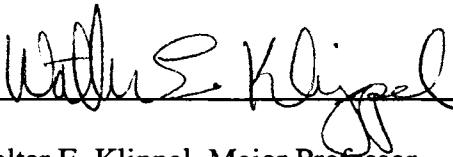
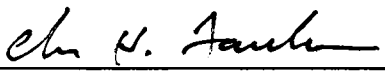


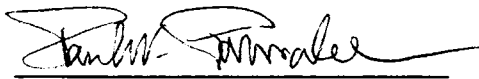
To the Graduate Council:

I am submitting herewith a thesis written by Judith A. Patterson entitled "Dietary Patterning at an Upland South Plantation: The Ramsey House Site (40KN120), Knox County, Tennessee." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment for the degree of Master of Arts, with a major in Anthropology.


Walter E. Klippel, Major Professor

We have read this thesis and
recommend its acceptance:





Accepted for the Council:



Associate Vice Chancellor

And Dean of the Graduate School

DIETARY PATTERNING AT AN UPLAND SOUTH PLANTATION:
THE RAMSEY HOUSE SITE (40KN120), KNOX COUNTY, TENNESSEE

A Thesis

Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Judith A. Patterson

August 1998

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DEDICATION

This thesis is dedicated to the memory

of my mom, Marty Brashears.

She taught me it was okay to be a thinker,

rather than a do-er.

ACKNOWLEDGMENTS

There are many individuals who made the process of writing this thesis easier to handle. First and foremost I must thank the members of my committee, Drs. Walter E. Klippel, Charles H. Faulkner, and Paul W. Parmalee, for their never-ending patience and guidance during the past couple of rough years. Dr. Klippel's gentle and subtle inquiries about my progress urged me on to finally get my thesis finished. I also would like to thank Dr. Faulkner for first introducing me to historic archaeology years ago and for allowing me to analyze the Ramsey House faunal remains. Dr. Parmalee's forays to the Anthropology Department often included a query as to when the thesis would be done. Again, thank you for the prodding. Mr. Steve Helms of Helms Slaughtering Company in Maynardville, Tennessee, provided the cattle elements needed for the allometric research.

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And finally, a very special thank-you to J.S.

ABSTRACT

The faunal remains recovered from excavations at the historic Ramsey House (40KN120), located in Knox County, Tennessee, provide an opportunity to examine dietary preferences on an Upland South Plantation. The analysis has shown that domestic mammals, primarily pigs and cattle, were the main sources of the meat diet. All portions of the hog carcass were utilized and a home production and consumption model was followed. Cattle were most likely raised on the farm, however, the presence of sawn bone in early contexts may indicate the services of a professional butcher were utilized.

The material was compared to other historic faunal assemblages in Tennessee and a pattern of heavy reliance on terrestrial mammals, mainly pigs and cattle, was revealed. An analysis of the preferred butchery technology on each site shows chopping was the primary method utilized until 1850, which then gave way to sawing. However, in the eastern Tennessee sites, sawing was used in early contexts, indicating some influence of the market system of early Knoxville.

Metrical analysis of the Ramsey House faunal assemblage has provided estimates of the biomass available as indicated from recovered cattle phalanges. Further, research has shown that it is possible to metrically determine the sex and the front or hind position of phalanges.

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Chapter 1

Introduction

Historic zooarchaeology in the Southeast has focused on coastal plain sites (Jolley 1983; Reitz and Honerkamp 1983; Reitz and Scarry 1985; Reitz 1992). Comparatively fewer excavations have taken place in the interior areas of the South. A particular emphasis on Upland South historic sites has occurred in eastern Tennessee (Parmalee 1973; Polhemus 1977; Breitburg 1983; Faulkner 1988, 1989, 1991; Andrews and Young 1992; Young 1993; Lev-Tov 1994). The Ramsey House Site is an Upland South Plantation occupied from the late eighteenth century to the mid-twentieth century. The inclusion of this faunal analysis will add to the database of Upland South historic lifeways and provide a unique picture of an upper status family and their dietary practices in the frontier era of Knoxville, Tennessee.

Excavations at the historic Ramsey House provided faunal materials needed to examine dietary content of the occupants at a relatively small plantation. Questions about the assemblage include whether a high reliance on wild species occurred due to the frontier period of the first occupation. Also, as the farm moves out of the Ramsey family,

are more wild taxa utilized due to a lower economic base? What are the primary sources of meat in the diet and can the butchery practices and waste tell us what type of production was occurring on the farm through time?

The faunal data from the Ramsey Site near Knoxville, Tennessee, are compared to other Upland South assemblages in East Tennessee, as well as materials from sites in Middle Tennessee. Species utilization and butchering technology will be investigated for evidence of a distinctive Upland South pattern. The comparative materials used to characterize historic foodways in East Tennessee include: the Gibbs Site (Lev-Tov 1994), Mabry Plantation (Young 1993), and Blount Mansion (Coxe 1998), all in Knox County, Tennessee; Fort Southwest Point in Roane County, Tennessee (Bunch 1993); and Fort Loudon in Monroe County, Tennessee (Parmalee 1960; Breitburg 1983b). Sites from Middle Tennessee include Wynnewood State Historic Site in Sumner County, Tennessee (Breitburg 1983a); the Gowen Farmstead (Breitburg 1993) and the Drennon Site (Patterson 1997) both located in Davidson County, Tennessee; and Westview Plantation in Williamson County, Tennessee (Patterson 1998).

Chapter 1 contains a review of historical zooarchaeology and Southern foodways. What topics have been explored by zooarchaeologists and do their faunal assemblages help to answer these questions? Does the faunal information correlate with the available historical documentary data?

Southern diets are looked at first from a historic viewpoint. What are the preferences and peculiarities of Southern foodways? What are the main sources of meat and how were they processed, divided, and cured? Does the zooarchaeological evidence support the historical impressions of Southern preferences for particular meats? What types of butchering practices were utilized? Additionally, how much of an impact do wild taxa have on the diet? This documentary evidence provides a framework for the analysis of the Ramsey House faunal material, something to which general comparisons can be made regarding the assemblage.

The Methods, Materials, and Goals chapter provides background information on the Ramsey House site history and details the archaeological investigations and methods of faunal analysis utilized with the assemblage. The goals for the analysis are discussed here as well. The site history is presented first, focusing on the various occupational episodes. The methodological section provides information on previous archaeological work at the site. Methods employed in the identification and analysis of the faunal assemblage are presented here. Quantification methods such as NISP, MNI, and biomass estimation are discussed. Finally, general goals of the analysis are delineated.

The faunal assemblage from the Ramsey House is dealt with in Chapter 4. General species utilization is discussed, followed by a finer scale analysis by period. Five periods: 1793 to 1820, 1820 to 1864, 1864 to 1910, 1910 to 1950, and 1950 to the

present, all correspond to different, known occupants at the plantation. The first period deals with Francis A. Ramsey's initial settlement of the plantation in the frontier era. The next period contained the largest quantity of faunal remains and is characterized by the occupation of Ramsey's heirs on the plantation. The third period represents the farm being sold out of the Ramsey family and then being bought and sold several times to various people through time. During the early twentieth century occupation of the farm, the fourth period, activities on the farm were carried out by tenants. The final period is characterized by the house and acreage being returned to a recognized historic site. Another section deals with excavations conducted in 1994, where occupational episodes could not be delineated. In each of these 'period' sections, species utilization and composition are determined. The relative importance of particular taxa within each period is discussed also. A discussion of butchery patterns and technology, meat cut usage, and aging data for pigs and cattle follows the general faunal description for the periods.

The Ramsey faunal assemblage is compared to other historic sites in Tennessee in Chapter 5. By looking at dietary composition and butchery patterning, an Upland South pattern is delineated.

Chapter 6 presents biometrical analysis for the Ramsey materials. Regression equations and statistics are presented on original research and how these methods can be

used in interpreting historic faunal assemblages containing cattle elements. Multivariate techniques are used to discriminate between front and hind phalanges and between sexes of cattle based on selected elements.

The final chapter is a summary of the information presented on the Ramsey assemblage. A glimpse of the dietary practices at the Ramsey House over a period of approximately 150 years is characterized and the results put into the context of the Upland South.

Chapter 2

Historic Zooarchaeology and Historic Southern Foodways

Historic Zooarchaeology

The application of zooarchaeological techniques to North American historic sites archaeology is fairly recent (Parmalee 1960). The early focus was primarily on the colonial dietary adaptations to a new environment on the coastal plains of the Atlantic and the Gulf coasts. Early accounts were descriptive and species lists were often relegated to the backs of reports as appendices. The issues dealt with were few, as the reports were mainly concerned with hunting patterns and butchery practices (Jolley 1983).

In the 1970s, faunal analyses were often integrated into the main body of archaeological reports. Analyses focusing on site seasonality and subsistence practices were often used to explain site occupation. Jolley (1983) suggests this change was directly related to a theoretical emphasis in archaeology proposed by advocates of the 'New Archaeology'. Issues beyond basic quantification were now being addressed.

Zooarchaeologists are also drawn to historic site analysis because of the availability of historic documents. These documents and histories serve as another source

to support dietary patterns observed in the (zoo)archaeological record . Most historic records were written by and about people of higher status. This emphasis can present a biased picture of past human activity on an historic site. For example, on a Southern plantation the planter would have kept records and written about life from the planter's perspective, not from the slaves' point of view. Faunal data can be used to compare the dietary patterns of the two groups to see if written records support hypotheses about differential access to food resources or perhaps indicate a totally different situation.

Butchery and Socioeconomic Status

Indicators commonly used by zooarchaeologists to assess socioeconomic status include: the quality of the meat cuts consumed, the diversity in the number of species consumed, and how much of these different species were consumed (Reitz 1987; Crabtree 1990). The quality of meat cuts is further defined by assigning a relative price or economic ranking to specific cuts indicating their desirability (Shulz 1979; Gust 1983). These indicators are measured by looking at differences in which parts or elements are represented.

An example is the work undertaken by Crader (1984) at Jefferson's plantation, Monticello. The faunal remains from two contexts were examined. The first was from a

storehouse where refuse from the slave quarters was deposited. A dry well that contained household kitchen refuse from the main house was also examined. Crader's comparisons, based on percentage of species present and body part distributions, showed that there was a difference between the two contexts. Meaty limb bone portions of sheep were found in the dry well, while non-meaty axial portions, such as cranial fragments, ribs, and vertebrae were found in the storehouse assemblage. Crader (1984:556) states that status differences were reflected in the respective faunal assemblages at Monticello.

Schulz and Gust (1983a, 1983b) provide another good example of reconstructing socioeconomic status from historic faunal remains. They looked at four sites in 19th century Sacramento, California, and based on historical documentation were able to determine the relative social status of the inhabitants of the sites. Schulz and Gust ranked the major meat cuts based on historical accounts of 19th century prices for the butchering units. They hypothesized that because retail cuts of meat were priced differently, the consumption of these cuts would vary depending on socioeconomic status and would be observable in the archaeological record (Schulz and Gust 1983a, 1983b).

The four sites used were the city jail, two saloons, and a hotel. The differences between the Hannan Saloon and the Klebitz and Green Saloon were based on land holdings of the owners and the size of the buildings. Results showed that the Golden Eagle Hotel had over 50% of its beef cuts coming from the short loin, the costliest portion

of beef meat cuts (Table 2.1). The Klebitz and Green Saloon had more of the middle value cuts, and the Hannan Saloon had higher percentages of lower value cuts. The city jail contained mostly soup bones and neck cuts of beef. Shulz and Gust (1983a) demonstrated that it is possible to determine the status of occupants of different sites by assessing the price of various beef cuts.

Lyman (1987) proposes a refinement of Shulz and Gust's model by not only taking account of the cost of a cut, but also the meat yield of a cut to determine cost efficiency. He believes that Shulz and Gust's (1983b) method of economic ranking is no more than a measure of cost. Lyman (1987:65-66) proposes to take into account "meat-yield per beef cut as related to the cost per beef cut (because it) ... provides an accurate measure of cost-efficiency of beef purchases, and that the measure is directly interpreted as reflecting income level and purchasing power". Lyman suggests that economic ranking of beef cuts based on meat yield and on cost-efficiency (e.g. Shulz and Gust 1983a) do not correspond. He believes a person with low purchasing power would optimize their return if they purchased a cut with more meat yield (Table 2.2). Based on research, the highest priced cuts do not necessarily contain the most meat. Cost efficiency and meat yield do not correspond to economic rank (Lyman 1987). Lyman suggests that although it is hard to show that cost-efficiency of beef cuts is correlated

Table 2.1: Skeletal Definition and Price Ranking of Beef Cuts ^a

Beef Cuts	Skeletal Definition	Price Ranking
short loin	lumbar vertebrae	1
rib	dorsal ribs 6-13; thoracic vertebrae 6-13	2
sirloin	ilium, sacrum	2
round	distal femur and diaphysis	3
rump	acetabulum, pubis, ischium, proximal femur	4
chuck	thoracic vertebrae 1-5; dorsal rib 1-5, scapula	5
arm	proximal humerus and diaphysis	6
cross/short rib	ventral rib 1-13	6
brisket	sternabrae, costal cartilage 1-5	7
short plate	costal cartilage 6-13	7
flank	none	7
neck	axis, cervical vertebrae 3-7	8
foreshank	distal humerus, radius-ulna	9
hindshank	tibia, astragalus, distal fibula, naviculo cuboid	9

^aafter Shulz and Gust 1983a:48

Table 2.2: Economic Ranking and Meat Yield Ranking of Beef Cuts^a

	Economic Rank	Total Pounds	Meat Yield Pounds	Meat Yield Rank
Beef Cut	(A)	(B)	(C)	(D)
short loin	1	30	20	3.5
rib	2	27	20	3.5
sirloin	2	21	12	7
round	3	42	25	2
rump	4	10	5	11.5
chuck	5	43	28	1
arm	6	23	15	6
cross/ short rib	6	12	6	10
brisket	7	12	5	11.5
short plate	7	24	18	5
neck	8	2	1	13
foreshank	9	12	7	9
hindshank	9	18	8	8

^a after Lyman 1987:62

with purchasing power, economic class, and income level, it is possible to theorize that a correlation exists behind this relationship (Lyman 1987:62).

