AN ANALYSIS OF FAUNAL REMAINS FROM WYNNEWOOD STATE HISTORIC SITE, SUMNER COUNTY, TENNESSEE AND ITS IMPLICATIONS TO TENNESSEE PLANTATION SITE ARCHAEOLOGY IN THE CENTRAL BASIN

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ABSTRACT

Faunal remains recovered from Feature 12 at the Wynnewood State Historic Site are examined. Seasonal placement of Feature 12 use is proposed, and the dietary patterns of site occupants evaluated. The results of the data analysis are evaluated against documentary evidence (U. S. Census Schedules, Productions of Agriculture). The patterned nature of the archaeological and archival data for three other examined Central Basin plantation sites (the Hermitage, Belle Meade, and Woodlawn) resulted in the proposal of a model for Middle Tennessee plantation site domestic mammal utilization.

INTRODUCTION

In 1981 construction activities at the Wynnewood State Historic Site, a mid-nineteenth-century farm/health resort located in Sumner County, Tennessee, exposed an unusually large refuse pit (Feature 12) containing over 11,700 artifacts representing mid-nineteenth-century farm/resort activity. Approximately 50 percent of the material (5,749 specimens) was composed of animal remains discarded by the inhabitants of the farm/resort. Smith's (preceding article) goal was to place the material in its proper chronological context by the use of South's (1977:201-271) Mean Ceramic Date Formula, identify the site-specific function of the feature, and explore the broader socioeconomic and sociocultural implications of the deposit. Briefly, Smith found that the feature dated to about 1839, the contents of the feature suggested a direct kitchen to feature discard flow, and the contents most likely reflected the discardment of refuse produced by the upper-class rural-domestic family operators of the farm/resort and by their clientele.

OBJECTIVE

The purpose of examining the faunal remains recovered from Feature 12 involved several lines of investigation. The initial goal was to identify the types of animal species incorporated in the diet and identify the dietary composition of utilized animal species. The second goal was to employ the represented faunal remains as ancillary evidence to further refine the chronological placement (i.e., seasonality) of resort-related activity. The third aim was to provide a corpus of data to compare archaeologically derived information to the available historic documents (i.e., U. S. Census Schedules,

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Productions of Agriculture). The final aim was to provide a set of data comparable to other nineteenth-century Middle Tennessee sites of similar socioeconomic and sociocultural standing.

METHODS OF ANALYSIS

The analysis of Feature 12 faunal remains entailed the examination of all recovered specimens with reference to excavation provenience. Each specimen, when possible, was identified to species, anatomical portion and side, and observed for evidence indicative of butchering procedures. All of the information gathered during this phase of analysis was entered in an inventory of faunal remains (Breitburg 1983a: Appendix I*) according to identifiable taxon or classified as indeterminate mammal, bird, reptile, amphibian, fish, or mollusk. Following this procedure the material was tabulated according to the information provided by the field archaeologist. This phase of the analysis involved grouping the material with reference to stratigraphic association for each significant cultural deposit. These data are presented in Appendix I and Table 2 (a listing of the frequency of skeletal portions) in the previous report (Brietburg 1983a). Subsequently, the material recovered from Feature 12 in 1981 was added to that recovered in 1975 (Smith 1975; Breitburg 1983a: Appendix II and Table 3). The information was used to determine the distribution of bone, the bone composition of identified animal species, and dietary composition of site inhabitants by computing dietary ratios as proposed by White (1953). These compendia also were employed to determine the minimum number of individuals (MNI) of respective species identified in the sample, and the frequency of specimens exhibiting butchering evidence or other type of modification.

RESULTS OF ANALYSIS

Bone and Species Composition

Of the 5,749 fragments of bone and shell associated with Feature 12, slightly more than 900 (15.7 percent) identifiable specimens represent 11 mammals, 6 genera and species of birds, 3 genera and species of turtles, 2 families of fish, and 3 genera and species of freshwater mussels and aquatic snails (Table 1). Approximately 97 percent (879 specimens) of the identifiable remains associated with Feature 12 consists of skeletal portions of domestic mammals (cow, pig, and sheep). Domestic pig remains (546 specimens or about 60 percent of the identifiable remains) were the most common skeletal fragments recorded, while the remains of domestic cow (253 specimens or 28 percent of the identified remains) were second in the frequency of representation and sheep (42 specimens or about 5 percent) accounted for the third most common species represented by skeletal fragments. Seven percent of the identifiable material (64 specimens) represents skeletal fragments of white-tailed deer, domestic cat, raccoon, probably brown rat, gray squirrel, cottontail rabbit, common mole, opossum, common crow, mourning dove, domestic chicken, domestic/wild turkey, quail, pond terrapin, box

*On file at the Tennessee Division of Archaeology, Nashville

Table 1. Faunal remains recovered from the 1975 and 1981 excavations at Wynnewood State Historic Site.

