

Vertebrate Use at Early Colonies on the Southeastern Coasts of Eastern North America

Elizabeth J. Reitz · Gregory A. Waselkov

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Abstract Data from early European-sponsored colonies on the coasts of the Atlantic and Gulf of Mexico in southeastern North America (USA) indicate that transformations in vertebrate use occurred quickly. Over half of the vertebrate individuals in a Spanish collection associated with the first permanent European settlement on the Atlantic coast (Florida), British collections associated with Charles Towne (South Carolina), and French collections from the northern coast of the Gulf of Mexico (Alabama and Mississippi) are local wild vertebrates. This use of wild vertebrates occurred regardless of a colony's national affiliation, the ethnicity of the colonists, or the century in which colonization occurred.

Keywords Wild and domestic animal use · Colonial foodways · Southeastern United States · Zooarchaeology

Introduction

Archaeologists have a long-standing interest in the processes and consequences of cultural contact (e.g., Becker 2013; Crass et al. 1998; Deagan 1973, 1998; Jordan 2009; Lightfoot et al. 2013; McEwan and Waselkov 2003; Majewski and Gaimster 2009; Rodríguez-Alegria 2005; Stein 2005; Wesson and Rees 2002). Much of this research focuses on historical events, social tensions, political interactions, and economic enterprises, often in terms of impacts on Native Americans. Although the biological phenomenon known as “The Columbian Exchange” (Crosby 1986) is widely recognized, the post-1492 evidence of that exchange in the Americas has received relatively

E. J. Reitz (✉)

Georgia Museum of Natural History, University of Georgia, Natural History Building, 101 Cedar Street,
Athens, GA 30602-7882, USA
e-mail: ereitz@uga.edu

G. A. Waselkov

Center for Archaeological Studies, University of South Alabama, 6052 USA Drive South, Mobile, AL
36688, USA
e-mail: gwaselkov@southalabama.edu

little attention, especially in terms of the consequences of colonization on colonists. Studies of plant and animal remains from post-Columbian colonial sites in the Americas show that responses by local Native Americans and colonists alike to colonial social, economic, and political forces were more strategic and varied than often presumed (e.g., Deagan and Reitz 1995; deFrance 1996, 1999, 2003; deFrance and Hanson 2008; Gifford-Gonzalez and Sunseri 2007; Gremillion 1993, 1995; Lapham 2005; Pavao-Zuckerman 2000, 2007; Pavao-Zuckerman and LaMotta 2007; Pavao-Zuckerman and Loren 2012; Pavao-Zuckerman and Reitz 2011; Reitz and McEwan 1995; Scott 2001, 2007, 2008; VanDerwarker et al. 2013), as they were at other times and places (e.g., Crabtree and Ryan 1991; DeCorse 1998; Mondini et al. 2004; Stein 1998; Twiss 2007). Instead of Native Americans, Europeans, and Africans abandoning or maintaining traditional patterns of animal use, these were merged into novel patterns. These mergers are particularly clear in vertebrate records from the three earliest European-sponsored colonies on the Atlantic and Gulf of Mexico coasts of North America (USA), which were founded between 1565 and 1702 (Fig. 1).

Drawing upon documentary accounts, the initial years of European-sponsored colonies often are characterized as periods of famine, starvation, and economic failure, instead of dynamic periods of experimentation and exchanges of indigenous and introduced plants and animals during which new patterns emerged. Although archaeological evidence cannot document that early colonial food-acquisition strategies in the Americas were sufficient to avoid famine among colonists (and they were not in some cases), it can document the flexibility of early colonists as they incorporated local resources into their lives. Whether they did so willingly, let alone eagerly, is another matter.

Zooarchaeological analyses have contributed substantially to studies of sixteenth-through nineteenth-century Native American, Spanish, British, French, and American uses of animals on these coasts. These studies support the generalization that colonial strategies combined indigenous wild animals with introduced domestic ones to produce new cultural forms unique to these coastal settings. These new cultural forms included transformations in the use of animals as food, as raw materials, and as commodities for trade. These transformations had profound influences in Spanish and British settlements on the southeastern Atlantic coast (Reitz 1994; Reitz and Cumbaa 1983; Reitz et al. 2010; Reitz and Scarry 1985; Zierden and Reitz 2009) as well as in Spanish and French settlements on the northern Gulf of Mexico (Gremillion 2002; Hardy 2011; Pavao-Zuckerman and Loren 2012; Reitz et al. 2014; Scott and Dawdy 2011). In each instance, the patterns of animal use that arose were permanent transformations, and indeed they persist in regional cuisines today.

The overall pattern of vertebrate use at these early colonies combined over a hundred different local wild vertebrates with a few introduced domestic ones. Many of the wild vertebrates in post-1565 assemblages from southeastern coastal sites are aquatic, including many different turtles and American alligators (*Alligator mississippiensis*). In most cases, the dominant wild resources in these assemblages are estuarine fishes, with sea catfishes (Ariidae), mullets (*Mugil* spp.), and drums (Sciaenidae) consistently prominent among them. White-tailed deer (*Odocoileus virginianus*) are the major wild, terrestrial mammals in these collections, accompanied by many other mammals, such as Virginia opossums (*Didelphis virginiana*), rabbits (*Sylvilagus* spp.), tree squirrels (*Sciurus* spp.), common raccoons (*Procyon lotor*), and black bears (*Ursus americanus*).



Fig. 1 Study area. Old Mobile is located 43 km north of Mobile Bay on the Mobile River, Dog River is located on the west side of Mobile Bay, and La Pointe-Krebs is ca. 30 km west of Mobile Bay on the Pascagoula River

Introduced domestic animals are primarily pigs (*Sus scrofa*), cattle (*Bos taurus*), and chickens (*Gallus gallus*), but include a limited number of cats (*Felis catus*), horses or donkeys (*Equus* spp.), goats (*Capra hircus*), sheep (*Ovis aries*), and common pigeons (*Columba livia*). With the exception of dogs (*Canis familiaris*), all of these domestic

animals were introduced, and some of the dogs may be introduced breeds instead of indigenous ones. Domestic muscovy ducks (*Cairina moschata*) are of South American origin. Their presence in a 1712–50 Charleston deposit underscores the broad synthetic reach of colonists, who merged resources from the Americas, Eurasia, and Africa to form these new economies.

This broad pattern is reflected in vertebrate collections from coastal Native American communities in Florida, Georgia, and Alabama; the Spanish towns of St. Augustine (Florida) and Santa Elena (South Carolina); Spanish missions in Florida and Georgia; British colonies in Florida, Georgia, and South Carolina; French colonial settlements on the Gulf coast; and rural American plantations in South Carolina and Georgia (e.g., Colaninno-Meeks and Reitz 2012; Orr and Colaninno 2008; Orr and Lucas 2007; Pavao-Zuckerman 2000; Reitz 1986, 1987, 1991, 1992, 1993, 1994; Reitz and Bergh 2012; Reitz and Cumbaa 1983; Reitz et al. 2014; Reitz et al. 1985; Reitz and Nicholas Honerkamp 1983; Reitz et al. 2010; Reitz and Scarry 1985; Zierden and Reitz 2009).