A similar method of price scaling was used by Singer (1985) to determine socioeconomic status of 19th century New England based on relative price ranking index and butchery evidence from fish remains. He found a positive relationship between ranking index values and socioeconomic status as indicated from historical data at sites analyzed.

Recent work on how socioeconomic status is exhibited in the faunal record has shifted from the relative price rank and prospective meat yield of cuts to issues dealing with consumer choice (Branstner and Martin 1987; Garrow 1987; Huelsbeck 1991; Schmitt and Zeier 1993; Gibb 1996). It has been recognized that other factors besides social and economic status may affect what choices are made regarding subsistence practices.

Schmitt and Zeier (1993:22) state that there are three types of variation that affect consumer choice. The first type of variation is Systemic and refers to the relationship between the community and the markets. Variables that affect Systemic variation are differences in seasons, short and long term price changes, regional distribution centers,

costs of transportation from these centers to the communities, and fluctuations in availability of food due to short term problems.

The second type of variation is Structural which deals with the physical location where food is prepared. This may be a restaurant where a lot of food was prepared, or a residence where little or no frequent meal preparation was occurring. The functional identification of the historic structure represented will determine to what extent we are able to infer any ideas about socioeconomic status and consumer choice (Schmitt and Zeier 1993:23).

The last type of variation is Consumer Related. It has to do with different strategies related to individual, group, or commercial entities. Ethnic patterns of food preparation, economic status of the group or food preparer, and time investment in the preparation of the food (Schmitt and Zeier 1993) affect this variation. Schmitt and Zeier (1993) have shown that other variables affect what we see as a result of consumer choice.

Another researcher, D. Huelsbeck (1991), also looks at consumer behavior and faunal remains and states that most reports and results are not comparable because researchers fail to identify those factors that affect acquisition and consumption. In order to be able to compare the results, researchers must explicitly and consistently define their methods and what they are measuring.

Huelsbeck (1991) proposed a consumer behavior research framework, which takes into account factors that cause differences in availability of particular meats and factors influencing what choices are made by consumers. This framework looks at factors that affect availability and choice, classification of the faunal assemblage, and the nature of the data as related to taphonomy and recovery techniques (Huelsbeck 1991:62-63). His framework provides a standardized way of talking about choice, availability, methods of quantifying the assemblage in a meaningful way, and how to deal with taphonomic and recovery biases.

Garrow (1987) advocates using converging lines of evidence to determine the relative socioeconomic levels of previous occupants of historic sites. By using historical research, economic scaling of ceramics, and faunal analysis, he believes it is possible to generate a quantifiable notion of status. Consumer choice again is a key factor in these methods. By using only one technique, such as faunal analysis, it may not be adequate or acceptable to make realistic statements about socioeconomic status.

Zooarchaeologist Elizabeth J. Reitz (1987) agrees that differences in faunal usage and choices can not be attributed solely to status. Reitz examined the faunal reports from 21 plantation sites in the Southeast that ranged in age from the 17th to the 19th century. The assemblages contained faunal remains from areas inhabited by planters, overseers, slaves, and tenants. Her analysis showed no clear differences in the faunal sample based

on socioeconomic status. Status differences were not reflected in the usage of wild versus domestic species, the relative importance of domestic species, or the preference for pigs or cattle. She believes that taphonomic, environmental, and temporal variables also have a lot to do with the patterns we attempt to interpret. Recovery and analytical decisions made by the researcher may help better define cultural markers of status in the future (Reitz 1987:116).

Crabtree (1990) emphasizes the variables zooarchaeologists look at must be indicators of status. Some status indicators include butchery methods, the tools used in butchery, and methods of cooking. Other useful criteria besides species present and body part ratios must be developed. An example of this would be research into where the meat was obtained: from a large meat market, an individual butcher, or home butchery. Historical documentation in the form of cookbooks, newspapers, personal diaries, and accounts must also be utilized as sources (Crabtree 1990:176-177).

Bowen (1992) has suggested that the ambiguity in assigning certain assemblages as high status or low status is due, in part, to several problems. First, the meaning of status in these studies is not explicitly defined. Ambiguity is enhanced because factors of taphonomy and preservation of certain species are not addressed. Additionally, even with historical documentation, it is often impossible to determine whether a particular household was high or low status. Continuous occupation of an historic site also poses

problems in assigning specific time periods to different groups of individuals or households (Bowen 1992:272-273). The intermingling of researcher-defined high and low status cuts within an assemblage can be problematical. To counter this, Bowen advocates basing our status assessments on qualitative analyses of the different cuts of meat and their relative importance (Bowen 1992:274).

Biomass

One of the first attempts to quantify the relative contribution of a species to the human diet was by Theodore White (1953). His method is based upon the calculation of MNI values as determined by paired right and left skeletal elements. This figure is further multiplied by the amount of edible meat for an individual of “average” weight of that taxon, and is used to determine the total edible meat represented by an individual (White 1953).

This original method has been modified to include factors of age, sex, and size differences in estimating individual meat yields. However, as stated by Reitz et al. (1987), none of these alternatives or additions to White’s method has addressed the problem of allometric laws as applied to biological species.

Allometric equations explain the proportional changes in an element as related to absolute changes in the increasing size of the individual (Gould 1966; Smith 1980). As Gould states, “Allometry then is the study of size and its consequences” (1966:587). Allometric laws serve to define the structural relationship that exists between body mass and supporting skeletal structures (McMahon 1975; Pedley 1977; Prange et al. 1979). With increasing body mass as an individual grows, the skeleton must also change in order to support the increased stress of weight. These changes are proportional and constant. As well as skeletal mass scaling with body mass, other body functions such as metabolic rates and blood pressure also function this same way (Pedley 1977; Schmidt-Nielsen 1984). In archaeology, the use of allometric scaling is valuable when looking at bone weight and linear dimensions of weight bearing elements of the skeleton in order to determine the edible meat weight and/or biomass of a particular species and its contribution to the diet (see Noddle 1973, 1974; Emerson 1978; Reitz and Cordier 1983:238; Reitz and Honerkamp 1983:14-15; Reitz 1985, 1991, 1992, 1994; Klippel and Morey 1986; Purdue 1987; Reitz et al. 1987:305; Reitz and Quitmeyer 1988; Morey et al. 1991).

The formula used in allometric scaling is a power function, $Y = aX^b$ (Gould 1966; Smith 1980, 1984; Reitz and Scarry 1985; Reitz et al. 1987). This type of regression formula is more appropriate than a regular linear formula, $Y = a + bX$, because as pointed

out by Gould (1966) and others (McMahon 1973; Smith 1980), the relationship is more exponential or curvilinear than linear or isometric when applying dimensions to body mass (Edwards 1976:9; Grayson 1984:172; Reitz et al. 1987:305). The power curve involves a transformation of the X and Y values to a logarithmic scale. This will ultimately result in a transformation to a linear relationship (Edwards 1976:9). Thus, with the log-log transformation of X and Y , the formula becomes: $\log Y = \log a + b \log X$ (Edwards 1976:9-10; Smith 1980, 1984; Reitz and Cordier 1983:238; Reitz et al. 1987:305). In the formula, $\log a$ is the y -intercept of the natural log plot found through least squares regression. The slope of the line is designated by b . The variables X and Y can be defined in many ways, such as total bone weight, a linear dimension, or edible meat weight (Reitz and Cordier 1983). The dependent value, Y , is the archaeological unknown, and it is in some way related to a power of the X value (Edwards 1976:9-10). In the archaeological application of this method, using linear dimensions, this would be total live weight. The independent variable, X , can be a linear or skeletal mass measurement.

As part of this thesis project, an attempt was made to develop the constants a and b . The materials used consisted of cattle (*Bos taurus*) metapodials and phalanges. The elements were obtained from Helm's Slaughtering Company in Maynardville, Tennessee. Data was recorded for each specimen regarding the live weight before slaughter, the

breed, and the sex of the animal. A total of 42 specimens was used; of these, 12 were females, 19 were males, and 11 were of unknown sex. Sex categories were further delineated as either bull, steer, heifer, cow, or unknown. The weights ranged from 410 pounds to 1400 pounds.

After processing the legs through skinning, simmering, and dermestid beetle consumption of remaining tissue, a total of 42 measurements (Table 2.3) was taken following Von Den Driesch (1976). Measurements were in millimeters to the nearest tenth, and were taken with slide calipers and a bone measurement box. Each metacarpal and metatarsal was measured for greatest length (P21, P71), proximal breadth (P1, P51), and distal breadth (P2, P52). The same occurred for all proximal (1st) and middle (2nd) phalanges. For the distal phalange (3rd), measurements were taken for the diagonal length, dorsal surface length, and the breadth of the middle of the phalange (Figure 2.1). Measurements were taken on both the medial and lateral elements of a phalange where warranted.

The regression was performed on the data set made up from the sample that included all males, females, and unknown sexed individuals. In the regression, the measurements on the third phalanges proved to be the most significant (Table 2.4). Interpretation of the results through correlation coefficients (R) and the R² values can show several things. The correlation coefficients can be interpreted as a measure of the

Table 2.3: Measurement Codes for Cattle Elements

CARPAL

P1	Proximal Breadth of Metacarpal
P2	Distal Breadth of Metacarpal
P3	Greatest Length of 1 st Phalange (L)
P4	Proximal Breadth of 1 st Phalange (L)
P5	Distal Breadth of 1 st Phalange (L)
P6	Greatest Length of 1 st Phalange (M)
P7	Proximal Breadth of 1 st Phalange (M)
P8	Distal Breadth of 1 st Phalange (M)
P9	Greatest Length of 2 nd Phalange (L)
P10	Proximal Breadth of 2 nd Phalange (L)
P11	Distal Breadth of 2 nd Phalange (L)
P12	Greatest Length of 2 nd Phalange (M)
P13	Proximal Breadth of 2 nd Phalange (M)
P14	Distal Breadth of 2 nd Phalange (M)
P15	Diagonal Length of 3 rd Phalange (L)
P16	Length of Dorsal Surface of 3 rd Phalange (L)
P17	Breadth of Middle of 3 rd Phalange (L)
P18	Diagonal Length of 3 rd Phalange (M)
P19	Length of Dorsal Surface of 3 rd Phalange (M)
P20	Breadth of Middle of 3 rd Phalange (M)
P21	Greatest Length of Metacarpal

TARSAL

P51	Proximal Breadth of Metatarsal
P52	Distal Breadth of Metatarsal
P53	Greatest Length of 1 st Phalange (L)
P54	Proximal Breadth of 1 st Phalange (L)
P55	Distal Breadth of 1 st Phalange (L)
P56	Greatest Length of 1 st Phalange (M)
P57	Proximal Breadth of 1 st Phalange (M)
P58	Distal Breadth of 1 st Phalange (M)
P59	Greatest Length of 2 nd Phalange (L)
P60	Proximal Breadth of 2 nd Phalange (L)
P61	Distal Breadth of 2 nd Phalange (L)
P62	Greatest Length of 2 nd Phalange (M)
P63	Proximal Breadth of 2 nd Phalange (M)
P64	Distal Breadth of 2 nd Phalange (M)
P65	Diagonal Length of 3 rd Phalange (L)
P66	Length of Dorsal Surface of 3 rd Phalange (L)
P67	Breadth of Middle of 3 rd Phalange (L)
P68	Diagonal Length of 3 rd Phalange (M)

Table 2.3: Measurement Codes for Cattle Elements (Cont.)

