlements: they seemed to be interested in the exploitation of the resources of the highlands, among which pastures. The available data suggest that some of them were permanently inhabited by Raeti with a mostly pastoral economy, others were probably seasonally exploited by pastoral groups coming from the Venetic cities. The Raetic settlements had to be involved in the network of exchanges through the Alps, so receiving their salt supply (of which Veneto mountains are poor, as demonstrated by historical data) by the important mining areas in Central Europe.

SALT AND PASTORALISM IN VENETO IN ROMAN TIMES

Pliny (*nat. hist.* 31, 88) emphasises that civilised life was not possible without salt, showing the important role played by this commodity in daily life in the 1st century AD. At that time and in the following centuries, numerous salt production plants were active, such as the well-known ones located at the mouth of the Tiber near today's Fiumicino (the *Campus Salinarum Romanarum*) or those recently identified near Cervia (Morelli, Forte 2014, Guarnieri 2019). At both sites, archaeological excavations have uncovered the evaporation ponds and sections of the channels that brought seawater to the drying ponds to extract salt. No such salt pans have yet been clearly identified in the Veneto area, but various clues allow one to speculate on their existence.

A famous late antique literary source, Cassiodorus (var. 12, 24, 6-7), attests to the fact that the inhabitants of the coastal areas of Veneto exploited the fundamental natural resource of salt, which was even compared to gold. Recent research by the University of Venice in the northern part of the Venetian lagoon, and in particular at Lio Piccolo, Scanello, Costanziaco/Ammiana, and San Francesco del Deserto, is highlighting dwelling structures datable to a long chronological span

(1st - 7th century AD), which the almost total absence of stratigraphic excavations prevents a more precise delimitation (Calaon, Cipolato 2019; Cottica 2019). These were villas with productive parts related to the exploitation of an amphibious landscape, suspended between land and water, where fishing and hunting were practised, but also most probably the salt economy, as is confirmed for the following centuries by numerous archive documents (Hocquet 2003) and also by the presence in the area of places with the significant name of Saline. As Hocquet writes, it is probable that salt production 'had been earlier in the northern part of the lagoons, which retained a certain superiority over Chioggia and the southern sector until 1100, although the situation had already begun to reverse by the last quarter of the 11th century'. In addition to these inhabited settlements, a number of infrastructures known in the past as 'road embankments' have also recently been attributed to probable work activities, most of which have been highlighted by underwater archaeology. Consisting of a kind of formwork made of wooden poles and horizontal planks, filled with fillings such as building waste, mud and numerous fragmented amphorae, they are on average 2 m wide and vary in length. As D. Calaon observes, "their fragmentary and diffuse dislocation, their volume (rather modest) and the type of environmental context lead us to think that they are embankments aimed at closing, enlarging and delimiting specific stretches of water, eminently for productive reasons (fishponds, inland valleys and salt pans)", creating walkways on their summit, functional to these activities. Other wooden elements recovered from the underwater excavations were related to sluice gates that had to control the incoming and outgoing water, as was the case in both fish-breeding and salt-drying tanks (Calaon, Cipolato 2019, p 30 e fig. p. 38).

Another indication of salt production in the Venetian lagoon area comes from the development of sheep and goat breeding practices, which, as mentioned earlier, required ample supplies of salt. It is no coincidence that cities such as Altinum, located within the lagoons themselves, or Patavium, whose ager must have reached all the way to the sea, in the area of today's Saccisica, are known from literary and epigraphic sources as important centres of wool production (Bonetto 1997, p. 138; Basso, Bonetto, Ghiotto 2004). Padua, in particular, is mentioned by Strabo as the second richest city in the Empire thanks to the manufacture of gausapae, heavy fabrics used to make carpets or clothes for harsh climates or for soldiers' clothing, sent to the market in Rome (5.1.7). It was a herd that may have been sedentary, as attested by recent studies by the University of Padua at Ca' Tron, near Altino Busana, Cerato, Garavello 2011), but above all transhumant, so that the animals in the hot season grazed in the mountain areas rich in excellent fodder and in the cold season wintered on the plains (Bonetto 2004). Topographical evidence of great interest on transhumance comes from the herding roads that were recognised in Roman times in the province of Padua, directed to the Asiago plateau and the upper Vicenza area. Therefore, the territory analysed in this contribution, precisely because of its geographical position between the lagoon fringe and the mountainous areas, lent itself well to cattle breeding, as well as to the processing of the raw materials provided by the latter. If the pastures of the mountains offered the flocks an excellent summer diet, it was the coast that produced the salt that was an essential supplement to that diet.

Bibliography:

ARPAV 2020, *Carta della reazione (pH) e carta della salinità dei suoli della Regione Veneto*, Venezia.