	1981		1975 Excavation												
	Fea. 12 Frags.	MNI	Spencer Tree Site	Main House Area	School Site	Doctor's House	Smoke-house	Back-yard	N. Guest Cottage Row	S. Guest Cottage Row	Slave Cabin # 2	Slave Cabin # 3	East Tract	Sub-Total	Total
MAMMALIA-MAMMALS	879	34	1(1)	1(1)	19(4)	5(2)	68(3)	8(2)	1(1)	18(3)	314(11)	30(5)	72(7)	537	1416(45)
Ovis aries, Domestic sheep	42	4	-	-	-	-	-	-	-	-	12(1)	3(1)	-	15	57(4)
Bos taurus, Domestic cow	253	5	-	-	7(1)	-	2(1)	1(1)	-	2(1)	9(1)	-	9(1)	30	283(6)
Odocoileus virginianus, White-tailed deer	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
Sus scrofa, Domestic pig	546	14	-	1(1)	7(1)	3(1)	66(2)	7(1)	1(1)	15(1)	172(2)	21(1)	30(1)	323	869(16)
Felis domesticus, Domestic cat	*	2	-	-	-	-	-	-	-	-	1(1)	-	-	1	1(2)
Procyon lotor, Raccoon	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2(1)
Canis familiaris, Domestic dog	-	-	-	-	1(1)	-	-	-	-	-	-	-	-	1	1(1)
Rattus cf. norvegicus, Brown rat	19	1	-	-	4(1)	-	-	-	-	-	100(3)	-	8(1)	112	131(4)
Sciurus carolinensis, Eastern gray squirrel	3	2	-	-	-	-	-	-	-	1(1)	12(1)	1(1)	9(1)	23	26(3)
Sylvilagus floridanus, Cottontail rabbit	4	1	1(1)	-	-	2(1)	-	-	-	-	7(1)	1(1)	12(1)	23	27(2)
Scalopus aquaticus, Common mole	5	1	-	-	-	-	-	-	-	-	1(1)	4(1)	4(1)	9	14(3)
Didelphis marsupialis, Opossum	4	2	-	-	-	-	-	-	-	-	-	-	-	-	4(2)
AVES-BIRDS	14	6	-	-	1(1)	4(2)	3(3)	1(1)	1(1)	1(1)	39(2)	11(2)	48(8)	109	123(12)
Corvus brachyrhynchos, Common crow	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2(1)
Zenaidura macroura, Mourning dove	2	1	-	-	-	-	1(1)	-	-	-	-	-	1(1)	2	4(1)
Gallus gallus, Domestic chicken	7	1	-	-	-	4(2)	1(1)	1(1)	1(1)	1(1)	39(2)	11(2)	43(5)	101	108(5)
Meleagris gallopavo, Domestic/wild turkey	1	1	-	-	1(1)	-	-	-	-	-	-	-	1(1)	2	3(1)
Colinus virginianus, Bobwhite quail	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
Hawk species	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
Anas spp., Domestic/wild duck	-	-	-	-	-	-	-	-	-	-	-	-	3(1)	3	3(1)
Anser spp., Domestic/wild goose	-	-	-	-	-	-	1(1)	-	-	-	-	-	-	1	1(1)
AMPHIBIA-AMPHIBIANS	-	-	-	-	-	-	-	-	-	-	-	1(1)	-	1	1(1)
Bufo/Rana spp., Toad/frog spp.	-	-	-	-	-	-	-	-	-	-	-	1(1)	-	1	1(1)
REPTILIA-REPTILIA	4	3	-	-	-	-	-	-	-	-	4(1)	-	-	4	8(3)
Chrysemys/Graptemys spp., Painted/Map turtle spp.	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
Terrapene carolina, Eastern box turtle	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2(1)
Chelydra serpentina, Snapping turtle	1(?)	1	-	-	-	-	-	-	-	-	4(1)	-	-	4	5(1)
PISCES-FISHES	3	2	-	-	-	-	-	-	-	-	1(1)	1(1)	-	2	5(4)
Aplodinotus grunniens, Freshwater drumfish	-	-	-	-	-	-	-	-	-	-	-	1(1)	-	1	1(1)
Centrarchidae, Bass family	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2(1)
Catostomidae, Sucker family	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
Lepisosteus spp., Garfish species	-	-	-	-	-	-	-	-	-	-	1(1)	-	-	1	1(1)
MOLLUSCA-MUSSELS/GASTROPODS	5	4	-	-	-	-	-	-	-	-	-	-	-	-	5(4)
Actinonaias carinata, Mucket	2	1	-	-	-	-	-	-	-	-	-	-	-	-	2(1)
Gonidbasis spp.	2	2	-	-	-	-	-	-	-	-	-	-	-	-	2(2)
***Pleurocera* spp., Periwinkle**	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1(1)
TOTAL NUMBER OF IDENTIFIED FRAGMENTS	905	-	1	1	20	9	71	9	2	1	358	43	120	653	1558(69)
INDETERMINATE	4844	-	13	-	101	16	192	9	2	108	837	157	164	1599	6443
Large mammal fragments	4699	-	13	-	97	12	132	8	2	107	692	138	113	1314	6013
Small mammal fragments	14	-	-	-	1	3	-	-	-	-	6	2	5	17	31
Bird fragments	78	-	-	-	3	1	59	1	-	1	132	13	39	249	327
Turtle fragments	3	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Amphibian fragments	-	-	-	-	-	-	-	-	-	-	-	-	1	1	3
Fish fragments	43	-	-	-	-	-	1	-	-	-	5	4	6	16	59
Terrestrial snail fragments	5	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Bivalve fragments	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Eggshell weights (grams)	123.6	-	-	0.1	-	-	-	-	-	-	2.5	1.2	7.7	11.5	134.6
Fish scale weights (grams)	11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	11.8
FRAGMENT TOTALS	5749	-	14	1	121	25	263	18	4	127	1195	200	284	2252	8001

* remains of two individuals () minimum number of individuals

turtle, snapping turtle, bass family, garfish family, and one species and two genera respectively for freshwater mussels and gastropods.