P69	Length of Dorsal Surface of 3 rd Phalange (M)
P70	Breadth of Middle of 3 rd Phalange (M)
P71	Greatest Length of Metatarsal

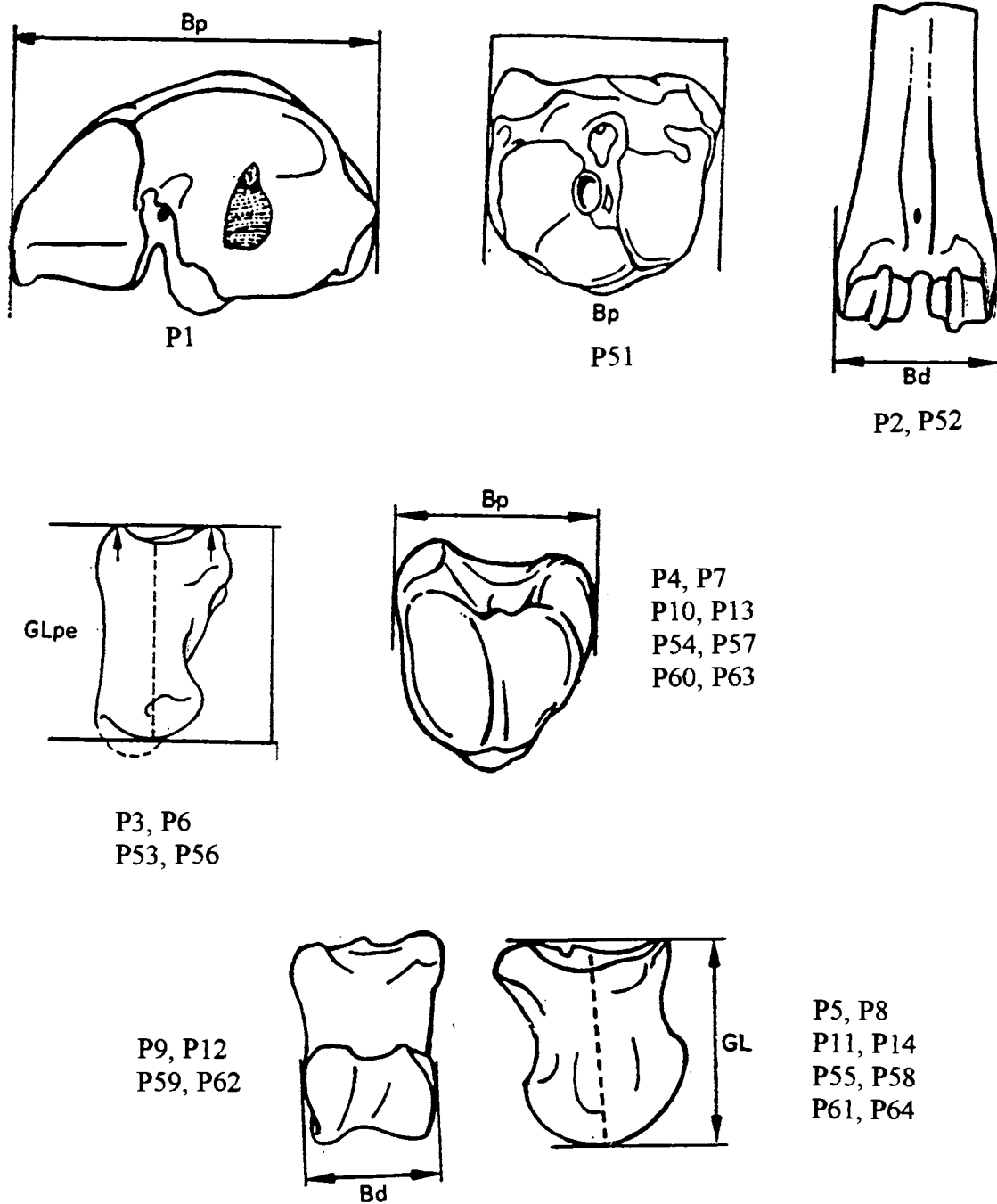


Figure 2.1: Measurements Taken on Cattle Metapodials and Phalanges and the Corresponding P-Codes

(Source: Adapted from Von Den Driesch 1976)

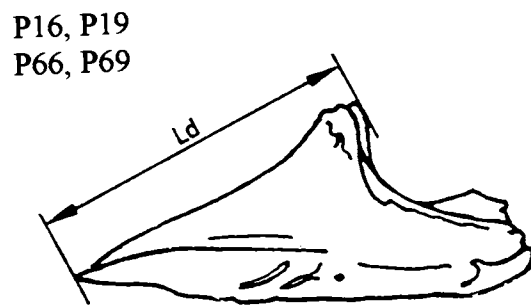
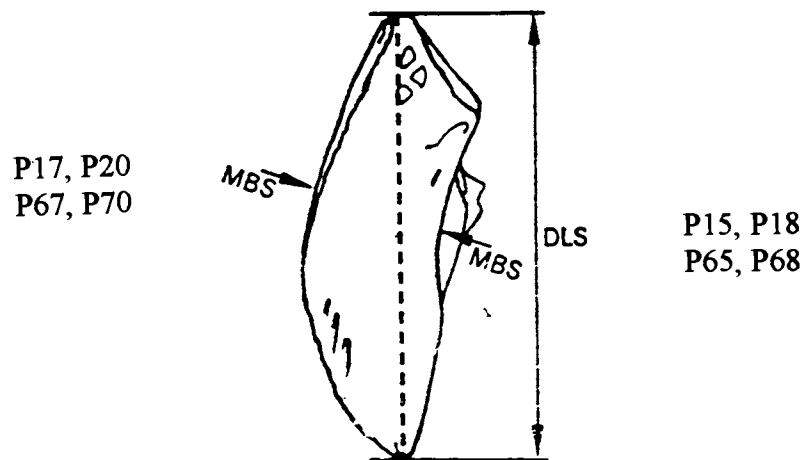


Figure 2.1 (Cont.)

(Source: Adapted from Von Den Driesch 1976)

Table 2.4: Regression Results for Third Phalange Measurements

Carpal Measurement Code	R²	Correlation Coefficient
P15	.58	.76
P16	.34	.58
P17	.49	.70
P18	.60	.77
P19	.36	.60
P20	.45	.67
Tarsal Measurement Code	R²	Correlation Coefficient
P65	.58	.76
P66	.35	.59
P67	.47	.69
P68	.60	.78
P69	.32	.57
P70	.46	.69

strength of the relationship, if it is present, between the two variables, X and Y (Edwards 1976:35). The R^2 values can often be interpreted as the proportion of the variance that the variables have in common, or how much variance is explained by those variables (Edwards 1976:44-45). However, it is recognized that in an archaeological sample it may be impossible to tell lateral from medial phalanges, or for that matter, carpal from tarsal phalanges. There is literature on the subject of determining front from hind phalanges and medial from lateral phalanges (Dottrens 1946; Empel and Roskosz 1963; Duffield 1978; Zeimens 1982).

It was determined that ‘collapsing’ the measurement database regarding medial versus lateral phalanges would be beneficial. This collapsed database for phalanges now contained 18 p-codes (Table 2.5). R^2 results again were highest for third phalanges and ranged from 0.01 to 0.58 (Table 2.6). Upon examining plotted residual results, it was determined that several outliers existed in the data. Robust regression was then run to account for the small sample size and the outliers (NCSS 1997:385). These outliers potentially influence the estimation of regression coefficients, R^2 results, and other regression statistics. Because the research goal was to find the best fit line and regression coefficients, robust regression was utilized (see Table 2.6). Additionally, multiple regression with robust techniques was used to determine if any combination of variables for specific phalanges produced significant results based on R^2 values. From Table 2.7,

Table 2.5: Collapsed Measurement Codes Without Medial and Lateral Designations

Code	Includes Original Code
P3	P3, P6
P4	P4, P7
P5	P5, P8
P6	P9, P12
P7	P10, P13
P8	P11, P14
P9	P15, P18
P10	P16, P19
P11	P17, P20
P12	P53, P56
P13	P54, P57
P14	P55, P58
P15	P59, P62
P16	P60, P63
P17	P61, P64
P18	P65, P68
P19	P66, P69
P20	P67, P70

Table 2.6: Regular and Robust Regression Results for Collapsed Measurement Codes

Code	Regular Regression R^2	Robust Regression R^2
P3	.12	.37
P4	.47	.71
P5	.01	.001
P6	.11	.28
P7	.20	.54
P8	.33	.63
P9	.57	.73
P10	.33	.59
P11	.47	.73
P12	.02	.0002
P13	.27	.59
P14	.05	.31
P15	.01	.00003
P16	.09	.35
P17	.03	.15
P18	.58	.74
P19	.33	.59
P20	.46	.71

Table 2.7: Robust Multiple Regression Results With Collapsed Measurement Codes

CARPAL		
1st Phalange Code	Regular Regression R²	Robust Regression R²
All (P3, P4, P5)	.47	.71
P3 and P4	.47	.71
P3 and P5	.12	.37
P4 and P5	.47	.71
2nd Phalange Code	Regular Regression R²	Robust Regression R²
All (P6, P7, P8)	.35	.63
P6 and P7	.20	.54
P6 and P8	.34	.63
P7 and P8	.34	.63
3rd Phalange Code	Regular Regression R²	Robust Regression R²
All (P9, P10, P11)	.67	.82
P9 and P10	.62	.81
P9 and P11	.60	.76
P10 and P11	.48	.73
TARSAL		
1st Phalange Code	Regular Regression R²	Robust Regression R²
All (P12, P13, P14)	.39	.42
P12 and P13	.27	.59

Table 2.7 (Continued)

1st Phalange Code	Regular Regression R²	Robust Regression R²
P12 and P14	.05	.31
P13 and P14	.38	.61

2nd Phalange Code	Regular Regression R²	Robust Regression R²
All (P15, P16, P17)	.11	.42
P15 and P16	.11	.35
P15 and P17	.03	.35
P16 and P17	.09	.33

3rd Phalange Code	Regular Regression R²	Robust Regression R²
All (P18, P19, P20)	.60	.81
P18 and P19	.59	.83
P18 and P20	.60	.76
P19 and P20	.47	.72

results show significant R^2 value increases when multiple measurements are used. The regression equations for the third phalanges are shown in Table 2.8. The goal now was to develop a method to validate separation of phalanges into carpal versus tarsal categories.

A further collapsed version of the database was now undertaken to facilitate the use of discriminant analysis to separate between front and hind phalanges. This further refinement involved combining all phalange measurements based on number into one phalange specific code, i.e. all measurements relating to phalange one were in code p3, p4, and p5 (Table 2.9). The distinction between carpal and tarsal phalanges was accomplished using a coding variable. All carpal phalange measurements were coded as '1' and tarsal phalange measurements were coded as '2'. From this research, and research reported in the literature, the value of discriminating between two classes, front versus hind phalanges, is useful. This is especially true when multiple regression results show an ability to estimate total live weight that is up to 83 percent accurate.

The estimation of total live weight for domestic species is one way of determining the relative importance of the species in the diet. It is another method utilized by zooarchaeologists to explain subsistence beyond species lists. Allometric equation estimations help to lend meat to the bones identified in an assemblage.

Table 2.8: Robust Regression Equations for Collapsed Measurement Codes

CARPAL

1 st Phalange Code	Robust Regression Equation
All (P3, P4, P5)	$Y = -1.259473 + 6.452003E-03(P3) + 2.626522(P4) + (-1.440678E-02)(P5)$
P3 and P4	$Y = -1.252734 + (-1.52063E-03)(P3) + 2.617673(P4)$
P3 and P5	$Y = -1.168737 + 2.117228(P3) + (-4.357321E-03)(P5)$
P4 and P5	$Y = -1.25149 + 2.62879(P4) + (-1.430779E-02)(P5)$

2 nd Phalange Code	Robust Regression Equation
All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(P6) + 0.552873(P7) + 1.987813(P8)$
P6 and P7	$Y = -1.068696 + (-0.1917752)(P6) + 2.709832(P7)$
P6 and P8	$Y = 0.2075883 + (-0.485665)(P6) + 2.26333(P8)$
P7 and P8	$Y = -0.3759893 + 0.2561972(P7) + 1.857123(P8)$

3 rd Phalange Code	Robust Regression Equation
All (P9, P10, P11)	$Y = -0.9541596 + 3.158913(P9) + (-1.759441)(P10) + 0.6015281(P11)$
P9 and P10	$Y = -1.938789 + 4.463588(P9) + (-2.12704)(P10)$
P9 and P11	$Y = -0.8405523 + 1.619268(P9) + 0.4027068(P11)$
P10 and P11	$Y = 0.3269238 + 0.74227538(P10) + 0.8156856(P11)$

TARSAL

1 st Phalange Code	Robust Regression Equation
All (P12, P13, P14)	$Y = -0.2066792 + 0.2777935(P12) + 4.188239(P13) + (-2.660844)(P14)$
P12 and P13	$Y = -0.8842666 + (-0.1330035)(P12) + 1.903133(P14)$
P12 and P14	$Y = 0.1254497 + (-0.1330035)(P12) + 1.903133(P14)$
P13 and P14	$Y = 0.1430974 + 4.155812(P13) + (-2.521223)(P14)$

Table 2.8 (Continued)

2nd Phalange Code	Robust Regression Equation
All (P15, P16, P17)	$Y = 1.320599 + (-2.018488)(P15) + 1.846974(P16) + 1.364123(P17)$
P15 and P16	$Y = 0.3594615 + (-0.9567379)(P15) + 2.606651(P16)$
P15 and P17	$Y = 2.426971 + (-1.961143)(P15) + 2.448752(P17)$
P16 and P17	$Y = -0.3879177 + 1.891868(P16) + 0.1757407(P17)$
3rd Phalange Code	Robust Regression Equation
All (P18, P19, P20)	$Y = -1.588473 + 2.656086(P18) + (-0.6705394)(P19) + 0.4913561(P20)$
P18 and P19	$Y = -2.963213 + 4.693845(P18) + (-1.648112)(P19)$
P18 and P20	$Y = -0.9289975 + 1.595139(P18) + 0.5720277(P20)$
P19 and P20	$Y = 0.3801728 + 0.5882179(P19) + 0.9930723(P20)$

Table 2.9: Measurement Codes Without Carpal or Tarsal Designations

Code	Includes Original Code
P3	P3, P6, P53, P56
P4	P4, P7, P54, P57
P5	P5, P8, P55, P58
P6	P9, P12, P59, P62
P7	P10, P13, P60, P63
P8	P11, P14, P61, P64
P9	P15, P18, P65, P68
P10	P16, P19, P66, P69
P11	P17, P20, P67, P70
	Carpal Tarsal (Code 1) (Code 2)

How each group defines quality is often determined by their cultural identity. Food serves as a metaphor of group identity and in this case, it defines the South as a cultural region and marks certain social boundaries within it (Hilliard 1988:311).