Of course, vertebrate use extends far beyond immediate food provision needs. Trade in deer hides, meat, and other commodities was extensive between Spanish, British, and French colonists and native hunters throughout the Southeast during our period of interest (e.g., Braund 1993; Lapham 2005; Waselkov 1989, 1992, 1998, 2004). Likewise, cattle herds flourished along the southeastern coasts, so much so that Creek hunters were concerned that cattle competed with deer and blamed cattle for an outbreak of disease among people in 1767 (Braund 1993, pp.75–76; Orr and Lucas 2007; Otto 1986, 1987; Stewart 1991).

Most traditional European modes of agriculture were unproductive in early Spanish, British, and French colonies on these southeastern coasts. During a brief period of invention and adjustment, early settlers in these multi-ethnic colonies modified traditional animal husbandry, economic, and dietary practices to include resources better suited to their coastal setting. That these habits, developed early in each colony, characterized each colony's use of vertebrates during subsequent decades is demonstrated in the following pages by concentrating on evidence from the two earliest Spanish and British settlements on the southeastern Atlantic coast and early French sites on the northern coast of the Gulf of Mexico.

Terminology

At the risk of oversimplifying complex social dynamics, each site is referred to in terms of its most prominent European claimant: Spain, Great Britain, or France (Deagan 1983; Waselkov 2009; Zierden 2000). The major players were the Spanish Empire, or entities that had been or were to become part of that empire (e.g., the Philippines, the Netherlands, Germany, northern Africa, New Spain, the Canary and Caribbean islands, South America), Great Britain (a union of England, Wales, Ireland, and Scotland formalized in 1707), and France. All of the sites discussed in this paper were occupied before the modern United States formed, but each site is referred to in terms of its present geopolitical affiliation. Thus, Charles Towne is referred to as being in South Carolina and St. Augustine is referred to as being in Florida. Neither state existed during our study period, but the political situation was so fluid into the 1800s that a detailed recital of changing colonial boundaries and claims would needlessly complicate the discussion.

Differences among vertebrate collections often are attributed to ethnicity, though it is difficult to link specific zooarchaeological collections with a single ethnic group in a region where social ties were fluid and political dominance changed hands among Spanish, English/British, French, and American authorities within less than 300 years. Each colonial population and each site's occupants were much more diverse than these political affiliations imply (e.g., Deagan 1973; Joseph and Zierden 2002). Individuals in each colony may have originated in Europe, in Africa, or in other colonies claimed by another European power, either directly or indirectly (e.g., Reitz et al. 2010, pp. 20–29; VanDerwarker et al. 2013). Some colonists originated at outposts in Spanish, British, and French colonies elsewhere in the Americas, or elsewhere in the emerging global network of these and other European nations. The national boundaries of European colonial powers were themselves in a state of flux. Regional differences existed within each of the “homelands” of the dominant political powers as these were slowly developing their present borders and identities. Further, the ethnic affiliation of a specific site's occupants at a given point in time does not always correspond with the identity of the prevailing political body. Africans were part of the colonial mix from the earliest days, often as slaves, but also as free people of color engaged in the colonial enterprise as skilled craftsmen, seamen, soldiers, farmers, and herders (Agha 2012, pp. 5, 23–24; Lyon 1976, pp. 49–50; Waselkov and Gums 2000, pp. 63–97). Some Africans may have come directly from Africa, others indirectly from other colonial settings. Native Americans, free and enslaved, from across the greater Southeast were present in all of these colonies (e.g., Agha 2012, pp. 20–28; Deagan 1973; Silvia 2002; Waselkov and Gums 2000, p. 39). The presence of people with very different perspectives on animal use and foodways from many different parts of the world is likely one of the principle explanations for the flexible and eclectic use of a wide array of indigenous and introduced animals seen in the colonial vertebrate evidence reviewed here.

“Southeastern Atlantic and Gulf of Mexico coastal plain” refers to the lower coastal plain of southeastern North America bounded by the Atlantic Ocean and the Gulf of Mexico and extending inland ca. 30–40 km to the upper limits of tidal influence (see Fig. 1). This is a region with similar biogeographical attributes throughout, including swamps, streams, flatwoods, maritime forests, and pinelands characteristic of the southern temperate deciduous forest biome (Shelford 1974, pp. 63–82). Colonists and Native Americans interacted over a much larger area, of course, but all of the sites in this study lie within this limited area. Spanish Florida included the northern Gulf of Mexico, peninsular Florida, the Georgia coast, and the Carolina coast from the 1500s into the 1800s. British and French authorities claimed much of this same area and occasionally governed parts of it. Although political boundaries were fluid, they were characterized by a steady retreat of Spanish interests in the face of advancing British ones after the 1670s, French ones after the 1680s, and American ones after 1776 (e.g., Bolton and Ross 1968; Wright 1971).

Spanish Florida

The Spanish settlement of St. Augustine is the oldest permanently occupied European-sponsored settlement in the United States and Canada. It began in 1565 when Pedro Menéndez de Avilés established an outpost in a Native American village on the Atlantic

coast of peninsular Florida (see Fig. 1; Table 1; Deagan 2012, pp. 10–14; Ewen 2009). Menéndez occupied houses in this village and fortified the site. The site, now known as Fountain of Youth Park (8SJ31), was attacked and burned by indigenous Timucuans in 1566, forcing Spanish colonists to relocate to a more secure location on a nearby island, eventually settling St. Augustine in its present location in 1572 (Deagan 2012, p. 20).

Spanish efforts to colonize this coastal environment were marked by a brief period of experimentation and the emergence of a new pattern of vertebrate use that persisted for centuries. Initially, attempts were made to introduce domestic livestock in proportions that maintained the traditional primacy of mutton and pork over other meats (Lyon 1976, p. 50). Sheep were important in the Iberian economy, but impractical in the warm, humid colony. When sheep failed, the gap was filled by wild species, especially marine fishes and shellfishes, and beef supplanted both mutton and pork as the major source of domestic animal protein. This transition occurred rapidly. The ability of cattle to be raised under a free-range regime became the basis of a flourishing cattle industry (Arnade 1961; Bushnell 1978).

Figure 2 summarizes the Minimum Number of Individuals (MNI, referred to as “individuals” below) and biomass estimates for wild and domestic vertebrates

Table 1 Sample characteristics

	MNI	NISP	Time period	Location	Reference
Fountain of Youth Park	142	5709	1565	St. Johns Co, FL	Orr and Colaninno 2008
St. Augustine, 16th century First Spanish Period	1126	43103	1572–1600	St. Johns Co, FL	Reitz et al. 2010
St. Augustine, 17th century First Spanish Period	166	6385	1600s	St. Johns Co, FL	Reitz 1992
St. Augustine, 18th century First Spanish Period	801	38581	1700–1763	St. Johns Co, FL	Reitz and Cumbaa 1983
St. Augustine, British Period	191	5697	1763–1783	St. Johns Co, FL	Reitz 1979; Reitz and Brown 1984
St. Augustine, Second Spanish Period	152	10735	1783–1821	St. Johns Co, FL	Reitz and Brown 1984
St. Giles Kussoe	12	250	1674–1684	Dorchester Co., SC	Reitz and Bergh 2012
Miller site (Charles Towne)	16	332	1670–1680	Charleston Co., SC	Reitz and Bergh 2012
Charleston	296	24943	1710–1760	Charleston Co., SC	Colaninno-Meeks and Reitz 2012; Zierden and Reitz 2009
Charleston	606	50990	1750s–1820s	Charleston Co., SC	Zierden and Reitz 2009
Charleston	892	46122	1820s–1880s	Charleston Co., SC	Zierden and Reitz 2009
Charleston	377	12253	1880s–1900	Charleston Co., SC	Zierden and Reitz 2009
Old Mobile	26	47384	1702–1711	Mobile Co., AL	Clute and Waselkov 2002
Krebs French/British	102	7664	1718–1780s	Jackson Co., MS	Gums and Waselkov 2014; Reitz et al. 2014
Krebs Spanish/Early American	57	4204	1780s–1850	Jackson Co., MS	Gums and Waselkov 2014; Reitz et al. 2014
Dog River	86	na	1725–1848	Mobile Co., AL	Waselkov and Gums 2000

