EXPLORING THE CATTLE ECONOMY OF COLONIAL SOUTH CAROLINA

Martha A. Zierden, Carla S. Hadden, Sarah E. Platt, Barnet Pavao-Zuckerman, Laurie J. Reitsema, Elizabeth J. Reitz, Hayden R. Smith, and Grant Snitker

Martha A. Zierden is the curator of historical archaeology at the Charleston Museum. Carla S. Hadden is an assistant research scientist at the Center for Applied Isotope Studies, University of Georgia. Sarah E. Platt is an archaeological analyst for the Digital Archaeological Archive of Comparative Slavery (DAACS) and a PhD candidate at Syracuse University. Barnet Pavao-Zuckerman is an associate professor and associate chair at the Department of Anthropology, University of Maryland. Laurie J. Reitsema is an associate professor at the Department of Anthropology and director of the Bioarchaeology and Biochemistry Laboratory at the University of Georgia. Elizabeth J. Reitz is a professor emerita at the Georgia Museum of Natural History, University of Georgia. Hayden R. Smith is an adjunct professor in the Department of History, College of Charleston. Grant Snitker is a postdoctoral research associate in the Department of Crop and Soil Sciences at the University of Georgia.

An ongoing project supported by a recent National Science Foundation (NSF) grant seeks to examine the role of cattle in the commercial network of an emerging colonial city, focusing on Charleston, South Carolina, as a case study. The research team is exploring the emergence and evolution of this colonial urban center from the perspective of its animal economy. The goal is to clarify relationships between rural and urban societies and the impact of those relationships on early economies and environments. The project merges archival, material culture, stable isotope, and zooarchaeological studies of legacy materials from Charleston and its hinterlands to examine the seventeenth- to nineteenth-century cattle economy.

Large rice plantations and an enslaved labor majority defined the landscape and economy of the Carolina Lowcountry during the late 1700s, yet origins of this plantation enterprise are connected to an earlier cattle economy. Cattle and cowboys, mostly enslaved Africans, were two of the early landscape engineers. Shortly after European-sponsored colonization began, free-range cattle, timbering, and fires displaced Native Americans and degraded wetlands. Africans' experiences with this landscape, particularly the small-stream floodplains frequented by cattle, facilitated the emergence of large-scale production of rice for the global market (Figure 1).

Charleston is the symbolic center of the Carolina Lowcountry. The Lowcountry consists of a mosaic of tidal floodplains, coastal dunes, marshes, and islands extending about 60 km inland from the Atlantic to the upper limits of tidal flow in coastal streams. It has a mild, temperate climate with high annual rainfall. The Lowcountry is part of the Southeastern Coastal Plain, one of four isotopically and ecologically distinct ecoregions involved in the early cattle industry. The other three ecoregions are the Middle Atlantic Coastal Plain, the Sandhills, and the Piedmont.

Figure 1. Small-stream floodplain at Huger Creek, Berkeley County, South Carolina. Photograph courtesy of Hayden R. Smith.

A permanent British presence in the Lowcountry began after a proprietorship formed in 1663; the first colonists arrived in 1670. Soon thereafter, cattle were thriving in the Lowcountry's pinewoods, savannahs, canebrakes, and marshes (Salley 1911). Cattle were largely free-range, receiving little or no shelter or supplemental feed. Lowcountry cattle foraged on cordgrasses, salt grasses, and Spanish moss in upland pine communities, small-stream floodplains, and

hardwood bottomlands (Smith 2020:19). They were particularly fond of canebrakes, where they grazed year-round. In 1710, Thomas Nairne (1989:41) claimed that some settlers had 1,000 cattle and that herds of 200 head were common. Some early cattle centers, known as cowpens, were reported to have 6,000 or more animals (e.g., Dunbar 1961:128). Even if these numbers are exaggerated, they highlight the potential for overgrazing and other landscape changes.

Early cowpens were common between the Edisto and Savannah Rivers and in neighboring areas of North Carolina and Georgia. By the 1730s, cowpens might encompass 40–200 ha with clusters of corrals, outbuildings, living quarters, and gardens (Dunbar 1961). John Solomon Otto (1986, 1987) describes an annual cycle in which fields were burned in the winter to improve forage, beef cattle were rounded up for slaughter in the fall, and the meat salted. Live cattle, preserved meats, and tanned hides were sent from cowpens to Charleston and thence to other markets (Hart 2016; Otto 1987). Cattle ranching remained profitable even after rice became South Carolina's principal export, though the center of livestock production moved from the Lowcountry to the Middle Atlantic Coastal Plain and Sandhills (Owsley 1965). Both Europeans and Native Americans served as cattle hands, but the task of managing cowpens and driving cattle to market in Charleston largely fell to Africans (Otto 1987; Wood 1975:30–31). Of the 1,800 enslaved adult men in South Carolina in 1708, nearly a thousand were "cattle-hunters" (Edgar 1998:133). As the name suggests, early Lowcountry cattle could be semi-feral and challenging to manage.