Southern Foodways

Agricultural Practices

One cultural marker defined by historians and others is the distinct culinary choices made by southerners in historic times. When we think of historic southern agriculture before the Civil War, invariably we think of the large coastal plantations. To run these plantations efficiently, adequate food resources were required. Inland farmers met these needs with diversified farming techniques (Hilliard 1972:22-25).

The interior regions of the South were important in the agricultural system as suppliers for the larger non-food producers on the coastal plains in the 19th century. Particularly in the uplands region of the South, diversity in crop planting was the key to success (Gray 1933:866-867).

The early pioneers in the Upland South region started small and were limited by the environment and their technological skills (Hilliard 1972:38). Historically, frontier settlement is seen as a rugged, isolated event that required reliance on wild foods for sustenance (Hilliard 1972:70). However, verifiable accounts of this phenomenon of heavy reliance on wild species is not well documented.

Foodways: Domestic Animals

Settlers brought enough cattle and hogs with them to get started in a new region. Pork was the most common domestic meat consumed in these early years and brood stock was relied upon for its high reproductive capabilities. Southern farmers relied intensively on corn and pork that were resources requiring the least amount of intensive labor for the high return demanded (Hilliard 1988:311). The importance of pork continued while beef and dairy products only came into play some years later. A surplus of livestock and food products took approximately five or six years to develop in the newly settled rural areas (Hilliard 1972:40).

Pigs continued to be heavily relied upon as the mainstay of the southern meat diet well beyond the Antebellum Period. Reasons for this are numerous. For example, pigs

were often allowed to roam freely on the landscape and were prolific reproducers (Jordan and Kaups 1989:120). This is directly related to high yield for the least amount of labor.

Pork was thought to be the ideal diet for hard-working people such as slaves and poor whites. In reality, however, pork cuts with a high fat content are protein and vitamin deficient and were sometimes considered not suitable for “delicate Southern women” (Hilliard 1988:311).

Slaughtering and curing were relatively simple for hogs as well, and most of these activities were concentrated on the farms and plantations (Wigginton 1972:189-198; Hilliard 1988:314). The most common curing methods involved dry salting, smoking, and pickling. After slaughtering, the pig carcass was divided into six or more pieces, covered with salt, and placed in a meat box for several weeks. Later it was removed, washed, and hung in the smokehouse over a low fire. With pickling, the portions were covered with brine solution in casks and left until needed. Because of the saltiness, the meat had to be soaked in water before it was palatable. The salt-smoke method of curing was preferred over pickling, even though pickling allowed for warmer weather slaughtering (Wigginton 1972:199-201; Hilliard 1988:314).

Additionally, most of the entire pig carcass was useful for subsistence (Hilliard 1972:43; Jordan and Kaups 1989:119-120). Hams, shoulders, ‘middlin’ (side meat), and jowls were the major areas where meat was derived. Lard was rendered for cooking and

other purposes. A residue from the rendering process, “cracklin’s,” was reserved for baking bread. The leaner pieces of the pig were used for sausage, souse, or headcheese, and the large intestines were utilized for the prized and traditional “chitlin supper” (Hilliard 1972:43). Other organs, such as the kidneys, liver, lungs, and brains were cleaned, then cooked, and consumed fresh (Wigginton 1972:202-207; Hilliard 1972). Several recipes called for the use of the head, tail, or backbone for stews, the making of scrapple, or for use in headcheese. The consumption of pickled pigs’ feet or roasted pigs feet and fried pork skins is still common in the South today (Wigginton 1972).

The overwhelming importance of pork in the southern diet is referenced in many travelers’ accounts into the area (Hilliard 1972:92). This is also reinforced by census documents from 1840, 1850, and 1860 which show Tennessee and Kentucky as the leading producers of pork in each of these years (Hilliard 1969, 1972).

Even though pork was the dietary mainstay of the South, other domestic animals were also used. Other researchers have stated that beef was the preferred meat in the South (Reitz and Honerkamp 1983). Beef was consumed, but not nearly on such a large scale as pork. More often, beef was consumed fresh in the colder months, as a respite from salt pork. Beef consumption was also low because it was more difficult to preserve. There is evidence, however, that beef was sometimes pickled or dried (Hilliard 1988:315). Physically, cattle are more suited for open field grazing, thus requiring more

tending. In the backwoods of early settlements, they were often vulnerable to attack by carnivores. Cows didn't reproduce as fast as pigs, thus lengthening the period until surplus stock was realized (Jordan and Kaups 1989:120).

Other domestic species sometimes utilized were sheep and goats. Mutton and lamb were minor foods in the South and weren't the mainstay of any regional diet in the United States prior to the Civil War (Hilliard 1988:315). Sheep and goats were possibly overlooked as a major food source because of the greater availability of pork and beef, not because of dislike. Others believe that sheep and goats were more inclined to disease and that environmental conditions, especially in the South, were reasons for the avoidance of these animals (Reitz and Honerkamp 1983:21). Their need for herders, slow reproductive capabilities as compared to pigs, and vulnerability in forests also contributed to the unfavorable status of sheep and goats among early settlers (Jordan and Kaups 1989:121). Gray (1933:832) cites a general dislike for mutton in the region based on historical accounts and the ease of predation by other species. Little quantitative data exist on the numbers of sheep and goats raised in the South during the late 19th century (Hilliard 1972:141). If and when it was consumed, mutton was more common among higher status individuals than poorer whites and slaves.

Poultry, such as chickens and turkeys, were utilized as well (Jordan and Kaups 1989). Fowl were raised for their eggs and meat and were seen as a periodic diversion

from pork (Hilliard 1972:145). They were used throughout the year and possibly were more important than beef or mutton. The long history of fowl usage and the traditional Sunday chicken dinner almost implies that fowl was seen as a semi-luxury item. The continued usage more likely has to do with several factors. First, chickens, in particular, could be kept on less feed than other animals, reinforcing the frontier goal of more return for the least amount of intensive labor. Second, there is a high reproductive potential and the species provides eggs as well as meat. Finally, the chicken could be killed on short notice for consumption, and therefore spoilage wasn't as much a concern (Hilliard 1972:145).

Native Species

As the farms began to prosper, the reliance on wild food supplements decreased. However, the amount of reliance on native species in general remains in question. Some New World historic sites, particularly in the Southeast, do show a heavy reliance on native wild animals as a main portion of the diet (Reitz and Honerkamp 1983). The intensity of reliance on native species is influenced by the environmental setting at hand (Young 1993).

Hunting for native resources took place mainly in the fall and winter. Native species utilized included wild turkey, rabbit, squirrel, opossum, white-tailed deer, and bear. Some venison and bear was smoked if not eaten fresh (Hilliard 1988:121). Other wild species caught and used for food were groundhog, raccoon, turtle, and frog (Wigginton 1972:249-273).

Summary

In the early years of historic zooarchaeology, adaptation to the environment of the New World on the Atlantic and Gulf coasts was the focus of the faunal reports, which often times were merely species lists. As the years passed, more research focused on other issues affecting subsistence choices. Issues of socioeconomic status and its indicators in the archaeological record became a promising area of research (Shulz 1979; Shulz and Gust 1983a, 1983b; Singer 1985, 1987; Lyman 1987). It was realized that factors besides social and economic status affect what choices were made regarding subsistence practices. Focus shifted from the individual cuts of meat and their relative utility or quality to issues on the level of the consumer and the resulting choices made (Branstner and Martin 1987; Garrow 1987; Reitz 1987; Crabtree 1990; Huelsbeck 1991; Bowen 1992; Schmitt and Zeier 1993; Gibb 1996).

The characterization of southern foodways as a pork dominated diet by historians and zooarchaeologists provides an arena in which to test hypotheses about socioeconomic status and dietary choices. Often, these researchers come up with differing results on what dietary preferences were in the early South (Hilliard 1969, 1972, 1988; Reitz and Honerkamp 1983; Reitz 1987; Crader 1990).

For example, pork is seen as the prime meat provider in the South by historians (Gray 1933; Hilliard 1988); however, based on data from coastal sites, some zooarchaeologists claim beef was the primary meat consumed (Reitz and Honerkamp 1983). As for the Upland South region, quantitative historical data are scarce and faunal reports are few (Breitburg 1983a; Bunch 1993; Young 1993; Lev-Tov 1994). However, these faunal reports do support the historical view of pork as the most utilized meat source.

The importance of wild taxa in the southern diet is also debated. No data exist for this type of subsistence, beyond the historical accounts (Wigginton 1972). As the frontier regions became more populated, it is possible that fewer native species were taken as a result of habitat degradation by human population. Food preferences in the South persisted once they were established. The perseverance of a corn and pork dominated diet occurred from early settlement in the late eighteenth century to well into the 20th century.

Chapter 3

Materials, Methods, and Goals

Materials

Colonel Francis Alexander Ramsey first came to East Tennessee in 1783 as part of a land grant survey party with James White, the founder of Knoxville (Faulkner 1986). The area James White and F.A. Ramsey surveyed would become what is now Knox County. In 1786 Ramsey received a land grant for Swan Pond, as the Ramsey House and its acreage came to be known (Roberts 1986:3). Swan Pond was formed as a result of a beaver dam that flooded two stream areas. Upon his arrival around 1793, F.A. Ramsey proceeded to drain Swan Pond. The family home, a large stone mansion that is still standing today, was built on a peninsula of the drained Swan Pond (Roberts 1986:3). Ramsey's temporary residence while the mansion was being built was, as Hesseltine describes:

... a temporary residence twenty feet by twenty feet a little in the rear and east of the site he had selected for his family mansion. It was of hewn logs, one story

high, a stone chimney in one corner, and covered with lap shingles (Hesseltine 1954:9).

In 1796 work was begun on the main house. The stone mansion was designed by English architect Thomas Hope and was described by Ramsey's son J.G.M. Ramsey as follows:

It was a large stone structure, a deep basement, and an attic besides two tall stories. Its corners, its arches, the top of its chimneys, and one row of building rocks, midway between the ground and the top of the square, were built of pure blue limestone... Its style was Gothic, long narrow windows, cornices richly carved in wood, but painted to resemble stone, massive, elaborately finished and ornamented. It is even yet a tasteful and imposing structure (Hesseltine 1954).

Others have described the house as:

an elegant fragment of the late Georgian neoclassicism popular in coastal towns in the early 1790's, limited and transformed, of course, by local resources and influenced to some degree by the older tradition of stone buildings (Patrick 1981:83).

The main house was completed in 1796-1797, and F.A. Ramsey lived there with his family until his death in 1820. At that time, Swan Pond was inherited by his second son, William Baines Alexander Ramsey. He lived there for several years; however, records are scarce as to activities on the farm from 1822 until the Civil War. At some time during his ownership, W.B.A. Ramsey did not live at the family home. Around 1840, the property was sold to his brother, James Gettys McCready Ramsey. J.G.M. Ramsey chose to live at his own farm, Mecklenburg, located at the Forks of the Holston River, and tenants took care of Swan Pond. In 1852, J.G.M. Ramsey's son Francis Alexander ("Alex") Frost Horlbeck Ramsey took over the management of Swan Pond. By 1857 his father had given the property to him, and Alex lived there until the Civil War started in 1861 (Faulkner 1996:2-3).