recovered from the original Menéndez settlement. (See *Appendix* for a brief description of methods and analytical groups. These are discussed at length in Reitz et al. [2010, pp. 225–235] and Reitz and Wing 2008.) The vertebrate remains from Fountain of Youth Park exemplify characteristics that persisted for centuries at St. Augustine and other Atlantic coast settlements (e.g., Orr and Colaninno 2008; Reitz 1991, 1992, 1993, 1994; Reitz and Cumbaa 1983; Reitz et al. 2010; Reitz and Scarry 1985). The primary change over this time was the dominance of beef over pork (Fig. 3). Although domestic meats never completely replaced wild vertebrate sources of meat, particularly fish, by the time Spain ceded Florida to the United States in 1821, meat from domestic mammals contributed over half of the vertebrate biomass in St. Augustine collections. Nonetheless, wild vertebrates, particularly fishes, remained a consistent part of the vertebrate record despite the cattle industry (Reitz et al. 2010, pp. 82–83).

The British Carolinas

This early and persistent combination of local wild and introduced domestic animals was not unique to Spanish Florida. A similar pattern is found in vertebrate collections from two seventeenth-century British sites in South Carolina (see Fig. 1; see Table 1; Colaninno-Meeks and Reitz 2012; Reitz and Bergh 2012; Zierden and Reitz 2009). Charles Towne was founded in 1670 and relocated in 1680 to a more defensible location closer to the harbor. In 1783 the town was renamed Charleston (Saunders 2002). In the following review, “Charles Towne” refers to the first location and “Charleston” refers to the second location.

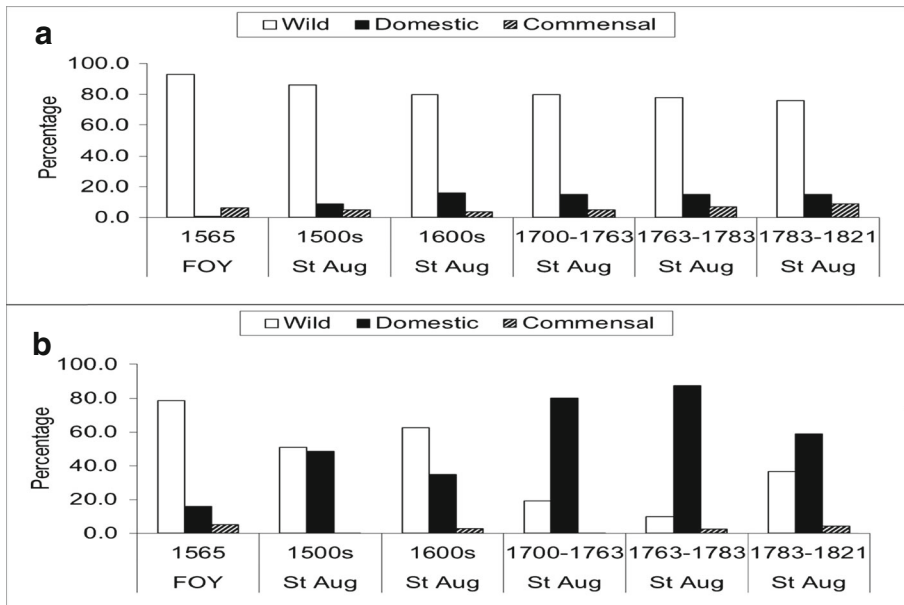


Fig. 2 Wild, domestic, and commensal vertebrate summary, Spanish collections, (a) minimum number of individuals (b) biomass. Key: FOY, Fountain of Youth Park; St Aug, St. Augustine. Data from Orr and Colaninno 2008; Reitz 1979, 1992; Reitz and Brown 1984; Reitz and Cumbaa 1983; Reitz et al. 2010

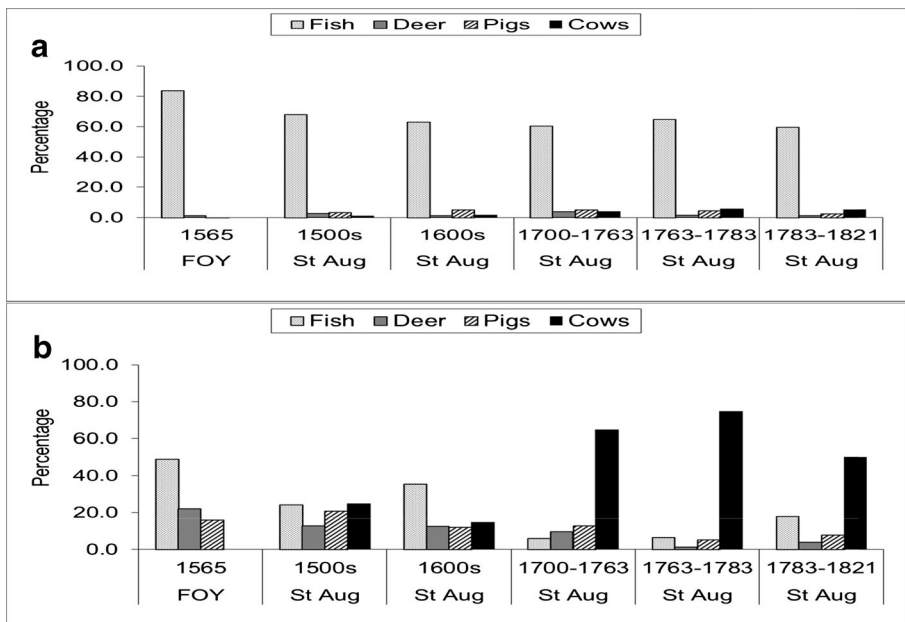


Fig. 3 Fish, deer, pig, and cow summary, Spanish collections, (a) minimum number of individuals (b) biomass. Key: FOY, Fountain of Youth Park; St Aug, St. Augustine. Data from Orr and Colaninno 2008; Reitz 1979, 1992; Reitz and Brown 1984; Reitz and Cumbaa 1983; Reitz et al. 2010

The earliest data for the British Carolinas reviewed here are from sites associated with Charles Towne. One of these early sites is the St. Giles Kussoe House/Lord Ashley settlement and trading post (38DR83A) (Agha 2012; Agha and Philips 2010). Lord Anthony Ashley Cooper was one of the original eight Lord Proprietors of the Carolina settlement and St. Giles Kussoe was the last of the major Proprietor plantations established in the area (Agha 2012, pp. 8–19). The primary economic activities at St. Giles Kussoe were cattle ranching and trade with Native Americans. By 1682, there were nearly 600 head of cattle at St. Giles Kussoe (Agha and Philips 2010, p. 13). The second early site is known as the Miller site (38CH1-MS) (Jones and Beeby 2010). This may have been a tavern operating just outside Charles Towne’s palisade between 1670 and 1680.