Accounts of Species

Pig

Representatives of all skeletal elements of the domestic pig appear in the subassemblage of faunal remains. The composition of the 546 pig remains consists of 64.0 percent craniofacial, mandibular, and dental fragments. Fourteen right mandibular canines recovered as isolated entities or appearing in situ represent a minimum of 14 individuals. Vertebra and rib fragments represent 2.6 percent of the remains. Forequarter portions of the scapula, humerus, ulna, radius, and carpus account for 10.3 percent of the remains, while hindquarter skeletal portions of the innominate bones, femur, tibia, fibula, and tarsus represent 11.4 percent. Miscellaneous metapodial and phalangeal remains of the third and fourth and second and fifth digits account for the remaining 11.6 percent of the pig remains.

The recovery of 19 left and right rami portions provide an opportunity to assess the age at which swine were slaughtered for domestic and resort consumption. Based on the sequence of dental development (Silver 1963:264-65), 16 mandibular portions represent animals that were slaughtered at 17 to 21 months of age, 2 were 12 to 16 months, and 1 was about 6 months of age. The general pattern of slaughter as reflected in the sample of pig remains indicates that the majority of pigs raised at the farm/resort were 18 to 19 months of age at the time of slaughter. This pattern of utilization corresponds to the age of slaughter reported by Towne and Wentworth (1950:128) during the American Colonial period and the age of slaughter of the animals determined by Breitburg (1976:262-63) for the Hermitage faunal remains, a nineteenth-century plantation site of similar socioeconomic and sociocultural standing.

The fortuitous presence of a nearly complete specimen of an immature pig recovered from the bottom of Feature 12 provides an ideal opportunity to establish the season of feature use. The specimen was discovered in an articulated state. There is no indication that the animal was killed for consumption and there is no evidence that the animal had been slaughtered. It is possible that in pursuing swine for slaughter this young individual may have been injured and eventually died or killed accidently. The sequence of dental development of the maxillary and mandibular dentition suggests the individual was from 4 to 6 months of age at the time of death.

Bailey (1906:605) indicates that if sows are to produce a single litter per year, they should give birth around the first of March; when two litters are to be produced, the second litter should appear around early September. If the individual in question was born around the beginning of March, it may have died between June and August. If the individual was born in the early part of September, a December to February date is indicated. Smith's analysis of the ceramic wares associated with the feature indicates the feature could have been in use in 1839. Archival evidence reported by Smith suggests that

resort activity reached its zenith around this time. If this is true and most resort activity occurred during the warmer months of the year, then the pig may have died between June and August 1839. Therefore, based on this single piece of evidence, the cultural debris associated with Feature 12 may have been deposited during the summer of 1839.

Only a limited number (N=24) of pig skeletal fragments exhibit butchering marks. Axes were employed to treat the head, vertebral column, humerus, innominate bones, femur, and tibia, while knives were employed to remove flesh or dismember aspects of limbs in the region of the elbow, hip, and thigh. The slaughter of 14 individuals, yielding an average of 140 pounds of usable meat, could yield a total of 1,960 pounds of meat for domestic and resort consumption.

Cow

Domestic cow remains (N=253) associated with Feature 12 consist of craniofacial, mandibular, and dental fragments (14 specimens or 16.7 percent). Vertebral and rib portions represent 13.1 percent and 23 percent respectively of the cow remains. While forequarter specimens represent 21.4 percent (54 specimens), hindquarter skeletal portions represent 17.9 percent (45 specimens). Based on the recovery of 5 right proximal or 5 left innominate bones, a minimum of 5 individuals is represented by the remains. Three recovered rami portions indicate that cattle were slaughtered at 1½ to 2½ years of age.

Saws, axes, and knives were employed to treat the carcasses of cattle during butchering procedures. At least 46 specimens bear butchering marks. Saws were employed to remove horn cores, to separate the hindquarter at the hip, to remove the distal aspect of the femur, and to remove the foot from the lower leg at the ankle. Axes were employed in the gross treatment and dismemberment of the carcass. Ax cuts were inflicted along the longitudinal axes of cervical, lumbar, and sacral elements to split the carcass in half, and used to separate the thoracic vertebra from rib shafts, and to separate portions of the shoulder, upper arm, and lower arm. Axes were employed to separate the hindquarter at the hip, along the thigh, and lower leg. Knife cuts appear on a specimen of frontal bone, suggesting possible hide-removal procedures. Knives were employed also to treat aspects of the metacarpal, hip, and toes. It is estimated that the five cows may have yielded a total of 2,500 pounds of meat for consumption.