As a result of the ensuing war, the Ramsey family, staunch Confederates, were forced to leave the homestead. The political climate at the time in Knoxville was pro-Union. Alex served in the Confederate Army from 1862 to 1864, when he was captured and held for the duration of the war. Because of their Confederate sympathies, the Ramsey's were forced to sell Swan Pond and their land holdings (Faulkner 1996:3). This marked the end of Ramsey family control and the beginning of the Victorian Period of occupation at the site.

The estate was sold to William C. Spurgin in 1866, and according to Agricultural Census records for 1870 it was still a fairly large working farm (Faulkner 1996:3). In 1871, the Spurgins sold the 225-acre farm to Joseph L. and L.S. Keener. It was sold again in 1878 to W.A. and M.A. Keener. During this second Keener occupation, Swan Pond was reduced to between 100 and 150 acres. Despite the reduced acreage, records indicate production increased (Faulkner 1986:52).

The Keeners sold the 100 acres of Swan Pond to John Watson in 1884. The property actually was still in the Keener family, as Watson's wife was Nancy N. Keener Watson, the daughter of William Keener. Records indicate that Watson was the last person to actually live in the house and farm the land. Upon his death in 1912, the property was inherited by descendants, who allowed tenants to live on and work the farm. The family ultimately sold the property to the Appalachian Marble Company in 1924 (Faulkner 1986:52).

The marble company continued to rent the property to a succession of families through the 1930s and 1940s. In 1952, the house and property were purchased by the Association for the Preservation of Tennessee Antiquities (Faulkner 1996:4).

Methods

Previous Research

The earliest archaeological fieldwork at the Ramsey House was undertaken in 1973 and 1976. During the 1976 season, no site grid was used in the excavations. Only six pieces of bone were recovered; these were analyzed with materials from the fieldwork later conducted in 1985 (Roberts 1986:3).

The 1985 fieldwork began subsequent to a survey undertaken in 1983 in which the goal was to determine the location of the late 18th century outbuildings on the Ramsey farm (Carnes and Chapman 1984). Based on the survey results, two areas of the house yard had high probabilities of containing the structural remains of outbuildings.

Excavations were begun on July 9, 1985, under the direction of Dr. Charles H. Faulkner of the Department of Anthropology at the University of Tennessee. A grid system was established in two areas of the rear house yard, Area C and Area D. Figure 3.1 shows the locations of all Ramsey House testing and excavations. Area C was located in the northwest quadrant of the rear yard and was assumed to be the location of Francis

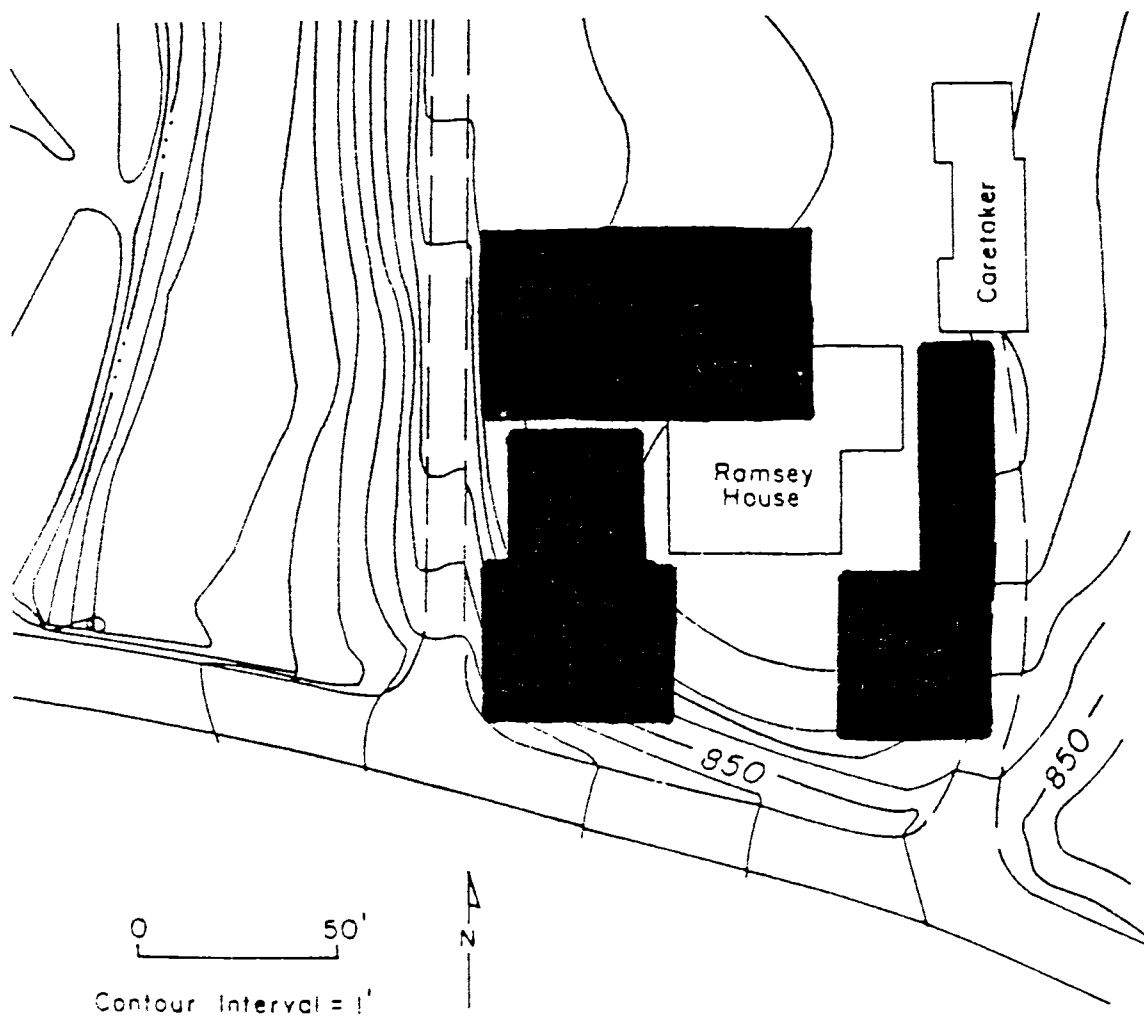


Figure 3.1: Location of Testing and Excavations at the Ramsey House (1985-1995)

(Source: Adapted from Roberts 1986)

A. Ramsey's office. Area D was near the back steps of the house and the kitchen addition where a well and cistern were located in the northeast quadrant (Roberts 1986:2-3).

Fifteen 3X3 foot units and one 3X1.5 foot unit were excavated during the four weeks of fieldwork. In addition, 181 post-hole tests were excavated. Eight features were discovered and either partially or totally excavated (Roberts 1986:7). These features range in age from the prehistoric Archaic Period to the 20th century. None of the features, units, or post-holes, however, revealed any late 18th or early 19th century structural evidence (Roberts 1986:7).

The unit excavations were conducted by trowel in 0.3-foot levels unless features or natural stratigraphy warranted finer divisions. All excavated deposits were dry-screened through ¼ inch hardware mesh. The 181 post-hole tests were excavated on three-foot centers with a hand held post-hole digger. The tests were approximately ½ foot in diameter and were excavated in 0.5-foot increments to a depth of one foot (Roberts 1986:4). These deposits were also screened through ¼ inch hardware cloth. These methods were used to sample the northwest quadrant of the rear yard for evidence of subsurface features. Numerous artifacts and 360 pieces of bone were recovered in the 1985 excavations.

Archaeological investigations were discontinued at the Ramsey House until 1994. The 1994 excavations were, in a sense, a continuation of work conducted in 1985. The

initial proposal submitted by Dr. Faulkner suggested excavations be limited to the east side yards of the house. The research design was altered when it was realized that due to time constraints, volume of artifacts, and documentary evidence, it would be more beneficial to include the west side yard in the testing. Combined with the 1985 testing, the immediate house yard, except the central rear yard, was tested by the end of the 1994-95 field season (Faulkner 1995:36-37). These areas were the most probable places to find outbuildings. Determining the layout of the structures, an original research goal, would permit an assessment of their function and mindset of the landowner and whether the pattern of placement was linear or dispersed. (Faulkner 1995:37).

A grid was established in the east and west side yards during August 1994. Using similar methods as in 1985, the excavations consisted of post-hole tests dug at three foot intervals in 0.5-foot levels. A posthole digger was used until subsoil was reached. All sediments were screened through ¼ inch mesh. A total of 686 post-hole tests was dug in the east and west side yards (Faulkner 1995:37-38).

Eighteen features were located in 402 tests excavated in the east side yard. Using the same scheme as 1985, the numbering started with Feature 10. Features important for structural evidence include Feature 10, described as a limestone concentration with an unknown function. Feature 11 consisted of a concentration of concrete and is dated to the 20th century. Feature 12 was another limestone concentration. Feature 13 was the

remains of a wooden fence post. Features 14, 15, and 16 were parts of a brick walkway that curves toward the kitchen entrance. Feature 17 and 18 were limestone concentrations with Feature 18 being a possible footer stone for a structure. Feature 19 was a loosely filled pit. Feature 20 was the remains of the cistern. Features 21, 22, 23, and 24 were limestone concentrations, possibly remnants of foundations. Features 26 and 27 were also limestone concentrations and were indicative of a foundation (Faulkner 1995:41-45). A total of 227 pieces of bone was recovered from the east side yard shovel test pits. Most of the bones were recovered from the northeast section and were associated with a possible foundation. This is the location of a probable smokehouse identified during the 1995 excavation season (Faulkner 1995). The other bone concentration is in the southwest area of the east side yard, close to the formal yard area. This bone concentration is highly fragmented (Faulkner 1995:64-65).

A total of 284 test pits was dug in the west side yard where cultural materials were not as dense as in the east side yard. Only 12 features were located in this area which appears to have seen less cultural activity than the eastern yard (Faulkner 1995:53). Features 28, 29, 30, and 33 were limestone concentrations. Features 31 and 32 were marble flake concentrations. Features 34 through 39 were modern drainpipe intrusions (Faulkner 1995:57-58).

Of the material remains recovered, only 40 pieces of bone were identified from the west side yard. These bones were highly fragmented and were concentrated in two areas, one in the southeast section and the other near the southwest corner of the house (Faulkner 1995:84). The few faunal remain in this area of the west yard may be due to its proximity to the 'formal' area of the yard. Presentation of the yard and how an area looked would have been important to the landowner.

The 1995 excavations were by far the most extensive. The excavations were part of a University of Tennessee summer field school under the direction of Dr. Charles H. Faulkner. The area under investigation was again the east side yard. The initial goal was to define the size, function, and construction techniques of the 18 features revealed in 1994 testing (Faulkner 1996:7). Artifact distributions and structural evidence indicated that six of the features warranted further intensive testing.

Six 3 X 3 foot units (Units 17-22) were excavated in the proximity of these features. The soils were dry screened through ¼ inch mesh and feature soil was water screened through 1/16 inch mesh. Flotation samples were also taken from the deeper cultural deposits and the features (Faulkner 1996:7).

The excavations revealed that most of the initial units showed evidence of structural remains, so an additional 16 units were opened up to further define the

structures. A total of 27 new features was defined in addition to relocating seven of the features found in the 1994 excavations (Faulkner 1996:13).

The 1995 excavations revealed three structures in the east side yard. Artifacts associated with Structure 1 date to the late 18th century. The dimensions of the structure, the presence of a hearth and fireplace, and the ashy deposits suggest that this may have been the location of the original smokehouse built on the Ramsey farm. It is probably one of the earliest buildings on the site (Faulkner 1996:33-34).

Structure 2 was superimposed over Structure 1, and judging from the dimensions of the limestone footers, was a much more substantial building. Faulkner (1996:34-35) suggests that this is most likely a barn type structure, perhaps a stable. Based on mean ceramic dating, this building was built between 1840 and 1860. Its absence in a photograph taken in 1898 indicates the building was razed during the last quarter of the nineteenth century (Faulkner 1996:35).