Artioli, G., Canovaro, C., Nimis, P., Angelini, I. 2020, Lia of prehistoric metals in Central Mediterranean area: a review, in *Archaeometry*, <https://doi.org/10.1111/arcm.12542>

P. Basso, J. Bonetto, A. Ghiotto, Produzione, lavorazione e commercio della lana nella Venetia romana: le testimonianze letterarie, epigrafiche e archeologiche, in *Wool: products and markets (13th-20th century)*, ed. by G.L. Fontana, G. Gayot, Padova 2004, pp.49-78.

E. Bianchin Citton 2007, *Il sito di S. Gaetano di Caorle: un approdo adriatico della tarda età del Bronzo*, in Fozzati L. (a cura di), *Caorle archeologica*, Memorie mediterranee 3, Venezia.

J. Bonetto, *Le vie armentarie tra Patavium e la montagna*, Dosson (Treviso) 1997.

J. Bonetto, *Agricoltura e allevamento in Cisalpina. Alcuni spunti per una riflessione*, in *PECUS. Man and animal in antiquity*, Proceedings of the conference at the Swedish Institute (Rome, 9-12 September 2002), Rome 2004, pp. 57-66.

M.S. Busana, I. Cerato, S. Garavello, *Agricoltura e allevamento nell'agro orientale di Altinum: il caso di Ca' Tron*, in *Antenor* 2011, pp.

D. Calaon, A. Cipolato, *La laguna nord di Venezia in età romana e tardoantica*, in *Vivere d'acqua. Archeologie tra Lio Piccolo e Altino*, a cura di M. Bressan, D. Calaon, D. Cottica, Crocetta del Montello (Treviso) 2019, pp. 40-59.

F. Caldugno 1972, *Relazione delle Alpi vicentine e dei Passi e Popoli loro*, (1598), Verona.

C. Cipolla 1978, *Le popolazioni dei XIII Comuni veronesi*, (1882), Giazza.

D. Cottica, V. Goti Vola, *La villa romana di Lio Piccolo*, in *Vivere d'acqua. Archeologie tra Lio Piccolo e Altino*, a cura di M. Bressan, D. Calaon, D. Cottica, Crocetta del Montello (Treviso) 2019, pp. 27-39.

M. Cupitò, G. Leonardi 2015, *Il Veneto tra Bronzo antico e Bronzo recente*, in G. Leonardi, V. Tiné (a cura di), *Preistoria e Protostoria del Veneto*, Firenze 2015, pp.201-239.

Gambacurta 2017, A loom for the goddess - tools for spinning and weaving from the sanctuary of the goddess Reitia in Este (Padua), in *ORIGINI*, vol. 40, pp. 211-226

C. Guarnieri, *Le saline romane e il territorio di Cervia. Aspetti ambientali e infrastrutture storiche*, Bologna 2019.

A. Harding 2013, *Salt in Prehistoric Europe*, Leiden: Sidestone Press.

A. Harding 2021, *Salt. White Gold in Early Europe*, Cambridge: Cambridge University Press.

J.-C. Hocquet, *Le saline dei Veneziani e la crisi del tramonto del medioevo*, Roma 2003.

M. Migliavacca 1985, *Pastorizia e uso del territorio nel Vicentino e nel veronese nelle età del Bronzo e del Ferro*, in "Archeologia Veneta", VIII, pp.27-62

M. Migliavacca M. 1989, *Pastorizia e uso del territorio nell'età del Bronzo nel Veneto: linee di approccio al caso della bassa pianura veronese- altopolesana*, in Atti della Tavola Rotonda

Internazionale *Archeologia del Pastoralismo in Europa meridionale*, Chiavari 22-24 Settembre 1989, estratto dalla Rivista di Studi Liguri, A. LVI (1990), Istituto Internazionale di Studi Liguri, Bordighera 1991, pp. 315-328

M. Migliavacca 2001, *Per uno studio dello sfruttamento pastorale antico nelle Valli Grandi Veronesi: dall'archivio etno-antropologico alla ricaduta archeologica*, Atti del II Convegno Nazionale di Etnoarcheologia, Mondaino (Rimini) 7/8 giugno 2001, pp.179-186

Migliavacca M., Pizzeghello D., Busana M. S., Nardi S. 2012, *Soil chemical analysis supports the identification of ancient breeding structures: the case-study of Cà Tron (Venice, Italy)*, in "Quaternary International", p. 1-9

Migliavacca M., Pizzeghello D., Nardi S. 2021, *Una strada armentaria dell'età del Bronzo nelle Valli Grandi Veronesi: il contributo delle analisi chimiche dei suoli*, in "Padusa" LVI, Nuova Serie, pp.221-227

E. Montagnari Kokelj 2007, *Salt and the Trieste Karst (North-Eastern Italy) in prehistory: some considerations*, in *L'exploitation du sel à travers le temps*, Piatra-Neamt, pp.161-187.

C. Morelli e C. Forte, *Il Campus Salinarum Romanarum e l'epigrafe dei conductores*, in MEFRA 126.1, 2014 <https://doi.org/10.4000/mefra.2059>