Local wild vertebrates were merged with domestic animals to form a tradition dominated by animals that could flourish in the coastal environment, as at St. Augustine. In this case, indigenous wild animals contribute most of the vertebrate individuals, but a small percentage of the biomass (Fig. 4; Reitz and Bergh 2012). Most of the wild vertebrates are fishes, turtles, opossums, and raccoons. The low percentage of wild biomass reflects the dominance of beef (Fig. 5). Beef constitutes over half of the Charles Towne biomass, a characteristic that persists through the 1800s in Charleston (Colaninno-Meeks and Reitz 2012; Zierden and Reitz 2009).

Most of the cattle specimens recovered from Charles Towne are teeth and skull fragments. This may reflect taphonomic processes that enabled only the most durable skeletal portions to survive; or it may reflect choices made in the distribution of cattle and cattle products, an early and significant part of the colonial economy until the decline of the cattle industry in the mid to late 1700s.

The French Gulf Coast

A similar initial use of wild animals persisting into the 1800s is found in vertebrate assemblages from French settlements on the northern coast of the Gulf of Mexico (see Fig. 1; see Table 1; Hardy 2011; Scott 2001; Scott and Dawdy 2011; Waselkov 2009). French colonists elsewhere in North America had developed economic strategies that relied on both wild and domestic animals, though proportions ranged from an abundant use of wild species (Bernard 2013; Cumbaa 1976; Martin 2008; Scott 1985) to a sparse use of wild species (Cossette 1995; Nicol 1983; Ostéothèque de Montréal 1998; Still 1984), reflecting differences in time and place.

The earliest of the French deposits on the northern Gulf coast are those from Old Mobile, Alabama (1 MB94), established on the Mobile River in 1702 and abandoned in 1711 (Waselkov 2002). On his way to establish the colony of Louisiane, Pierre Le Moynes d'Iberville stopped at the French colony of Saint-Domingue (modern Haiti), recently usurped from Spanish control on Hispaniola. Iberville took on cattle and hogs during that layover (Clute and Waselkov 2002). These likely were descendants of the thriving free-range Spanish herds left behind when Spain abandoned the western side of Hispaniola in 1605 (Deagan and Reitz 1995; Reitz and McEwan 1995). In 1699 Iberville established a post on Biloxi Bay, but abandoned this in favor of the Old Mobile location. Subsequently, colonists at Old Mobile obtained provisions from

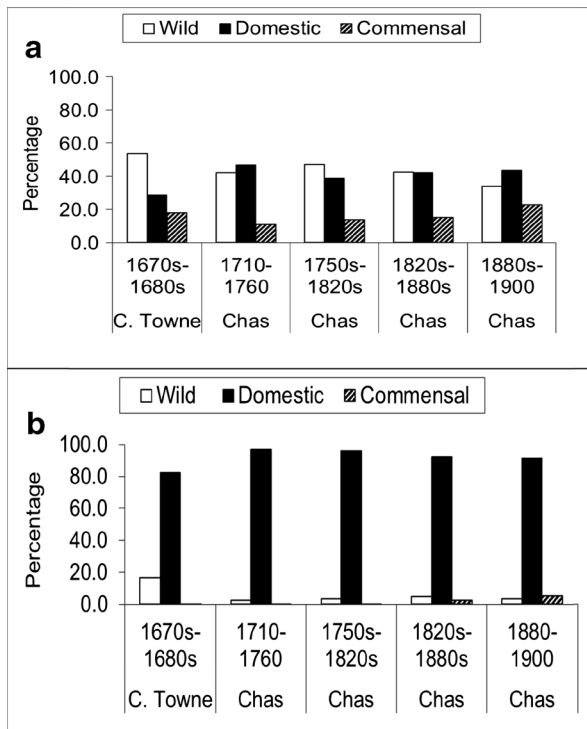


Fig. 4 Wild, domestic, and commensal vertebrate summary, British collections, (a) minimum number of individuals (b) biomass. Key: C. Towne, Charles Towne; Chas, Charleston. Data from Reitz and Bergh 2012; Zierden and Reitz 2009

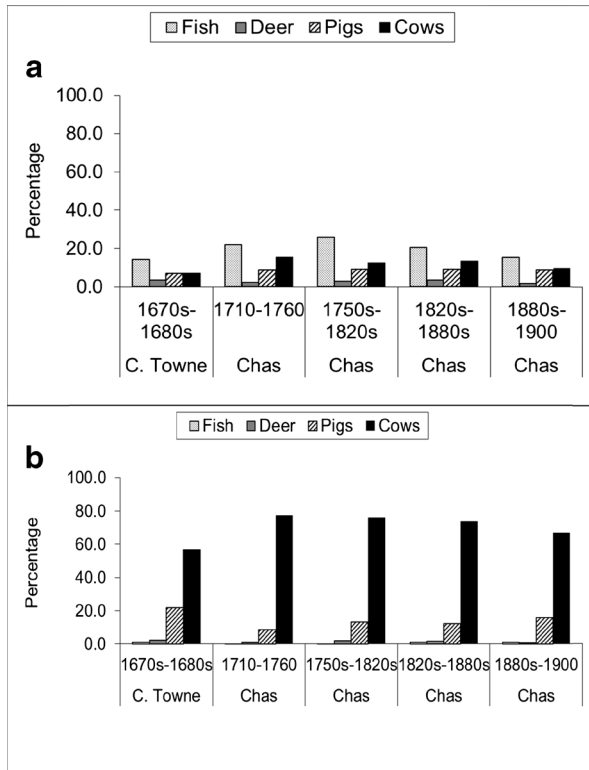


Fig. 5 Fish, deer, pig, and cow summary, British collections, (a) minimum number of individuals (b) biomass. Key: C. Towne, Charles Towne; Chas, Charleston. Data from Reitz and Bergh 2012; Zierden and Reitz 2009

France, local Indians, and the Spanish ports of Pensacola (Florida), Havana (Cuba), and Veracruz (Mexico) (Clute and Waselkov 2002). In addition to Spanish contacts, Old Mobile had a major Native American presence and a small African one.

Despite efforts to obtain livestock, local wild animals constitute most of the vertebrate individuals and biomass in the Old Mobile collection (Fig. 6; Clute and Waselkov 2002). This early deposit contains no remains of cattle, sheep, or goats, though pigs and chickens are present, an assessment supported by the colony's first census in which about 100 pigs and 400 chickens are enumerated compared to 32 oxen, bulls, cows, and calves (Rowland and Sanders 1929, p. 20). Sheep failed for French colonists on the Gulf coast in the eighteenth century, just as they had for Spanish colonists in the sixteenth century and British colonists in the seventeenth century. The dominant source of vertebrate protein in the Old Mobile collection is venison (Fig. 7).

Vertebrate remains from La Pointe-Krebs site expand the study of French colonial economies to include data from a plantation owned continuously by the same family, despite frequent political changes. The plantation known as La Pointe-Krebs (22JA526; Mississippi) was occupied by peoples of Native American, African, and European ancestries (Gums and Waselkov 2014). Joseph Simon de la Pointe, born in Quebec, Nouvelle France, established one of the first colonial plantations on the French Gulf coast ca. 1718. In the 1740s, the property came to be known as the La Pointe-Krebs Plantation when a La Pointe daughter married Hugo Ernestus Krebs, an Alsatian.