Other Species Associated with Feature 12

The preponderance of cattle and pig remains recovered from Feature 12 suggests that a very large quantity of meat was processed and consumed in a very short period of time. The quantity of remains representing these species suggests that the pit was excavated primarily to accommodate the remains of large animals or it was excavated to accommodate both spent animal remains and other cultural refuse to be produced by the large influx of resort guests in 1839. A little more than 88 percent of the identified material was composed of cattle and pig remains. The remaining 12 percent of the faunal remains is

distributed among the remains of domestic sheep, white-tailed deer, mole, cat, raccoon, squirrel, rabbit, dove, chicken, domestic or wild turkey, quail, hawk species, pond terrapin, bass and sucker species, and freshwater mussels and gastropods. Of these species, domestic sheep (42 specimens) were the most significant edible species. Based on the recovery of a similar number of left scapula portions, a minimum of 4 individuals is represented. Of the three recovered sheep rami, two were 9 to 12 months at the time of slaughter, and one was approximately 18 to 24 months. Assuming that an average individual yielded about 40 pounds of usable meat, a total of 160 pounds of usable meat is represented by sheep remains. Based on the species composition of the recovered remains, the dietary composition (Table 2) of the occupants contributing to the deposit is suggested to be the following: 52.7 percent beef, 41.3 percent pork, 3.4 percent mutton, 1.3 percent venison, and 1.2 percent small mammal (raccoon, squirrel, rabbit, and opossum), bird (chicken, turkey, crow, dove and quail), turtle, and fish.

FAUNAL REMAINS RECOVERED DURING THE 1975 EXCAVATION

In 1975 a total of 2,252 skeletal fragments was recovered from Wynnewood (Smith 1975; Breitburg 1983a). The material was recovered from ten different areas (Table 1). Over 60 percent of the material was associated with two slave cabins and the remaining material was recovered from the Spencer Tree site, the main house, the school site, doctor's house, smokehouse, backyard, and guest cottages. The species associated with these areas and not identified in the 1981 Feature 12 sample were domestic dog, wild or domestic goose and duck, frog or toad species, and drum and gar fish species. With the addition of the Feature 12 remains, a total of 8,001 specimens have been recovered from the site to date. The reassessment of all edible vertebrate species associated with the Wynnewood site demonstrates little change in the overall dietary composition of the inhabitants. Beef and pork continue to be the major constituents of the diet, contributing 54.2 and 40.5 percent of the meat respectively to the diet. The use of mutton accounts for 3.4 percent, while edible large and small game mammals, birds, turtles, and fish account for a little more than 2 percent of the diet.

DISCUSSION

One of the major goals of conducting historic site archaeological research in Tennessee's Central Basin, as outlined by Smith (1976:4-6), is to establish a model of regional cultural behavior. Only in the past decade has an effort been made to alleviate the pressing need for data accounting for the nature of settlement and its ramifications (e.g., Stripling 1980). In addition to the effort of reconstructing this regional historic period site universe through the study of the material remains recovered during archaeological investigations, the use of ethnohistoric methods is playing an increasing role in defining this universe (Spores 1980). While some archaeologists (e.g., South 1974:155) deride the utility of research designs which combine archaeological and ethnohistoric methodologies as a superimposition of historical data onto archaeological data, others (e.g., Noel Hume 1975) have emphasized the critical interrelationship of archaeological and documentary sources of evidence in research designs. Many

Table 2. Number of fragments, MNI, and dietary ratios for edible species.

Taxa	Totals	Feature 12					Site Subassemblage				
		No. of Fragments	MNI	Meat* Yield	% Class/Phylum	Total %	No. of Fragments	MNI	Meat* Yield	% Class/Phylum	Total %
	880	44	4740.4	--	100.0	1409	57	5535.2	--	100.0
Mammals	855	30	4710.1	100.0	99.4	1269	35	5493.0	100.0	99.2
Ovis aries, Domestic sheep	42	4	160.0	3.4	3.4	57	4	160.0	2.9	2.9
Bos taurus, Domestic cow	253	5	2500.0	**53.1**	52.7	283	6	3000.0	54.6	54.2
Odocoileus virginianus, Deer	1	1	62.5	**1.3**	1.3	1	1	62.5	1.1	1.1
Sus scrofa, Domestic pig	546	14	1960.0	**41.6**	41.3	869	16	2239.9	40.8	40.5
Procyon lotor, Raccoon	2	1				2	1			
Sciurus carolinensis, Gray squirrel	3	2	27.6	0.6	0.6	26	3	30.6	0.6	0.6
Sylvilagus floridanus, Rabbit	4	1				27	2			
Didelphis marsupialis, Opossum	4	2				4	2			
Birds	13	5	16.0	--	0.3	122	11	25.7	--	0.5
Corvus brachyrhynchos, Crow	2	1				2	1			
Zenaidura macroura, Mourning dove	2	1				4	1			
Gallus gallus, Domestic Chicken	7	1	16.0			108	5	25.7		
Meleagris gallopavo, Turkey	1	1				3	1			0.5
Colinus virginianus, Bobwhite	1	1				1	1			
Anas spp., Domestic/wild duck	-	-				3	1			
Anser spp., Domestic/wild goose	-	-				1	1			
Reptiles	4	3	12.1	--	0.3	8	3	12.1	--	0.2
Chrysemys/Graptemys spp., Painted/map turtle spp.	1	1	12.1			1	1	12.1		
Terrapene carolina, Box turtle	2	1				2	1			0.2
Chelydra serpentina, Snapping turtle	1(?)	1				5	1			
Fishes	3	2	2.2	--	Trace	5	4	4.4	--	0.1
Aplodinotus grunniens, Drumfish	-	-				1	1	4.4		
Centrarchidae, Bass family	2	1	2.2			2	1			0.1
Catostomidae, Sucker family	1	1				1	1			
Lepisosteus spp., Garfish spp.	-	-				1	1			
Mollusk	5	4	Trace	Trace	Trace	5	4	Trace	Trace	Trace
Actinonaias carinata, Mucket	2	1				2	1			
Corbicula spp.	2	2	Trace	Trace		2	2	Trace		
Planorbella spp., Periwinkle	1	1				1	1			Trace