The NSF project builds on over three decades of zooarchaeological analyses and other studies of the Charleston colonial economy (Reitsema et al. 2015; Zierden and Reitz 2016). Previous research on urban and rural Lowcountry sites reflects the importance of cattle in the Lowcountry (Figure 2). Beef was the dominant source of meat in Charleston assemblages. A modest decline in beef in the archaeological record after the mid-1700s probably is due to cattle diseases (Haygood 1986), an increase in commercial sources of meat such as butcher shops, and limited space for raising large animals within the city. High degrees of skeletal completeness on Charleston sites of all types suggest that many animals were raised near, or even within, the city and perhaps were butchered on urban properties. The young age at death suggests cattle were slaughtered for meat, with a few individuals kept into adulthood as milk cows and draft animals.

One aspect of the NSF project seeks to identify sources of cattle products using stable isotopes extracted from 93 cattle teeth recovered from 14 rural and 18 urban archaeological sites from the Carolina Lowcountry and adjacent ecoregions

Figure 2. Faunal remains in situ in Zone 10 (circa 1710) at the Beef Market site. Photograph courtesy of Martha A. Zierden.

(Figure 3). The earliest teeth are from rural settlements dating to the 1670s, and the latest are from an urban Charleston site occupied in the late 1800s. Stable isotopes in cattle teeth expand our understanding of Charleston and the Lowcountry because they reflect what cattle ate and drank, where they lived, and how they were managed. Isotopes are different variants of a chemical element. Most isotopes are unstable, and they decay or change after the animal dies. Stable isotopes do not decay, and they reflect the isotopic composition of their source material ingested during the lifetime of the animal. Oxygen (O) isotope ratios in cattle teeth reflect sources of drinking water. Carbon (C) and nitrogen (N) isotopes reflect the types of plants consumed, and by extension, foddering or free-range practices. Overgrazing, clearing forests, burning pastures, and draining wetlands influence carbon and nitrogen isotopes. Strontium (Sr) reflects the local bedrock, enabling us to distinguish between animals raised on the coastal plain and those raised in the Piedmont or outside of the Carolina colony. Sulfur (S) isotopes can distinguish between animals raised near the sea and those raised farther inland. Dietary reconstruction is facilitated by comparing isotopic analysis of the archaeological teeth with isotopic analysis of modern Lowcountry plants.

Variations among sources of cattle may show that this aspect of the animal economy began with local production within the city but moved into the hinterlands as the centuries unfolded. Similar isotopic ratios in teeth from rural and urban contexts would suggest cattle originated within or near Charleston, enabling us to consider direct or indirect procurement of cattle and cattle by-products from a relatively restricted area. Of more significance would be differences in stable isotopes suggesting that the animals did not originate near Charleston. In that case, the animal economy probably reached beyond the Lowcountry, perhaps into the Piedmont,

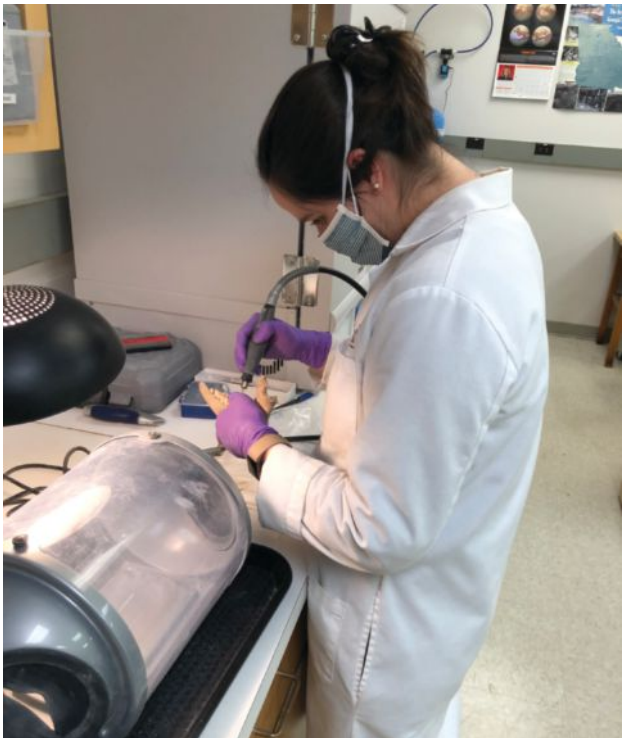

Figure 3. Graduate student Katie Reinberger sampling teeth in the CAIS laboratory. Photograph courtesy of Laurie J. Reitsema.