Vertebrate remains from La Pointe-Krebs are associated with four political regimes: French colonial (ca. 1718–63), British colonial (1763–80), Spanish colonial (1780–1813), and early American (1813–50). Deposits from these four brief regimes are difficult to isolate from each other, and some archaeological features span multiple time periods. For this reason, vertebrate remains are assigned to one of two broader time periods: French/British (1718–80) and Spanish/early American (1780s–1850). Members of the Krebs family lived at the plantation until 1940, despite these political changes. Thus, site residents who generated the archaeological assemblages comprised just two groups, members of the La Pointe-Krebs family and enslaved Africans. Given this remarkable continuity in ownership and social identities, changes in vertebrate use at this site likely reflect shifts in local conditions, and the household’s responses to broader processes occurring throughout the Southeast as American states emerged from colonial rule, more than changes in ethnicity, status, or other social attributions.

As occurred at early colonial sites in Spanish Florida and British Carolina, residents at La Pointe-Krebs combined local wild vertebrates with introduced domestic ones (see Figs. 6 and 7; Reitz et al. 2014). Wild vertebrates, primarily fishes and deer, dominate the individuals and contribute much of the biomass. The use of wild individuals was remarkably stable into the 1850s, though the balance between wild and domestic

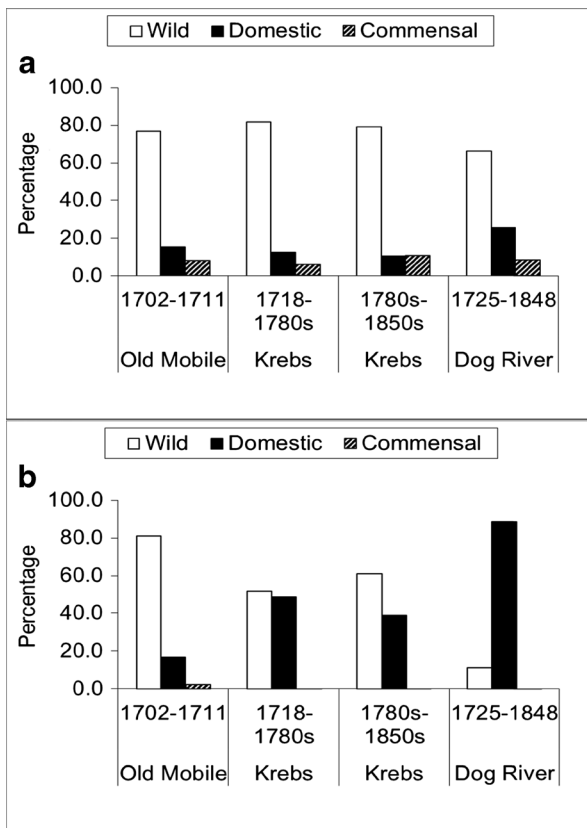


Fig. 6 Wild, domestic, and commensal vertebrate summary, French collections, (a) minimum number of individuals (b) biomass. Data from Clute and Waselkov 2002; Reitz et al. 2014; Waselkov and Gums 2000

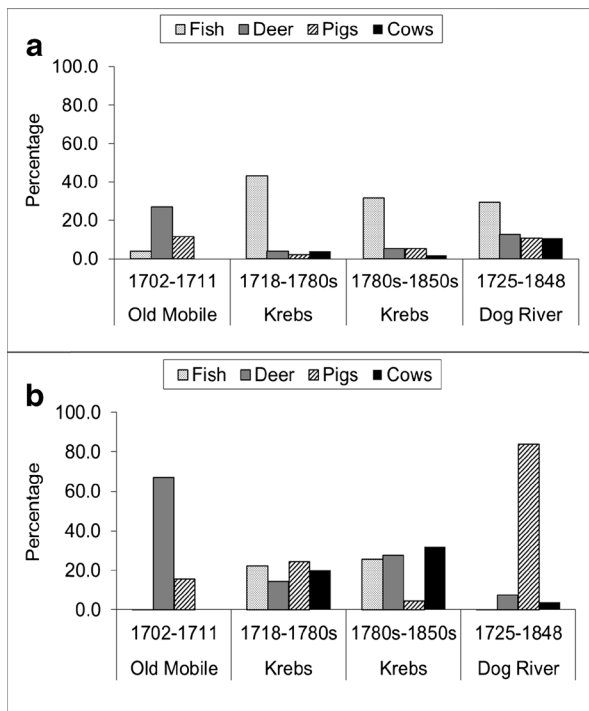


Fig. 7 Fish, deer, pig, and cow summary, French collections, (a) minimum number of individuals (b) biomass. Data from Clute and Waselkov 2002; Reitz et al. 2014; Waselkov and Gums 2000

sources of biomass is more varied, reflecting a substantial decline in pork accompanied by increases in venison and beef.

French-affiliated data are less robust than those from Spanish Florida and British South Carolina; therefore, data from the Dog River Plantation (1 MB161, Rivière aux Chiens, Alabama) are included for comparative purposes. This plantation was occupied between 1725 and 1848 by Native Americans, Africans, French Canadians, and a few people from France itself (Waselkov and Gums 2000, pp. 98–106). During this time, political authority passed from French to British, to Spanish, and, finally, to American hands, though ownership remained in the hands of three generations of the Rochon-Demuy family until 1830. Animal use at this site was dissimilar in some respects to that at other French-affiliated sites (see Figs. 6 and 7). Nonetheless, both indigenous and introduced vertebrates were used; wild vertebrates provide two-thirds of the individuals, though a small percentage of the biomass. Nine of the domestic mammals in the Dog River collection are pigs and nine are cows, though pork provides most of the estimated biomass. Evidence for a tannery at the Dog River site reminds us that animals serve functions other than food. Many of the cow remains were associated with two wooden tanning vats, perhaps in use during the 1830s and 1840s, but continuing a colonial practice documented historically for the Rochon family (Waselkov and Gums 2000, pp. 208–210). This use of cattle hides may explain the prominence of pork in the estimated biomass, if cattle waste was discarded elsewhere because of tanning or other livestock operations.

A New Cultural Form

Similarities, differences, and changes over time found in vertebrate assemblages from these three colonial settings reflect taphonomic processes, site and activity area functions, analytical biases, and broader social, economic, political, and environmental phenomena. It is clear, however, that colonists at all three locations used both wild and domestic vertebrates from the very beginning of each colony and that these patterns of use persisted into the 1800s (Figs. 8 and 9). Only in the biomass sources at St. Augustine is there a marked difference in the balance between wild and domestic sources of meat over time. The dominant sources of meat at these sites, regardless of the political affiliation of the colony, were generally fishes, deer, pigs, and cows. The fishes were almost entirely from inshore estuarine waters, with little or no evidence of off-shore fishing or imported fish, such as Atlantic cod (*Gadus morhua*).

Social explanations for the similarities and differences among these collections include: national origins and ethnicity, exchanges between Native Americans and colonists; adaptations, mimicry, or invention on the part of colonists; African influences; and broader economic patterns as American states emerged from multi-national colonies. Each of these social explanations likely had a role, as did environmental conditions, and each is reviewed in this section.