* pounds of usable meat
MNI minimum number of individuals

archaeologists and ethnohistorians (cf. Spores 1980:579) have stressed that archaeological and documentary evidence are both convergent and parallel sets of data. When these two sets of data are combined, they provide a much clearer view of a particular cultural pattern. These sets of data may be employed as independent or parallel sets of evidence to test hypotheses or used as complementary measures of reliability.

One of the major problems facing the zooarchaeologists who analyze remains from historic sites today is the reliability that may be attached to the results of an analysis. Presently, investigators may identify a sample, determine the minimum number of individuals, provide dietary ratios, discuss status-related animal utilization, and discuss the exploitative capability of site occupants. The question arises: how do we know that the methods employed by investigators give a reliable assessment of the data? What guideline or framework is available to the investigator to affirm the data as spurious or reliable? Historic site zooarchaeologists have a body of comparable data in the form of U. S. Census Schedules (Productions of Agriculture) at their disposal. Through these census schedules it is possible to establish a parallel set of data that may be used as a guideline of realibility when compared to archaeological data. The census schedules list, among many other categories, the number of cattle, swine, and sheep associated with a particular farm or plantation operation. These animals consistently make up the largest category of animals recovered from historic site archaeological deposits in Middle Tennessee.

After completing the analysis of the Wynnewood material, this investigator prepared an archaeological set of data and a set of data prepared from the 1850 and 1860 U. S. Census Schedule 4, Productions of Agriculture (Table 3). The set of archaeological data was first assessed for Feature 12 and the total site sample represented thus far at Wynnewood. The table lists the represented minimum number of individuals (MNI) for domestic cow, pig, and sheep, the percent of MNI, the estimated meat yield, and percent of usable meat represented by the animals. These same procedures were employed to evaluate the information presented in the census schedule for the years 1850 and 1860. Meat yield estimates appearing in the set of documentary evidence represent the potential available meat at the farm and are standardized for age and potential usable meat.

The results of the computations produce some rather remarkable results. Of the 23 identified individuals present in Feature 12, approximately 22 percent represent cow, 61 percent pig, and 17 percent sheep. There are no significant differences in the composition of these species when the total subassemblage is evaluated. Cow accounts for 23 percent of the individuals and pig and sheep account for 62 percent and 15 percent respectively. Of the total 4,620 pounds of usable meat represented by the species in Feature 12 (ca. 1840) deposits, 54 percent represents beef, 42 percent pork, and 3.5 percent mutton. There are no significant differences when the complete subassemblage is examined. Beef represents 56 percent, pork 41.4 percent, and mutton 3 percent. In comparison, the census schedule for 1850 lists a total of 250 animals: 40 cows, 150 pigs, and 60 sheep. There are no significant differences in the percentage composition of animals determined to be

Table 3. Comparisons of archaeologically derived statistics to 1850 and 1860 census schedule statistics.

	Archaeological Data							
	Feature 12 (ca. 1840)				Total Sample			
Species	MNI	%	Meat Yield	%	MNI	%	Meat Yield	%
Domestic cow	5	21.7	2500.0	54.1	6	23.1	3000.0	55.6
Domestic pig	14	60.9	1960.0	42.4	16	61.5	2240.0	41.4
Domestic sheep	4	17.4	160.0	3.5	4	15.4	160.0	3.0
Totals	23	100.0	4620.0	100.0	26	100.0	5400.0	100.0

	U.S. Census Schedule 4*							
	1850				1860			
Species	No.	%	Meat Yield	%	No.	%	Meat Yield	%
Domestic cow	40	16.0	20,000.0	46.0	30	20.0	15,000.0	55.4
Domestic pig	150	60.0	21,000.0	48.4	75	51.0	10,500.0	38.7
Domestic sheep	60	24.0	2,400.0	5.5	40	29.0	1,600.0	5.9
Totals	250	100.0	43,400.0	99.9	145	100.0	27,100.0	100.0

* Productions of Agriculture

represented for Feature 12 (ca. 1840), the total sample, or the 1850 census: cattle account for 16 percent of the individuals, swine 60 percent, and sheep 24 percent. The estimated meat potential represented by the 1850 census is 43,400 pounds. Beef accounts for 46 percent of the available meat, pork, 48.4 percent, and mutton, 5.5 percent. There are no significant differences in the proportional amounts of meat represented in Feature 12, the total sample, and the 1850 census. For the year 1860 there is a decrease in cattle, swine and sheep production. This decrease appears to be correlated with a decline in corn and swine production which may be related to the decline in the slave population and reduced resort activity for the decade after 1850. It should be noted, however, that although there is a dramatic decrease in the number of individuals (N=145) the estimated meat yield is surprisingly similar to the meat yield identified archaeologically. It appears that production was reduced proportionately to what was available in 1850.