Structure 3 is the most problematic of the outbuildings discovered in the east side yard. Its architectural form and domestic function have not been defined. Artifactual evidence dates the construction of this building to ca. 1840-1860. It was probably razed at the same time as Structure 2, as it is not seen in the 1898 photograph. Figure 3.2 shows the location of the structures in the east side yard. A total of 1210 pieces of bone was

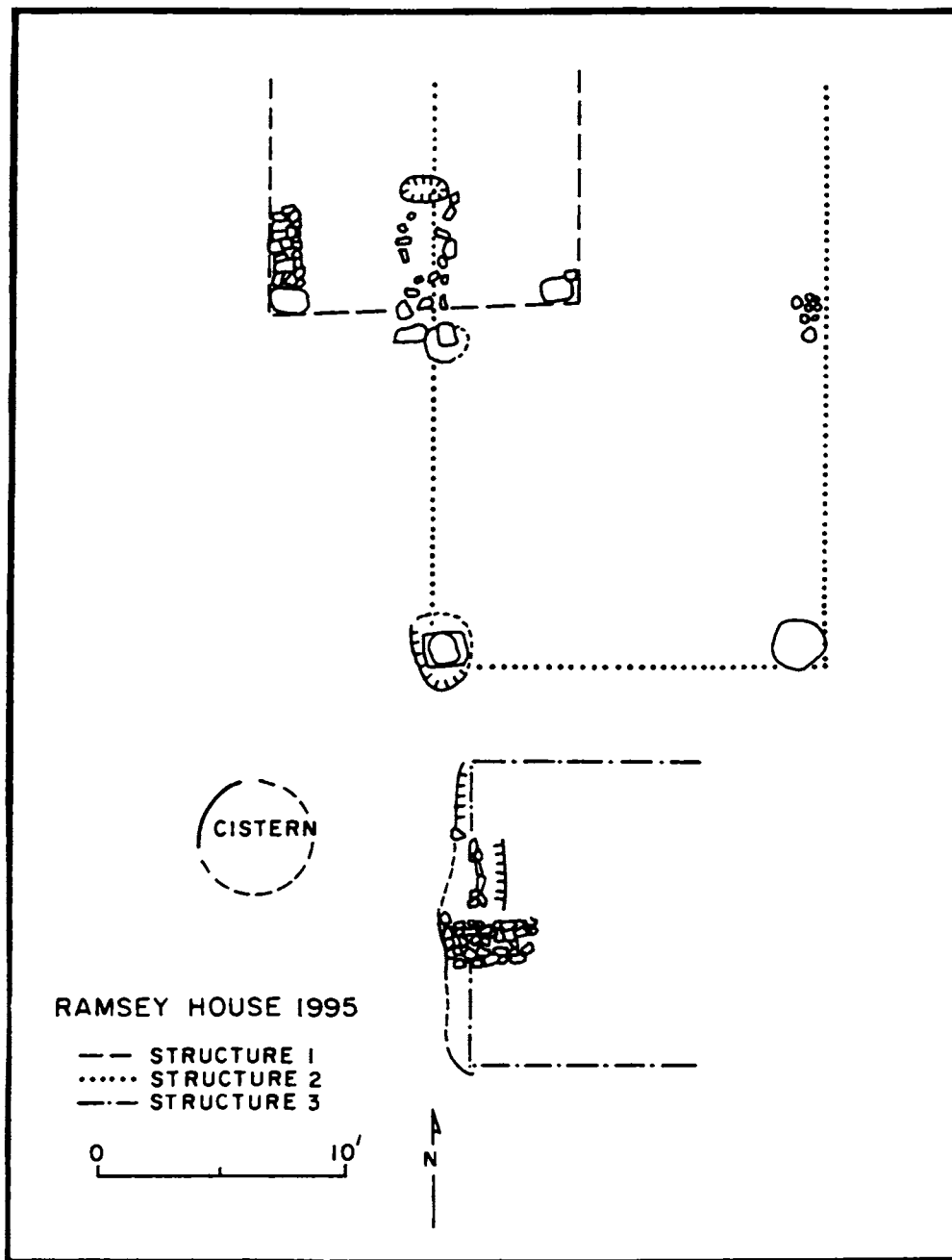


Figure 3.2: Location of Structures from the 1995 Excavations

(Source: Adapted from Faulkner 1996)

recovered from the 1995 excavations. Because the excavations were conducted in an area with well-dated contexts, species utilization through time can be assessed.

Faunal Analysis

The Ramsey House faunal assemblage is important for several reasons. First, the historical importance of the Ramsey family in Knoxville's early history has already been established. Second, because of their endeavors and financial standing in the community, one may say that their status was higher than an average frontier farm occupation and therefore, their material culture should reflect this higher status. The occupation of this site and its location in the Upland South region of Tennessee is important as well. Little archaeological data exist from sites such as this, especially from earlier time periods. Finally, the continuous occupation of this site from the late 18th century to the 20th century provides us with a long timespan to analyze domestic activities, particularly those related to subsistence, and to determine whether change or consistency occurred in dietary preferences.

All of the vertebrate faunal remains from the Ramsey House were identified using the Vertebrate Comparative Collection in the Zooarchaeology Laboratory at the University of Tennessee, Department of Anthropology. Bones were identified to the

lowest possible taxonomic category. All unidentifiable bones were assigned to size categories ranging from very small to large. Passerine birds, such as robins and sparrows, have been classified as “very small”. Small rodents, such as voles and mice, were also included in the very small category. Bones representative of birds and mammals such as chickens, raccoons, and squirrels were placed in the “small” category. Remains classified as “medium-sized” were based on pig, sheep, and goat sized bones. The large mammal category consisted of cattle and horse sized remains. A category also exists for unknown size and class.

For each excavation season, Minimum Numbers of Individuals (MNI) and Number of Identified Specimens (NISP) were calculated as a basic method of quantifying the assemblage. Within each year, calculations were also made based on context and its attributable time period. For some excavations this was not possible, and another method of comparing the faunal assemblage was used, primarily east versus west yard artifact patterning.

As stated by others, both MNI and NISP have their shortcomings (Grayson 1979, 1984; Klein and Cruz-Uribe 1984; Breitburg 1991; Ringrose 1993). MNI is calculated by looking at paired skeletal elements. First introduced by White (1953), it is done by separating the most abundant elements into their left and right sides and using the largest number as the unit of calculation. The measure can be further refined by assessing age

and size variables (Grayson 1979). With MNI, the greatest problem deals with aggregation. The criteria used to aggregate a site affect the calculation of MNI. The more divisive the contexts, such as strata, arbitrary levels, time periods, or features, the closer the MNI values will approach NISP values (Grayson 1979,1984; Reitz and Scarry 1985). However, if the contexts are not mixed and the aggregation units can not be further divided, the MNI values may actually be more representative of actual individuals brought back to the site (Grayson 1984:67). Other problems with MNI include the assumption that an entire animal was consumed at the site, with the animal being represented by the identified element. This may or may not be the case, as indicated by butchery, exchange behaviors, or market evidence. By examining element distribution from the assemblage, the evidence can be evaluated. Another problem concerns the importance of smaller species in the diet. While more smaller species, such as fish, may be identified at a site, their relative importance in the diet when compared to one identified deer is considerably less (Reitz and Scarry 1985)

NISP is obtained by an actual count of bone or tooth fragments assigned to a particular taxon. Criticisms exist for this measurement of taxonomic abundance in a faunal assemblage as well. First, the measure is affected by butchery and subsequent patterns thereof, and the subjective nature of species identification. Collection and taphonomic agents also affect the validity of the measurement. The greatest criticism

deals with element interdependence (Grayson 1979, 1984). How do we know which elements and fragments come from different animals in the assemblage?

Despite the criticisms, MNI and NISP values were calculated for the Ramsey faunal materials. However, only NISP measures are used here when considering taxonomic abundance. While it is acknowledged that there is the problem of element interdependence, it is assumed to be less of a problem than site aggregation.

Another method used to circumvent the problems of NISP and MNI deals with the development of measures estimating the meat weight or available meat based on recovered bone. There are several methods that attempt to accomplish this, and again each has its limitations. One method is to use bone weight and multiply it by an appropriate factor, assuming that bone weight is a constant percentage of meat weight. Casteel (1978) has shown that the relationship is not linear but curvilinear, and two constants must be derived. The meat weight estimate can only be used for individuals, and not for an entire assemblage (Casteel 1978). This method is rejected because it is impossible to determine if the bones come from one individual, i.e. element interdependence.

A second method involves multiplying MNI values by an average weight for that particular species (White 1953; Stewart and Stahl 1977; Lyman 1979). This method

suffers from the general problems of using MNI values. The meat weight measure gives an ordinal value of general dietary contribution at best.

A third method, that gives accurate meat weights for individuals, is one that uses allometric scaling (Reitz and Scarry 1985). Allometric equations based on skeletal mass or linear dimensions of bones provide more accurate and biologically based estimates than those that rely on edible meat measures. No assumptions are made regarding the original weight of the animal; they are determined empirically. Weight estimates have been calculated based on allometric scaling for measurable bones in the Ramsey House assemblage.

Other characteristics of the bones were noted as well. Butchery marks were recorded as to their type, location, and cut represented. The interpretation of cuts represented will be used to infer markers of status and carcass division for each time period. Taphonomic alteration of the bone in the form of burning, weathering, and carnivore or rodent gnawing was also recorded for the assemblage.

Goals

Because there has been limited archaeological work in the Upland South area of the United States, one of the main goals of this thesis is to establish a basic pattern for Upland South subsistence in the late 18th and early 19th centuries for a particularly wealthy family. Specifically, this dietary pattern should be visible when compared to other assemblages such as urban farmsteads or plantation sites across the mid-South. It may be possible to see 'wealth' in species utilized and differences in butchered cuts consumed. However, the rural nature of the Ramsey site in the frontier period may overshadow any differences regardless of status.

Another goal is to compare the earlier occupational periods of the Ramsey family with those in the later years. One may expect differences with the farm going out of the Ramsey family's control and the reduced land holdings. If there was a reliance on wild species in the Ramsey period, decreased use might be expected in the later periods as Knoxville becomes a more established town.

Chapter 4

Species Utilization at the Ramsey House

Introduction

The Ramsey House faunal assemblage contained 1931 fragments of bone and shell. Of these, 789 were identifiable to genus or species. A total of 1054 pieces of bone and shell was identifiable to class and assigned to a size category. Eighty-eight fragments were unidentifiable to taxonomic category. A species list for the entire assemblage shows the relative abundance of the taxa identified (Table 4.1). Remains of mammals, birds, fish, and mollusks were recovered.

Mammals

Mammal remains were the most numerous in the Ramsey House assemblage. Percentages in Table 4.1, and in the text, are based on total number of bones identified to genus or species. Domestic mammals dominated the assemblage and of these approximately 92 % were pigs and cattle. Pig bone contributed 67 %, while cattle only

Table 4.1: Species List for the Entire Assemblage at the Ramsey House Site

Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	538	68.19	6	19.35
<i>Bos taurus</i>	domestic cattle	205	25.98	6	19.35
<i>Equus caballus</i>	domestic horse	1	0.13	1	3.23
Caprine	domestic sheep/goat	2	0.25	1	3.23
<i>Canis familiaris</i>	domestic dog	1	0.13	1	3.23
<i>Sylvilagus floridanus</i>	eastern cottontail	18	2.28	4	12.90
<i>Sciurus carolinensis</i>	gray squirrel	5	0.63	3	9.68
<i>Odocoileus virginianus</i>	white-tailed deer	2	0.25	1	3.23
<i>Sigmodon hispidus</i>	hispid cotton rat	2	0.25	2	6.45
Mammalia	small-sized mammal	83	--	--	--
	medium-sized mammal	306	--	--	--
	large-sized mammal	11	--	--	--
	mammal, size undetermined	566	--	--	--
BIRDS					
<i>Gallus gallus</i>	domestic chicken	7	0.89	4	12.90
Aves	very small-sized bird	12	--	--	--
	small-sized bird	49	--	--	--
FISHES					
<i>Aplodinotus grunniens</i>	freshwater drum	8	1.01	2	6.45

Table 4.1 (Cont.)

Species	Common Name	NISP	%	MNI	%
unidentifiable bone		88	--	--	--
	MOLLUSKS				
Mollusca	mollusks, unidentifiable	27	--	--	--
Totals		1931	(100)	31	(100)

comprised 25 % of the total identified assemblage. Only two bones were identified as sheep or goat (i.e. Caprine), and they constitute less than 1 % of the identifiable bone. Horse, dog, and cotton rat bone were recovered, but these are not considered food remains here.

Native mammals were poorly represented in the assemblage. Eastern cottontail, gray squirrel, white-tailed deer, and cotton rat have been identified. Eastern cottontail remains were the most numerous (N= 18) and contributed 2.2 % of the total. White-tailed deer and gray squirrel each represent less than 1 % of the native mammals potentially utilized as food.

Birds

Bird remains in the Ramsey assemblage were quite scarce. Only domestic chicken bones were identified and their remains make up less than 1 % of the identified assemblage. A total of 105 pieces of eggshell was recovered. These most likely represent domestic chicken eggs.

Fish

Fish remains were represented by one species, the freshwater drum (0.99 %, N=8). Otoliths, a lower pharyngeal, a dorsal spine, and an operculum were identified.

Mollusks

Twenty-seven pieces of shell were identified. It is likely that these represent freshwater mollusk species. However, it is possible that marine shellfish were available, as American oyster was recovered at the Gibbs House Site (Lev-Tov 1994). Because Tennessee is a land-locked state, marine shellfish were probably purchased at a market. Goods for sale advertised in 1806 from Nashville indicate oysters and other shellfish were available (Alvey 1997:95). While the Nashville frontier was supplied with goods from New Orleans, Knoxville merchants had access to similar goods from major cities such as Baltimore and Philadelphia, as well as Richmond and Lynchburg, Virginia, and Salem, North Carolina (Alvey 1997:108).