There appears to be little evidence that the national origins or ethnic identities of settlers informed basic decisions about animal use at these multi-ethnic “first” colonies. When it came to decisions about animal use, formal geopolitical claims had only a minor influence. People at each colony, as well as their local social and economic connections, were much more diverse than the dominant political identities of each colony implies. Even when the identity of the colonists changed, early habits of animal use persisted. For example, most of the Spaniards, and those Africans and Native Americans closely affiliated with them, evacuated St. Augustine at the start of the British Period (1763–83). Yet the pattern of animal use in the late First Spanish Period (1700–63) continued into the subsequent British Period and beyond (see Figs. 2 and 3). A wide variety of stimuli and responses occurred within each colonial setting, reflecting the skills, opportunities, resources, inclinations, and social affiliations of individual colonists. Given that these were multi-ethnic colonies, territories, and, subsequently, states, the similarities in animal use within each of these colonies and the persistence of the choices represented in the vertebrate collections suggests that local factors were more significant in forming patterns of animal use than were geopolitical affiliations.

Close ties between Native Americans and early immigrants to these colonies might explain the initial prominence of wild animals in these collections. Trade between local indigenous communities and colonists was a widespread and fundamental aspect of all three colonial economies. Many colonists traded for local commodities that could be exported in addition to goods for local use. Other colonists commandeered resources in the form of tithes and tribute, relied upon enslaved native peoples to provide them, or simply took what they wanted. Some Native Americans were slaves and others were allied with colonists of European or African descent through marriage or other social ties (e.g., Agha 2012, pp. 4–5; Deagan 1973; Waselkov and Gums 2000, pp. 34–35). Reciprocity within kin groups is a particularly likely source of wild products given the presence of Native American women in some households. Many of the goods available from Native Americans were the typical local fare, featuring primarily fish, shellfish,

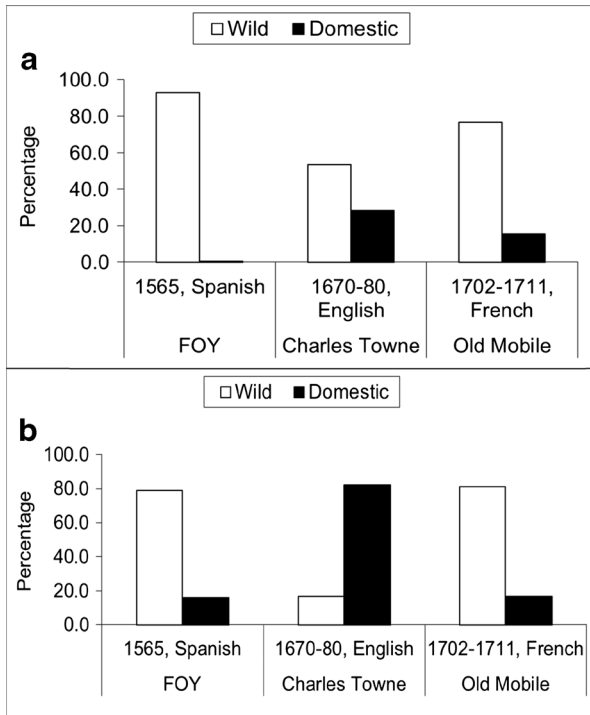


Fig. 8 Wild and domestic vertebrate summary, early collections, (a) minimum number of individuals (b) biomass

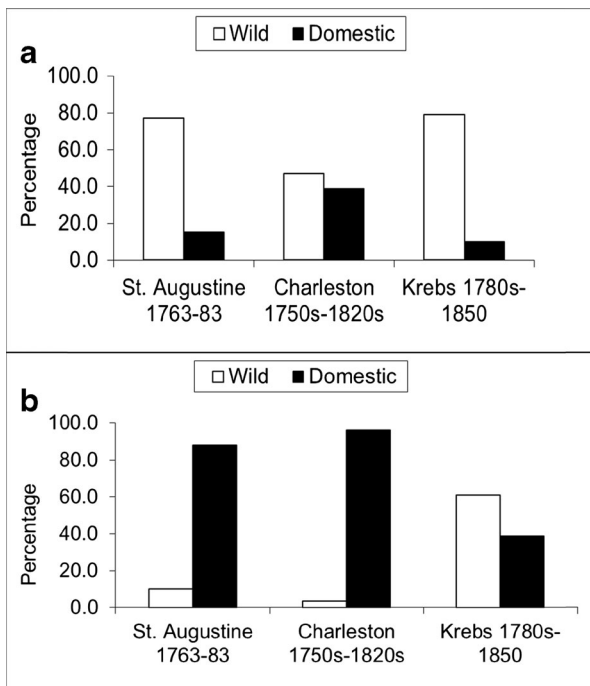


Fig 9 Wild and domestic vertebrate summary, later collections, (a) minimum number of individuals (b) biomass

turtle meat, and venison, and these meats continued to be used into the nineteenth century even after the extinction, relocation, or removal of many coastal Native American populations.

Looked at from the colonists' perspectives, these results likely represent periods of experimentation and adjustment that were critical to their survival. Such periods are predicted for new immigrants in novel environments. Bökönyi (1975, p. 4) argues that when people with an animal husbandry tradition immigrate into a region where animal husbandry is unknown, settlers attempt to maintain their original husbandry system nonetheless. People would do this even when the original system (e.g., sheep husbandry) is unproductive in the new environment, initially compensating for shortfalls by increasing their use of wild animals, and subsequently incorporating a different suite of domestic resources as colonial economies matured. Despite differences among collections from Fountain of Youth Park, Charles Towne, and Old Mobile, Bökönyi's prediction broadly does characterize the rapidity with which traditional local resources and techniques were incorporated into colonial economies and diets.

Colonists confronted with the failure of traditional animal husbandry had good examples before them of successful strategies in the subsistence practices of their Native American neighbors and trading partners. Early European and African colonists resided among indigenous populations whose economies were based on a set of cultivated plants adapted to local environments and a complex of local wild animals (e.g., Gremillion 1993, 1995, 2002). Colonists could have mimicked those examples without relying upon local indigenous knowledge or instruction.

Some aspects of these new strategies might be inventive adaptations that would have developed even in the absence of the examples offered by local indigenous populations or their contributions to colonial economies. Evidence for this is seen in the similarities in animal use by early European and African settlers in three different colonies on the southeastern Atlantic and Gulf coasts during three different centuries. Elements of these early colonial strategies persisted for centuries after native populations were extinct or dispersed (Reitz 1986, 1994; Reitz and Bergh 2012; Reitz and Cumbaa 1983; Reitz et al. 1985; Reitz and Honerkamp 1983; Reitz et al. 2010; Zierden and Reitz 2009). The Spanish colonial effort preceded British and French ones by many decades, with frequent interactions between Spanish Florida and the later British and French colonies, both of which were established within territory claimed by Spain. We think it probable that the Spanish model served as an important example for later colonists on how to live on the coasts of southeastern North America.

The similar characteristics of these colonial economies might reflect African influences, instead of Native American ones. Africans were also strangers in a strange land, however, and had to learn productive techniques just as other colonists, including Native American colonists from other parts of the Americas, had to do. Given that many early Africans were skilled in trades, as well as in producing commodities such as navel stores, cattle, rice, cotton, and indigo, it is unlikely much of their valuable labor was spent on tasks that could be performed by others, perhaps more efficiently. The free African community of Gracia Real de Santa Teresa de Mose, located just north of St. Augustine in the early 1700s, followed a subsistence strategy very similar to the local Native American one (Reitz 1994).