There are several conclusions that may be drawn from these comparisons. First, such close proportional representation of individuals and potential meat yields that were derived from the archaeological data and census schedule cannot be attributed to spurious correlation, statistically there are no significant differences between the two sets of data. Secondly, the guidelines or framework set by the census data suggest that the methods employed to evaluate the archaeological data are probably adequate enough to assign a high degree of reliability and confidence to the analysis of the site fauna. Third, the results appear to verify the patterned nature of the archaeological record and suggest that it is possible to replicate, with some limitations, a given subsistence pattern from archaeological data for such sites. If the foregoing statements are true, it must be emphasized that the Wynnewood utilization of domestic animals was in proportion to their production. Likewise, if this is the case, we have defined an example of patterned behavior in the archaeological record and verified it through an independent source (i.e., census schedules). It should be noted, however, that many more species were utilized at the site, and outside of the archaeological record, we have no way to account for the importance of other species that were used at Wynnewood.

One of the problems that arises from the preceding assessment of the Wynnewood faunal remains is the need for other sets of archaeological and documentary evidence that will corroborate such findings and assumptions. This investigator has had the opportunity to examine faunal remains recovered from the Hermitage Mansion (Breitburg 1977), from the Belle Meade Plantation (Breitburg 1982), and from the Woodlawn Plantation (Breitburg 1983b). All of these plantations are located in the Central Basin and were of somewhat similar socioeconomic and sociocultural standing. Table 4 presents the dietary composition of the archaeological material recovered from these sites. An independent set of data was obtained by using the 1850 census schedules for products of agriculture to determine the number and potential meat available for cow, pig, and sheep.

Again some rather remarkable results were produced from the data. At the Hermitage Mansion and Woodlawn Plantation the composition of represented individuals in archaeological deposits for pig, cow, and sheep is nearly equal

Table. 4. Comparative statistics for four Middle Tennessee plantation sites.

Taxon	Wynnewood Archaeological Data (ca. 1840) % MNI	Wynnewood % Meat Yield *	Hermitage [1] Archaeological Data (1820-1840) % MNI	Hermitage % Meat Yield	Belle Meade [2] Archaeological Data (ca. 1847) % MNI	Belle Meade % Meat Yield	Woodlawn [3] Archaeological Data (1820-1900) % MNI	Woodlawn % Meat Yield
Domestic pig	61.5	41.3	71.4	51.7	87.5	75.3	75.0	56.8
Domestic cow	23.1	52.7	14.2	34.6	6.3	19.2	12.5	34.6
Domestic sheep	15.4	3.4	14.2	3.0	6.3	1.5	12.5	3.0
Deer	-	1.3	-	-	-	-	-	-
Small mammal	-	0.6	-	3.0	-	2.2	-	2.0
Birds	-	0.3	-	6.2	-	1.0	-	2.6
Turtles	-	0.3	-	1.1	-	0.4	-	0.6
Fish	-	Trace	-	1.0	-	0.4	-	0.4
Mollusk	-	Trace	-	Trace	-	Trace	-	Trace
	N=26	N=4740.4	N=14	N=2705.8	N=16	N=2605.4	N=8	N=1303.8
	Census Data (1850) % No.	Census Data (1850) % Meat Yield	Census Data (1850) % No.	Census Data (1850) % Meat Yield	Census Data (1850) % No.	Census Data (1850) % Meat Yield	Census Data (1850) % No.	Census Data (1850) % Meat Yield
Domestic pig	60.0	48.4	63.0	50.3	58.6	62.2	60.0	68.3
Domestic cow	16.0	46.0	15.8	44.9	7.2	27.4	5.0	20.3
Domestic sheep	24.0	5.5	21.1	4.8	34.2	10.4	35.0	11.4
Deer	-	-	-	-	-	-	-	-
Small mammal	-	-	-	-	-	-	-	-
Birds	-	-	-	-	-	-	-	-
Turtles	-	-	-	-	-	-	-	-
Fish	-	-	-	-	-	-	-	-
Mollusk	-	-	-	-	-	-	-	-
	N=250	N=43400.0	N=475	N=83500.0	N=555	N=73100.0	N=1000	N=123000.0

1 Breitburg 1977: 101
2 Breitburg 1982: 116
3 Breitburg 1983b: 12-13

* pounds of meat

for these species. While 71.4 percent of the individuals represent pigs and 14.2 percent of the individuals are composed of cows and sheep each, the composition of individuals represented at Woodlawn deposits was very similar (75.0 percent pig, 12.5 percent for cow and sheep each). Although the Belle Meade material exhibited a higher portion of pigs (ca. 88 percent), cow and sheep were equally represented (6.3 percent each). Meat yielded ratios for pig, cow, and sheep at the Hermitage and Woodlawn were remarkably similar also. At the Hermitage 51.7 percent, 34.6 percent, and 3.0 percent of the meat was distributed among pig, cow, and sheep respectively. Somewhat similar dietary ratios were computed for the use of small mammals, birds, turtles, and fish. At Belle Meade the values do differ, but the order of importance of the animals still remain the same (pig 75.3 percent, cow 19.2 percent, and sheep 1.5 percent). This difference may be attributed to the rather small sample (1,544 specimens) of animal remains recovered from the site.