Summary

In general, the entire Ramsey bone assemblage is dominated by medium to large domestic mammals, mostly pigs and cattle. Domestic chicken remains are the only avian species identified to genus recovered. Wild species are represented by terrestrial mammals, such as deer, squirrels, and rabbits. Fish was identified, but in very small numbers.

A further breakdown of the bone assemblage, by periods, was accomplished using data obtained from mean ceramic dates and window glass thickness (Faulkner 1996).

Period I- 1795 to 1820

Two hundred and forty-seven pieces of bone and shell were recovered from Period I deposits. Of these, 67 were identifiable to species. The domestic species represented were pigs and cattle. Native species included white-tailed deer, a potential food source, and cotton rat, which probably was not used as food. Aquatic species included freshwater drum. Bird remains were not represented in this period. Table 4.2 shows NISP values for each species identified.

Table 4.2: Species List for the Period I Assemblage at the Ramsey House Site

Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	49	73.14	2	33.33
<i>Bos taurus</i>	domestic cattle	14	20.90	1	16.67
<i>O. virginianus</i>	white-tailed deer	1	1.49	1	16.67
<i>Sigmodon hispidus</i>	hispid cotton rat	1	1.49	1	16.67
Mammalia	unidentified	[163]	--	--	--
FISHES					
<i>A. grunniens</i>	freshwater drum	2	2.99	1	16.67
MOLLUSKS					
Mollusca	unidentified	[4]	--	--	--
Unidentified fragments		[13]			
Totals		247	(100)	6	(100)

* Note: Numbers in brackets are not used in calculating percentage of NISP

Approximately 94 % of the remains identifiable to species are either pig or cattle. A total of 167 pieces of bone and shell was identifiable to class, with a majority of them belonging to mammals of medium to large size. Native species occur in very small numbers. Thirteen fragments were unidentifiable.

Period II- 1820 to 1866

The second period contained 370 pieces of bone and shell. Again, domestic species dominated with 112 fragments identified as pig and 15 attributable to cattle. One caprine fragment was recovered. Two domestic chicken bones were recovered from this period. Native species recovered included rabbit (N=3) and freshwater drum (N=2). (see Table 4.3 for NISP values).

Domestic species are the most common. This seems to be the pattern on an historic Upland South plantation. It is interesting that few native species were represented for the two earliest periods. This may be the result of the Ramsey family utilizing commercial markets in early Knoxville for a portion of their subsistence. This is a direct contrast to the general historical view that early life on the frontier was harsh and the diet had to be supplemented with native species until animal husbandry was successfully established (Gray 1933; Hilliard 1972; Winters 1996). Perhaps this is an

Table 4.3: Species List for the Period II Assemblage at the Ramsey House Site

Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	112	82.96	1	16.67
<i>Bos taurus</i>	domestic cattle	15	11.11	1	16.67
Caprine	domestic sheep/goat	1	0.74	1	16.67
<i>Sylvilagus floridanus</i>	eastern cottontail	3	2.22	1	16.67
Mammalia	unidentified	[199]	--	--	--
BIRDS					
<i>Gallus gallus</i>	domestic chicken	2	1.48	1	16.67
Aves	unidentified	[9]	--	--	--
FISHES					
<i>A. grunniens</i>	freshwater drum	2	1.48	1	16.67
MOLLUSKS					
Mollusca	unidentified	[10]	--	--	--
Unidentified fragments		[17]	--	--	--
Totals		370	(100)	6	(100)

*Note: Numbers in brackets are not used in calculating percentage of NISP

indicator of the Ramsey family's ability to rely on their wealth to meet their subsistence needs.

Period III- 1866 to 1912

The Victorian period contexts contained 322 faunal remains. Domestic species again were dominant. Pig contributed 113 pieces of bone, while cattle were represented by 15 fragments. Caprine remains were also identified from this period. Domestic chicken again was present (N=4). More native species were identified during this period as well. Rabbit and white-tailed deer as well as cotton rat were recovered. Freshwater drum was also identified. Table 4.4 shows NISP values for this period.

Periods IV and V- 1912 to present day

Period IV dates from 1912 to 1950 and is combined with the final period dating to the present day. A total of 198 pieces of bone was recovered from the contexts. Of this total, 74 fragments were identifiable to genus or species. Species identified were pig, cattle, squirrel, and rabbit. Pig and cattle represented approximately 90% of the identified species (Table 4.5). No birds, fish, or mollusks were identified from these periods.

Table 4.4: Species List for the Period III Assemblage at the Ramsey House Site

Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	113	77.40	2	18.18
<i>Bos taurus</i>	domestic cattle	15	10.27	1	9.09
Caprine	domestic sheep/goat	1	0.68	1	9.09
<i>S.floridanus</i>	eastern cottontail	9	6.16	3	27.27
<i>O.virginianus</i>	white-tailed deer	1	0.68	1	9.09
<i>Sigmodon hispidus</i>	hispid cotton rat	1	0.68	1	9.09
Mammalia	unidentified	[146]	--	--	--
BIRDS					
<i>Gallus gallus</i>	domestic chicken	4	2.74	1	9.09
Aves	unidentified	[19]	--	--	--
FISHES					
<i>A. grunniens</i>	freshwater drum	2	1.37	1	9.09
MOLLUSKS					
Mollusca	unidentified	[6]	--	--	--
Unidentified fragments		[5]	--	--	--
Totals		322	(100)	11	(100)

*Note: Numbers in brackets are not used in calculating percentage of NISP

Table 4.5: Species List for the Period IV and V Assemblage at the Ramsey House Site

Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	38	51.35	2	33.33
<i>Bos taurus</i>	domestic cattle	30	40.54	1	16.67
<i>Sciurus carolinensis</i>	gray squirrel	2	2.70	1	16.67
<i>Sylvilagus floridanus</i>	eastern cottontail	4	5.41	2	33.33
Mammalia	unidentified	[111]	--	--	--
BIRDS					
Aves	unidentified	[6]	--	--	--
MOLLUSKS					
Mollusca	unidentified	[5]	--	--	--
Unidentified fragments		[2]	--	--	--
Totals		198	(100)	6	(100)

* Note: Numbers in brackets are not used in calculating percentage of NISP

Overall, the Ramsey assemblage is dominated by terrestrial animals, primarily domestic mammals. Native mammals are present, but do not seem to have contributed much to the diet. Figure 4.1 shows taxa composition by period.

1994 Excavations

This portion of the Ramsey faunal assemblage required a different method of representation and reporting. Reasons for this include a majority of the remains come from post-hole tests, none of faunal remains come from dateable contexts, and a contrast between the east and west side yards was possible and seemed the most plausible way to report the results.

A total of 317 pieces of bone and shell was recovered in the east and west side yards. Of this total, 142 were identifiable to genus and species. One hundred and fifty-seven fragments were assigned to class and a size category. Bones from disturbed contexts numbered 18. Approximately 91 % of bones identified to genus and species came from the east side yard. Species identified included pig (N=93), cow (N=34), dog (N=1), and domestic chicken (N=1). Table 4.6 gives NISP values for each species and the location numbers for species as well. Bones identified to class Mammalia were primarily in the medium sized category (N=56) or the unknown sized category (N=93). A

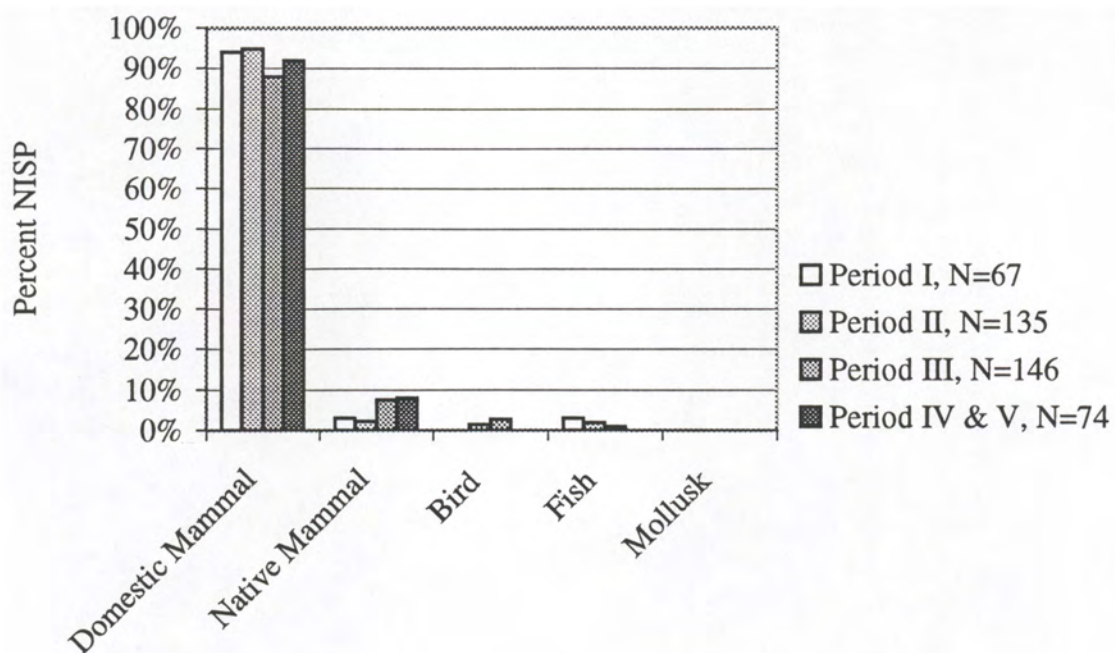


Figure 4.1: Taxa Identified by Period at the Ramsey House Site

Table 4.6: Species List for the East and West Side Yard Assemblages at the Ramsey House Site

EAST SIDE YARD					
Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	93	72.09	1	20
<i>Bos taurus</i>	domestic cattle	34	26.36	2	40
<i>Canis familiaris</i>	domestic dog	1	0.78	1	20
Mammalia	unidentified	[125]	--	--	--
BIRDS					
<i>Gallus gallus</i>	domestic chicken	1	0.78	1	20
Aves	unidentified	[2]	--	--	--
MOLLUSKS					
Mollusca	unidentified	[3]	--	--	--
Unidentified fragments		[18]	--	--	--
Total		277	(100)	5	(100)
WEST SIDE YARD					
Species	Common Name	NISP	%	MNI	%
MAMMALS					
<i>Sus scrofa</i>	domestic pig	11	84.62	1	50
<i>Bos taurus</i>	domestic cattle	2	15.38	1	50
Mammalia	unidentified	[27]	--	--	--
Total		40	(100)	2	(100)

total of 277 bones was from the east side yard versus 40 from the west side yard. More bones were recovered in the east side yard due to the location of the smokehouse in this quadrant of the yard and direct access from the kitchen. The west side yard is related to the more formal area of the house yard and was most likely kept clean of debris.

Butchering Patterns

Pig

Butchered pig remains consisted of 37 elements or 46% of all butchered remains. The majority of marks occur on the limb bones (N=22). Butchery marks on axial elements numbered eight and head elements contained seven marks. The most numerous mark identified was done by a saw. It is likely that both hand and power saws were used at different time periods. Another identified mark resulted from chopping; five bones were altered in this way. Table 4.7 and Figures 4.2 and 4.3 list the location and type of marks found on pig bones in the Ramsey assemblage.