Within this broad pattern, however, are differences in the details at each location. Perhaps most glaring, and most inexplicable, is the low use of fish at Charles Towne,

and later in Charleston, compared to St. Augustine and La Pointe-Krebs (see Figs. 3, 5, and 7). This British Carolina characteristic persisted into the 1800s. It cannot be attributed to a British dislike for fish, because many Charlestonians took refuge or were incarcerated in St. Augustine late in the British Period, during the American Revolution (1775–83). While in St. Augustine, Charlestonians and Britons ate fish. Nor is this difference attributable to a Catholic or Protestant dietary restriction. Virtually the entire Catholic population evacuated St. Augustine in 1763, at the end of the First Spanish Period, when the colony was ceded briefly to Protestant Britain; yet fish consumption continued into the British Period and even into the Second Spanish Period (1783–1821), when the peninsula was nominally governed by Spain but largely occupied by American Loyalists.

The data summarized here suggest the emergence of a broad pattern that transcends ethnicity or political ties. Although many aspects of animal use in every colony had an indigenous flavor, each merged these local wild elements with European ingredients, creating a new cultural form within a few decades in each colony, new forms that cannot be traced back to exclusively Native American, European, or African traditions. Subsequent changes reflect developments in local conditions and the broader political and economic arena experienced throughout the Southeast as American states emerged from colonial rule. This broad regional trend began at early colonial sites in the coastal Southeast and persisted into the eighteenth and nineteenth centuries (Reitz 1992; Reitz and Cumbaa 1983; Reitz et al. 2010; Zierden and Reitz 2009).

Cattle and Climate Change

Two other aspects of these early colonies may have played a role in the strategies followed in each and they require special mention. One of these is the success of the early cattle industry and its subsequent decline. The other is climate change associated with the Little Ice Age.

Although southern plantations of the late 1700s and 1800s concentrated on commercial production for overseas markets of crops such as indigo, rice, tobacco, and cotton, beef production was important in the early Spanish, French, and British colonial economies (Arnade 1961; Bushnell 1978; Groover and Brooks 2003; Miller Surrey 2006, pp. 253–258, 283; Otto 1986, 1987; Stewart 1991). Cattle were largely managed under an open-range system (Arnade 1961; Bushnell 1978; Dunbar 1961). The term “cow hunter,” used to describe the people who worked with these colonial-era cattle, suggests the feral nature of animals and the prevailing herd management strategy. It was the responsibility of farmers to fence their crops to keep cattle out rather than the responsibility of ranchers to fence cattle in (Agha 2012, p. 20; Otto 1986; Stewart 1991), a custom that caused considerable friction when colonial herd encroached on unfenced native fields (Sheldon et al. 2008).

Initially, cattle thrived in the pinewoods, canebrakes, and marshes of the coast, where winters are generally mild and forage is available throughout the year. Calves and nursing females might be penned to keep them from running wild, but most cattle had little or no supplemental food or shelter (Groover and Brooks 2003; Otto 1986; Stewart 1991). These coasts experience natural fires and favorable pastures sometimes were maintained and enlarged through set fires (Dunbar 1961). Rural cattle centers of

the colonial British Southeast might encompass 100–500 ac (40–202 ha) with clusters of corrals, outbuildings, living quarters, and gardens. Herds might have 1,000–6,000 head, suggesting that landscape modification, especially overgrazing, and rapid spread of infectious diseases were likely (Dunbar 1961; Haygood 1986; Otto 1987; Stewart 1991). Cattle hands could be Africans, Europeans, or Native Americans skilled in cattle hunting or herding (Dunbar 1961; Otto 1986, 1987; Rowland et al. 1984, p. 87).

Otto (1986) describes an annual cycle in British colonies in which fields were burned in the winter to improve forage, beef cattle were rounded up for slaughter in the fall, and meat salted for sale in the West Indies. Live cattle, preserved meats, and tanned hides were shipped from rural cattle centers to Charles Towne/Charleston, and thence to other markets (Otto 1986; Stewart 1991). The Carolina colony, for example, shipped 4 T (3.6mT) of salt meat to Barbados in 1680 (Otto 1987). Beef production was accompanied by limited milk production in some cases. Spanish cattle ranches in Florida were equally productive before they were destroyed by British raids between 1702 and 1704. Prior to these raids, there had been an active, though often illicit, trade with markets in the Caribbean and along the Gulf coast (e.g., Bushnell 1981, pp. 90–91, 128).

The cattle industry in the Carolinas and Georgia, by this time under British control, began to decline in the mid-1700s. Epidemics in 1742 and 1743, for example, killed many cattle in the British colonies (Dunbar 1961; Otto 1986; Stewart 1991). French cattle suffered from the same or a similar contagion between 1748 and 1751 (Miller Surrey 2006, pp. 258–259). The decline was sudden and dramatic, characteristic of a new disease infecting a virgin population (Haygood 1986). Georgia cattle were implicated in the spread of the epidemic, which was said to have originated among Spanish cattle (Haygood 1986). One of the diseases, known as “Spanish staggers” (*aka* Texas or Southern fever), may be babesiosis, characterized by massive organ damage caused by a tick-borne red-blood-cell parasite (*Babesia* spp.). Animals with acquired immunity have a low-grade infection and are carriers of the disease, but must be re-infected to sustain immunity. The disease favors warm weather and swampy conditions and is economically the most important arthropod-transmitted pathogen of cattle (Haygood 1986; Schnittger et al. 2012; Stewart 1991). It also infects deer (Ramos et al. 2010).

Babesiosis is believed to be the cause of disease outbreaks in the Carolinas in the 1760s–70s, perhaps earlier, and similar diseases in locations to the west, including Alabama and Mississippi in later decades (Haygood 1986; Stewart 1991). Following the outbreaks in the 1760s–70s, restrictions were imposed on moving cattle from the Carolina and Georgia pinewoods (Bierer 1939, pp. 6, 8). Severe outbreaks occurred during the nineteenth century when infected cattle from Texas were trailed north. The Texas cattle were asymptomatic carriers, as exposure to the parasite when they were calves provided partial immunity, leaving early ranchers uncertain about the cause (e.g., Haygood 1986). It brought an end to the famous cattle trail drives of the nineteenth century as northern states restricted the movement of “Texas animals” through their territory to control this disease (Haygood 1986). Once established, babesiosis occurred throughout the United States below the 36th parallel before extensive tick control programs in the late-nineteenth and early twentieth centuries eradicated the vector. A lack of awareness of the seriousness of babesiosis outbreaks in colonial herds may explain why archaeological interpretations have not yet included this environmental variable in accounts of shifting colonial subsistence patterns.

The decline in cattle herding in the southeastern coastal colonies could have been due to better economic opportunities with other commodities, to a shift in markets such that the archaeological evidence of cattle use (skeletal remains) were discarded elsewhere, or to overcrowding and disease, to which it is often attributed. Declines in cattle biomass at all three colonial locations after the mid-1700s may be evidence of this disease's impact on local beef production (see Figs. 3, 5 and 7). Establishment of the French colony on the northern Gulf coast had the misfortune of coinciding with the spread of babesiosis, which could explain the generally lower levels of beef in the French collections compared to roughly contemporaneous collections from the other two colonies.