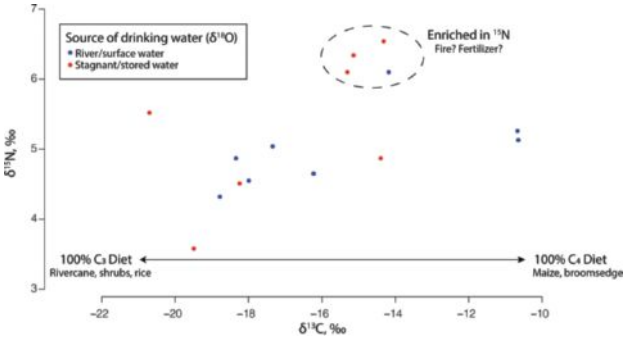

Figure 4. Data from pilot study.

into more distant locations, such as Creek towns, or even to trans-Atlantic sources, with broad implications for our understanding of this and other colonial economies.

A pilot study of 15 specimens provides tantalizing data. Isotopic variations in oxygen values may be evidence that animals were from several distinct, though unspecified, Lowcountry locations (Figure 4). Some animals drank surface water and others drank from highly evaporated sources, such as water troughs or stagnant ponds. Carbon and nitrogen isotope data also indicate that cattle were raised in several different locations using a variety of husbandry strategies. The carbon isotope data suggest that many cattle ate grasses that prefer warm, sunny growing conditions, known as C_4 grasses, perhaps cultivated maize or wild grasses such as broomsedge bluestem. Others consumed C_3 grasses that prefer growing conditions with high winter rainfall or cool growing seasons, such as rivercane. High nitrogen isotope ratios in four specimens provide additional evidence of diverse animal husbandry strategies. Variability in nitrogen isotope data may be evidence of landscape modifications, such as burning or micro-environmental variations. Some animals may have grazed in recently burned or plowed fields. Three teeth combine high nitrogen ratios with high carbon and oxygen ratios, suggesting these animals grazed within an enclosure, primarily ate C_4 grasses, and consumed trough or stagnant water. Strontium and sulfur data indicate that Charleston cattle originated in several different Lowcountry locations, though all of the teeth return strontium signatures consistent with a coastal plain origin. Some teeth have sulfur values typical of animals grazing in areas exposed to sea spray or consuming fodder harvested from seaside locations. Other animals may have grazed just outside of Charleston or may have been provided food and water from sources near or in the city. A few teeth have signatures suggesting they are from animals raised further from the coast. Expanding the isotopic study from the preliminary 15 teeth to nearly 100 will provide a more complex and complete picture of cattle's role in the development of the colonial economy.

These insights into the roles of cattle in an evolving colonial economy are augmented by data from other studies. Additional zooarchaeological analysis focuses on a rural trading post and cowpen (Mary Musgrove's Cowpen) and an urban residence/commercial venue where function changed through the colonial period (the Heyward-Washington property) (Figure 5). Soil cores from freshwater peat/marsh contexts will establish a vegetation and fire history for the region as cattle, fires, timbering, and rice cultivation altered the landscape and the economy. The project also relies heavily on new archival research into the environmental and technological history of the Lowcountry.

The project is an unprecedented opportunity to determine whether provisioning shifts occurred between the colony's foundation in 1670 and the evolution of Charleston into the important commercial center it became by the mid-1700s. It is clear that cattle contributed substantially to the colony's global trade network, beef was an important local food, young animals were slaughtered specifically for meat, and husbandry strategies were diverse. Cattle were abundant, required little

Figure 5. Eddie Stroman, Martha A. Zierden, Carla S. Hadden, and Grant Snitker (on the ladder) collecting a soil core in Hell Hole Swamp. Photograph courtesy of Robert T. Morgan, U.S. Forest Service.

capital or labor, and thrived in the Lowcountry. Through their labor as cow hunters, enslaved Africans became familiar with this diverse landscape, knowledge that was critical as wetlands were converted into rice fields (Navin 2020). This knowledge enabled rice cultivation to become a profitable plantation enterprise with lasting environmental and social consequences. This study of the early animal economy and associated landscape changes contributes to our broader study of provisioning shifts that led to Charleston's development as a major port with global connections.

It also is testament to the significance of legacy collections, a commitment to the long-term curation of environmental artifacts, and cooperation among colleagues. To accomplish our goal, we draw upon archaeological collections held by the Charleston Museum since the 1940s, in addition to collections loaned from many other public institutions, mitigation firms, and private collections. Many of the archaeological samples in this study were excavated decades ago, and some never have been studied. Still more discoveries lie buried beneath Charleston's streets and buildings, awaiting careful excavation and study in order to contribute to our understanding of emerging colonial economies and environments in North America and beyond.

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