The documentary evidence assessed from the 1850 census do show some similarities as well as some differences in the archaeologically derived data and census schedules. At the Hermitage both the archaeological and documented percents of individuals and potential meat yield are indeed similar. The census data also exhibit nearly equal representation of individuals and meat yield potential at Wynnewood and the Hermitage, while the composition of individuals and potential meat yield are very similar to that found at Belle Meade and Woodlawn. One of the main differences found was the high consumption of beef represented in the archaeological deposits at Wynnewood. The unusually high proportion of beef (52.7 percent) consumption and reduced pork consumption (41.3 percent) identified for Wynnewood departs from the utilization of the species at the Hermitage, Belle Meade, and Woodlawn where the order of importance was pig, cow, and sheep. The inverse importance of beef and pork at Wynnewood may be one of the main differences that sets Wynnewood as a farm/resort operation apart from the Hermitage, Belle Meade, and Woodlawn where agricultural production was the main activity. With some of the reservations and exceptions outlined above, the data seem to support the notion that the number of individuals and represented meat potential in archaeological deposits and that identified from documentary sources are closely aligned.

The relatively high values of pork utilization at these sites are probably intricately related to the slave populations associated with these plantations. It has been suggested (Breitburg 1976:262-63, 265) that from the standpoint of the short gestation period, the number of offspring produced, the pounds of feed required to gain one pound, the percent of energy stored of the food consumed, the minimum age of slaughter, percentage yield of usable meat, and the caloric value of the meat and other by-products, pigs, as a food reservior of meat for farm consumption, are far more desirable than cattle, which are costly to raise and maintain, and sheep, which are more valuable for wool production than for consumption purposes alone.

The slave populations at the Hermitage (N=137), Belle Meade (N=93), and Woodlawn (N=111) numbered about one hundred individuals each around 1850 and at the Wynnewood site 15 individuals. Feeding all these people required the production of a staple meat which could be produced quickly and yielded a

large quantity of meat with a minimum input of time and money. Apparently at these plantation sites swine met all of these criteria and often accounted for the greatest number of the animals raised. For the year 1850 the Hermitage, Belle Meade, Woodlawn, and Wynnewood, according to the U.S. Census Schedules, Productions of Agriculture, listed 300, 325, 600, and 150 swine respectively as part of their farm inventory. It is known from documentary sources (Bassett 1931:64; Breitburg 1976:262) that the swine raised at the Hermitage were raised for farm use.

For the year 1829 Jackson listed in his farm journal a total of nearly 19,000 pounds of pork in storage at the Hermitage. It is estimated (Breitburg 1976:263) that as much as 65 percent of this meat was to be distributed among his slaves. While the 150 pigs listed for 1850 at Wynnewood appear to be raised in proportion to the number of slaves (N=15 for 1850) residing at this small plantation and probably for resort consumption, the 600 pigs raised at Woodlawn appears disproportionate to the number of slaves (N=111) living on the property. It is assumed that the close proximity of Nashville's urban markets may explain this high number of swine raised at Woodlawn and part of the excess, after plantation needs were allowed, were sold. Based on the census data of 1850 and 1860, there is a dramatic drop in the number of swine produced at these plantations as well as a decline in the number of slaves and the production of corn. These census data appear to support the notion that the number of slaves residing at respective plantations, the number of swine produced, and the production of corn were dependent variables: where there was a reduction in slave holdings, there was also a concomitant reduction in swine and corn production.

At least two points must be kept in mind when considering the above assumptions. First, pork was a favored food in the southern cuisine. Pork was raised for the consumption purposes of slave-owners as well as their slaves. Second, at Wynnewood beef consumption exceeded pork consumption. As mentioned earlier, this appears to be one of the crucial factors that sets Wynnewood as a resort/farm operation apart from the other plantations where agricultural production was the primary activity. How true this latter observation is depends on obtaining additional information from other resort/farm operations similar to Wynnewood.

Another point of discussion deals with the utilization of sheep at these sites. There is remarkable similarity in mutton utilization. With the exception of the Belle Meade site where the use of mutton in the diet was estimated to be 1.5 percent (as mentioned earlier this may be due to sample size), the use of mutton at the Hermitage, Wynnewood, and Woodlawn accounted for approximately 3.0 percent of the overall dietary regimen. Producing such a consistent value of consumption for sheep cannot be explained as coincidence or accident, it may relate to some type of "reality" represented in the archaeological record. Zooarchaeologists do not have control over what comes out of the ground at a site, they may only employ the methods at their disposal, applied in a consistent manner, to analyze and explain the nature of a particular set of data. The low value of sheep utilization may be explained not only in terms of the commercial value of wool production, but also as a southern dietary pattern that has been suggested to be rooted in the general

dislike of the meat (Boss 1906:14; Bailey 1908:252; Bidwell and Falconer 1925:111; Carrier 1923:257-258; and Gray 1933). It can be established with certainty, as the above investigators have stressed, that mutton was not palatable to early Americans of the northern and southern latitudes because of the slow and unskillful preparation of dressing the carcass and its preparation under unsanitary conditions. Archaeologically (e.g., Breitburg 1977 and 1983c:120) a low value of sheep utilization may be documented for mid-eighteenth-century military forts and domestic sites.