Another explanation for conditions observed in the 1700s may be climate-related landscape changes associated with the Little Ice Age (1300–1870). Multiple proxies associate a widespread North American “megadrought” with the inability of Spanish and British colonies to thrive (Blanton 2000; Blanton and Thomas 2008, p. 801; deMenocal 2001; Harding et al. 2010; Mann et al. 2008; Marcott et al. 2013; Stahle and Cleaveland 1994; Stahle et al. 1998; Willard et al. 2003). Oscillating periods of wetter-warmer/drier-colder conditions are documented for both the 1600s and 1700s in this area (Anderson et al. 1995; Blanton 2004). These, or similar climate oscillations, likely did influence colonial enterprises on both coasts and also may have played a role in the early rise and subsequent decline of cattle ranching.

Discussion

The patterns of animal use that emerged at early colonies on the southeastern coasts of North America represent eclectic fusions of indigenous and introduced animals, forming similar patterns of animal use. Colonists continued to use a suite of Eurasian domestic animals, but the main source of meat within that suite was generally beef. The most distinctive aspect of these colonial strategies, however, was the combination of beef with a broad array of indigenous wild animals. The colonial strategy was largely a self-reliant, local one with the addition of those introduced animals that prospered in humid, low-lying coastal settings with minimal attention. As cattle declined, perhaps due to disease, agricultural commodities such as cotton became the basis of much of the regional economy. Although animal use was molded in part by disease and environmental conditions, it also was shaped by interactions between colonists and Native Americans, which likely played significant roles in early Spanish, British, and French strategies during the initial years of each colony.

The role of human agency in culture contact and change has long been a focus of historical archaeology in the Americas, with a great deal of debate over terminology (e.g., see Majewski and Gaimster 2009 for definitions). On the southeastern coasts, these processes often are termed *mestizaje* (Deagan 1973), transculturation and ethnogenesis (Deagan 1998), dietary acculturation (Gremillion 2002), or creolization (Hardy 2011), with different implications for each term. A fundamental distinction among these concepts is whether the outcome is a mixture of several cultural strains, with roots that can be traced in a more or less linear fashion back to an original ancestry, or “a new cultural form with multiple origins and multiple active agents” (Deagan 1998, pp. 23, 25).

The exact ethnic or gender identity of each person involved in the chains of events that produced these collections is unknown. We do know, however, that each of these colonies, and probably each of the sites whose data are merged in this study, was occupied by people with many ethnic backgrounds. In colonial settings that clearly involved multiple agents with multiple origins, we can only guess at which traditions might prevail under which conditions. In the case of decisions related to animal use, geopolitical affiliation appears to have had little influence over which animals were used. These data more likely reflect pragmatic interactions among multiple human and non-human agents based on local social, economic, and environmental factors.

Vertebrate evidence from these early colonial sites suggests that the habits of animal use which emerged in each colony represent new cultural forms that cannot be traced back to a single ancestral tradition. They are the outcome of merging the traditions of everyone present in the colony. In colonial settings where multi-group interactions and exchange occurred, this new form was the outcome of dynamic exchanges, reformations, and inventions (Deagan 1998, pp. 27, 35). The vertebrate records from these three early coastal colonies indicate that transformations in animal use by colonists occurred almost immediately, with subsequent diverse characteristics reflecting factors such as access to external markets, animal health, and the physical landscape.

Social affiliations, reflecting ethnicity, gender, and other social distinctions, are publically expressed through culinary displays, food preparation, and material culture (Deagan 2003; Pavao-Zuckerman and Loren 2012; Reitz 1994; Reitz and Scarry 1985). Detailed studies of carcass preparation, cooking, and presentation methods at each colony might show differences in carcass-to-table practices reflecting and reinforcing such identities. In fact, fine-scaled zooarchaeological examinations of colonial cuisines would contribute substantially to overall understandings of ethnic identity maintenance and reinvention from the colonial era to the present. Our identification here of a general similarity in patterns of animal use on the Gulf and southeastern Atlantic coasts suggests that colonial regime boundaries had little impact on this level of subsistence strategy. This observation merely sets the stage for studies that employ archaeological evidence to trace the developments of modern-day regional cuisines.

Conclusions

This synthesis illustrates how it is as important to explore evidence for changes among the colonizers as it is among the colonized. The new cultural forms that emerged in these three colonies developed from multiple origins that cannot be traced back to a single ancestral tradition and reflect dynamic interactions among multiple human and non-human agents. Although each strategy had a uniquely local, indigenous flavor, it remained European in other ways, indicating that both ethnogenesis and adaptation were factors in the development of a variety of colonial patterns of resource use. Colonists at early colonies on the southeastern coasts of the Atlantic and Gulf of Mexico followed similar strategies: a broad-based reliance on local wild animals, particularly fishes and deer, combined with cattle and pigs. Yet the strategies that developed in each colonial setting were not identical to each other.

The vertebrate record from these southeastern coastal sites indicates that transformations occurred almost immediately, with the diversity in outcomes likely reflecting

interactions among local social, economic, and environmental factors. As a consequence of these interactions over time, use of wild game, particularly deer, declined while domestic meats increased as southeastern coastal colonies became nineteenth-century American states. But the new cultural forms that emerged in the colonial past persist as fundamental elements of regional southeastern coastal cuisines today. Likely such transformations, though with different outcomes, occurred in other colonial settings.

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Appendix

Methods Vertebrate remains were identified following standard zooarchaeological methods. Invertebrates typically are not studied at these sites because molluscs were used as a building material (e.g., tabby) and it is difficult to consistently distinguish between architectural uses and dietary ones. Most of the identifications were made using the comparative skeletal collection of the Zooarchaeology Laboratory, Georgia Museum of Natural History (GMNH), University of Georgia, and the Center for Archaeological Studies, University of South Alabama. For all collections except those from Old Mobile and Dog River, the Minimum Number of Individuals (MNI) is estimated based on paired elements, size, and age and biomass is estimated using the allometric equation: $Y = aX^b$. In this article, the term “individual” refers to MNI. The number of individuals is interpreted as a reflection of the frequency with which that resource was used. Biomass estimates are interpreted as evidence of dietary reliance. Deer, for example, might be a frequent dietary item, but not contribute large amounts of meat compared to other resources, which might not be slaughtered as frequently but, nonetheless, contribute larger quantities of meat. Species identified for all collections are summarized into wild, domestic, and commensal categories in order to contrast the percentages of various groups of taxa in each assemblage. Wild animals include sharks, rays, bony fishes, alligators, turtles, wild birds, and deer. Domestic animals include primarily pigs, cows, caprines, and chickens. Commensal taxa include animals such as frogs and toads (*Anura*), snakes (*Serpentes*), Eastern moles (*Scalopus aquaticus*), mice and rats (*Sigmodontidae*), dogs (*Canis familiaris*), cats (*Felis catus*), and horses or donkeys (*Equus* spp.; Reitz et al. 2010, p. 230; Zierden and Reitz 2009). Although commensal animals might be consumed, they are commonly found in close association with humans and their built environment as pets, vermin, or working animals. Just as

some of the animals in the commensal category might have been consumed, some animals classified as wild animals might have been commensal. Commensal animals are included in the calculations reported here, though their values are not included in all of the figures. In order to make comparisons of MNI and biomass estimates possible, the figures use biomass estimates only for those taxa for which MNI is estimated. Readers should consult Reitz and Wing (2008) or Reitz et al. (2010) and references cited for additional information about these methods and categories.

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