The final point of discussion is the importance of beef to the plantation system as it is reflected in the data presented here. Beef consumption accounts for a rather important source of meat to the diet and, in some cases, is nearly equal to pork consumption. At Wynnewood beef consumption exceeds pork consumption, the difference may be attributed to the activity of catering to an elite clientele of the resort who could afford the cost of time-intensive, high-cost cattle. Interestingly, the faunal remains associated with the slave cabins indicates dietary ratios of 61 percent, 34.4 percent, and 4.8 percent cow, pig, and sheep respectively. These slave-associated deposits show a proportional relationship of consumption as is indicated for Feature 12 (documented to be of resort-related discard flow): 53, 41, and about 3 percent respectively for cow, pig, and sheep. In contrast, at the Hermitage pork, beef, and sheep consumption was estimated to be 41, 35, and 3 percent respectively in Mansion-associated deposits, while at two brick cabins (Breitburg 1977:101, 105) that may have housed slaves are remarkably similar (49, 41, and 3 percent for cow, pig, and sheep respectively.) These data may suggest that both owner and slave are eating in proportion to what is being raised on the farm and incorporating in their diets equitable portions of beef, pork, and mutton.

Based on these findings, any model that is to be developed for Tennessee's Central Basin plantation utilization of domestic mammals must be one that includes a pork/beef/sheep dietary regimen at large plantation sites where there will probably be equitable utilization of pork, beef, and mutton by both owner and slave. At farm/resort operations such as Wynnewood (there were at least 31 water spa resorts, including Wynnewood, in Middle Tennessee, Thorne 1971:321-359) the pattern of animal utilization will be one that includes a beef/pork/mutton dietary regimen with equitable consumption patterns for these species between the elite clientele, owner, and slave.

CONCLUSIONS

The analysis of faunal remains associated with Wynnewood State Historic Site, Sumner County, Tennessee, focused on the examination of 5,749 specimens recovered in 1981 and the 2,252 specimens recovered in 1975. The material indicated that the order of importance of utilized domestic mammals was cow, pig, and sheep. Other domestic species (e.g., chicken, probably turkey), large game mammals (deer), and aquatic species (e.g., turtles, fish) were minor constituents in the diet. Based on the recovery of an articulated pig from the bottom of Feature 12 and in conjunction with the mean ceramic date of Feature 12 use, it was determined that the contents of the feature were deposited probably in the summer of 1839. The analysis of the archaeological

remains indicated that the dietary composition and the proportional representation of individuals for cow, pig, and sheep was similar to the percentage composition of the number of available individuals and the percentage composition for the potential available meat reserve determined from the U.S. Census Schedules, Productions of Agriculture. The analysis of the Wynnewood remains suggested that a high degree of confidence and reliability could be assigned to the methods employed to assess the material. When similar methods were employed to assess three other mid-nineteenth-century plantations sites (the Hermitage, Belle Meade, and Woodlawn) of similar socioeconomic and sociocultural standing, the investigator was able to verify and replicate the results of the Wynnewood data analysis. It was determined that there was a high degree of continuity in the utilization of domestic animals as it was represented in the archival documents and what was found in the archaeological deposits. Continuity in the proportional representation of potential meat yield was reflected in deposits produced by plantation owners, upper-class resort guests, and probably slaves.

On the basis of the data analysis, a model of large to small plantation domestic mammal utilization for Middle Tennessee sites can be proposed. The model of Middle Tennessee plantation site domestic mammal utilization, as proposed here, is predicated on a slave holding of approximately 90 or so individuals and a potential meat reservior of about 565 animals consisting of 340 pigs (60.3 percent of the individuals), 50 cows (9.0 percent), and 175 sheep (30.9 percent) with a meat production capability of 80,000 pounds of meat, roughly composed of 60.0 percent pork, 31.0 percent beef, and 9.0 percent mutton. The archaeological data gathered from similar sites should demonstrate similar or proportional representation for the composition of individuals and composition of dietary ratios. It should be emphasized at this point that the analysis is restricted to the observations of the proportional representation of individuals and dietary composition. The quality and variety of the utilized meat may vary considerably between owner-associated and slave-associated deposits. Such an appraisal is beyond the scope of this analysis, but future research designs will consider such status-associated issues.

In conclusion, the data analysis suggests that those pursuing the implications of faunal remains associated with historic sites should combine ethnohistoric and archaeological methodologies to fully account for the nature of archaeological site faunal associations. The combination of these two approaches to data analysis provide a measure of reliability, rigidity, and integrity that cannot be achieved by the use of archaeological data alone. Furthermore, the results of the analysis suggest that the evaluation of a given subsistence pattern using the methods of White (1953) may be a very effective tool to generate a set of archaeological data. This, of course, is predicated on the use of a uniform set of values for live weights and usable meat weights with reference to the context of specific cultural, temporal, and spatial considerations. It is proposed that investigators of the patterned nature of cultural behavior not view the use of historic documentation as a "superimposition" of documentary data on archaeological data, as a "crutch," or as a simple means of filling in the "gaps" of history, but rather look at

the use of documentary evidence as a guide of reliability in assessing the universal patterns of human behavior as represented in historic site deposits. Finally, it must be emphasized that the findings of this analysis have yet to be tested, replicated, and verified in the broader context of zooarchaeological analysis of other similar historic period sites. Only continued replication and verification of the results in the context of a more comprehensive sample of sites can verify the results presented herein. If these findings can be supported, then historic site archaeologists can better fulfill the expectations and demands of anthropological research designs and goals.

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