Three bones from Period I were classified as being chopped. One scapula head was chopped, most likely for carcass division into a picnic ham. One radius and one ulna also exhibited chopping marks. These cuts are also related to a picnic ham cut or roast of pork. Somewhat problematical is one indeterminate, medium size class, piece of bone

Table 4.7: Location and Type of Butchering Marks on Pig Bones in the Ramsey House Assemblage

Skull Element	Mark	Number
ascending ramus	sawn	2
occipital condyle	sawn	2
skull fragments	sawn	3
Total		7

Axial Element	Mark	Number
rib	sawn	4
vertebra	sawn	1
vertebra	cut	1
scapula	chopped	1
scapula	sawn	1
Total		8

Limb Element	Mark	Number
humerus	sawn	3
ulna	chopped	1
radius	chopped	1
femur	sawn	3
tibia	sawn	3
metapodial	sawn	1
second phalanx	chopped	1
second phalanx	sawn	1
Total		14

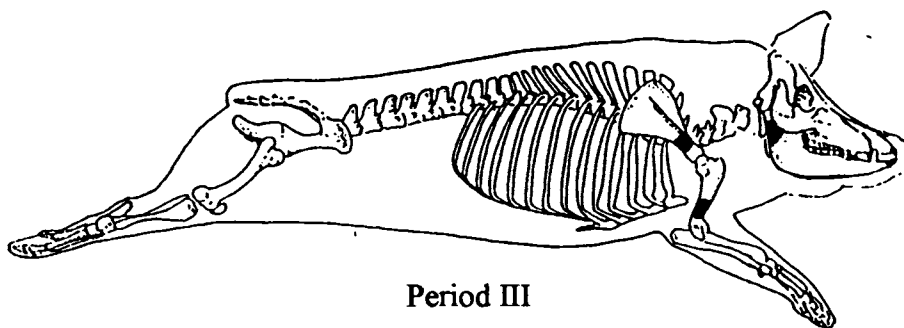
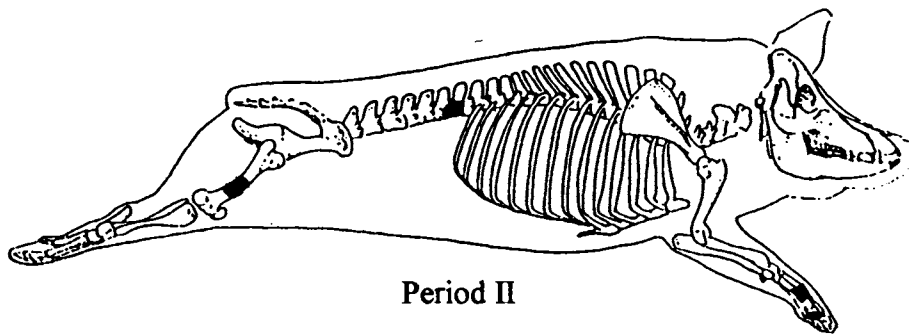
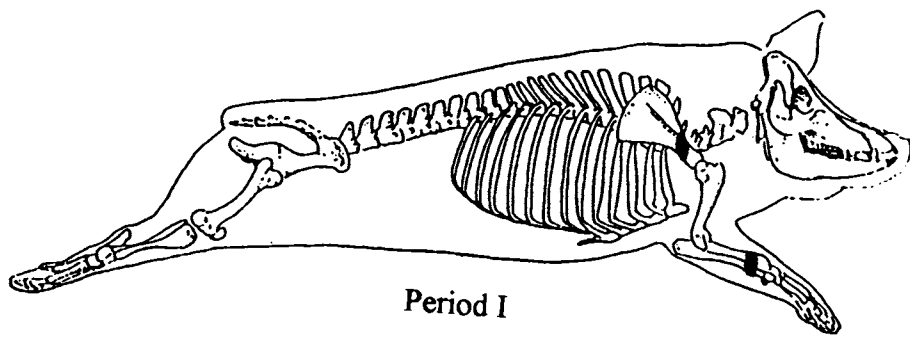


Figure 4.2: Location of Pig Butchering Marks for Each Occupation Period at the Ramsey House Site

(Source: Adapted from O'Steen 1986)

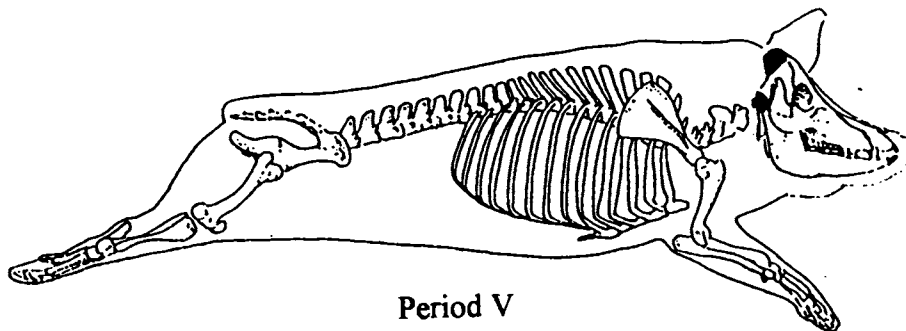
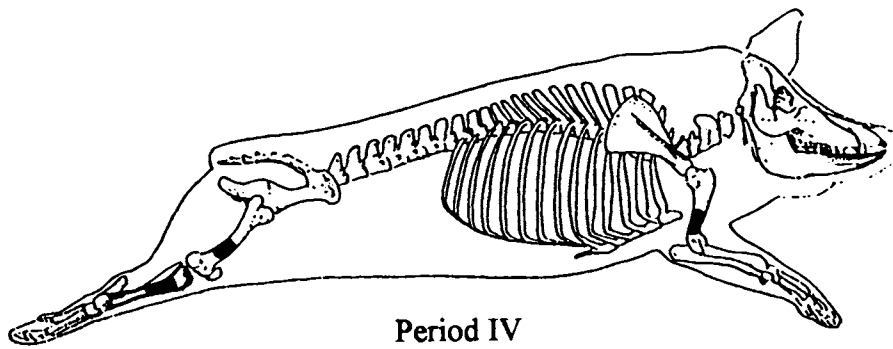


Figure 4.2 (Cont.)

(Source: Adapted from O'Steen 1986)

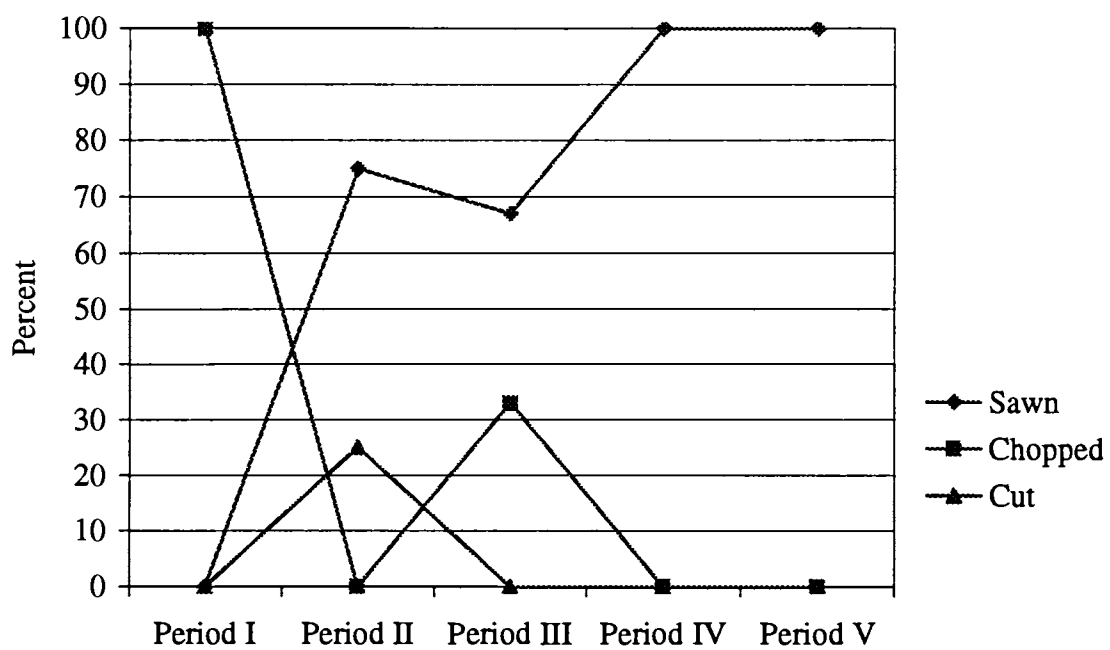


Figure 4.3: Hog Butchery Mark Types By Period at the Ramsey House Site

that is sawn. During this early period one would suspect that the Ramsey family was practicing some form of home butchery as evidenced by the marks on the butchered remains. However, this piece of sawn bone indicates that possibly the Ramsey's were either utilizing the services of a butcher or incorporating sawing into their home butchering technology.

There is evidence that the first butchers in Knoxville were in business as early as 1794. An ad placed in the *Knoxville Gazette* on May 16, 1794 by John Chisolm states:

"The subscriber gives notice to the inhabitants of Knoxville and its vicinity, that he intends to open a Beef Market on the first of June next, where they may be supplied with BEEF every third day during the season."

While this ad is for a beef market, it is reasonable to assume that pig butchering was also taking place in Knoxville at this time. It also shows that markets for surplus livestock were needed early in Knoxville's history. This is understandable as Knoxville was a major thruway for drover's taking their stock to the Atlantic seaboard (Rogers

1929:36;Burnett 1946; Winters 1996:52-53) and trade in commodities was occurring regularly with larger cities such as Baltimore, Philadelphia, Richmond, Augusta, and New Orleans (Rogers 1929; Imlay [1797] 1968; Smith [1842] 1974; Winters 1996). A beef market was likely needed to accommodate such large quantities of meat produced by one butchered cow. A family would need redistribution links in the community to get rid of

the surplus beef before spoilage occurred or a place to obtain beef due to the large undertaking of raising, maintaining, and butchering a cow.

Pig butchery in Period II consists of five elements. One vertebral centrum is cut lengthwise, from carcass division. Modified limb elements include one femur, a metapodial, and a phalange. All of these elements were sawn. Also, one shaft fragment tentatively identified as pig was sawn. The presence of lower leg elements and the vertebral fragment likely indicate primary butchery waste and home consumption.

Period III butchery involved head elements and two ascending rami; sawn limb elements included a scapula and a humerus. Again, all of these elements were sawn. Two limb shafts were also identified and these were chopped. The sawn jaws are indicative of the tongue removal or removal of the lower jaw from the skull. The scapula and humerus elements could have been picnic ham or roast cuts. The elements identified in Period IV were the most numerous in terms of butchering marks. Limb elements consisting of the humerus, femur, and tibia were identified. Longbone shafts also exhibited three butchery marks. All of these elements were sawn. It is likely that these represent purchased retail cuts of meat.

Period V contained head elements that were sawn. Two occipital condyles and three indeterminate skull fragments were most likely altered during removal of the head at slaughtering and opening of the skull for removal of the brain.

The butchery evidence for the five periods (Table 4.8) indicates that in the earliest period chopping was the preferred method of dividing and butchering the carcass of pigs. After this time, sawing was used more frequently. Whether this was the result of differing technology used on the farm or perhaps the utilization of services of a butcher will be discussed later. However, the presence of a large number of isolated pig teeth may indicate a home butchery model.

Meat cuts have been used by researchers to infer some measure of socioeconomic status (Shulz and Gust 1983a; Lyman 1987). Examples of this include the work of Shulz and Gust (1983a), who compare cost per pound of meat and assign an economic rank to the meat cuts. Lyman (1987) adds to their model factors of edible meat yield per cut and cost-efficiency as potential indicators of status. While these measures of meat abundance do indicate purchasing power, they may or may not reflect status. At issue is whether the Ramsey assemblage consists of whole animals butchered on site, as indicated by element distributions, or whether smaller portions of carcasses were brought to the site from a market. If the animals were butchered on site, retail price ranking will not indicate status. A more useful measure to assess status is relative meat yield available from different carcass portions as indicated by butchered remains. Did the Ramsey occupants utilize high or low yield cuts and is there any patterning? It is hypothesized that higher status individuals or families (e.g. the Ramsey family) had access to and would utilize the

Table 4.8: Location and Type of Pig Butchering Marks for Each Period at the Ramsey House Site

PERIOD I

Limb Element	Mark	Number
scapula	chopped	1
radius	chopped	1
ulna	chopped	1
indeterminate fragment	sawn	1

PERIOD II

Axial Element	Mark	Number
vertebra	cut	1

Limb Element	Mark	Number
femur	sawn	1
metapodial	sawn	1
second phalanx	sawn	1
shaft	sawn	1

PERIOD III

Skull Element	Mark	Number
ascending ramus	sawn	2

Limb Element	Mark	Number
scapula	sawn	1
humerus	sawn	1
shaft	sawn	2

Table 4.8: (Cont.)

PERIOD IV

Limb Element	Mark	Number
humerus	sawn	1
femur	sawn	1
tibia	sawn	1
shaft	sawn	3

PERIOD V

Skull Element	Mark	Number
occipital condyle	sawn	2
skull fragment	sawn	3

meatier and generally more expensive cuts of meat, while lower status people (e.g. later owners and tenants) would consume cheaper, low yielding cuts of meat.

An attempt was made to compare the different cuts represented by classifying the cuts as to high, medium , or low yield. This method is similar to that used by O'Steen (1986) and Young (1993). However, for the purposes of this thesis only butchered remains are utilized in the analysis. This distinction represents actual meat cuts consumed versus other methods which consider the meat cuts that were available based on element distribution.

High meat yield portions and the bones included are the loin and rump (lumbar and sacral vertebrae, front of pelvis), pelvis or aitchbone (pelvis and head of femur), upper hind leg (femur), upper fore leg (humerus), shoulder (scapula, humerus), rib cage, and thoracic vertebrae. Meat portions considered medium yield include the neck (cervical vertebrae), fore and hind shanks (radius, ulna, tibia, and fibula), head and jaw (cranium and mandible). Low yield meat cuts are represented by foot elements (carpals, tarsals, metapodials, and phalanges). This division into relative meat yield of different areas of the carcass generally follows values found in Levie (1970) and Aldrich (1922) and they are the same for beef and pork. Therefore further division into sub-categories for each species is not necessary.

All butchered remains from an occupation period in the Ramsey assemblage were classified as to high, medium, or low meat yield. Figure 4.4 shows the relative percentages of high, medium, and low yield pork cuts by period. There is an increase through time for high yield cuts with a sharp drop during the final period. Medium yield cut usage initially is high but drops and then rebounds in the later periods. Low yield cuts are most prevalent in Period II. Based on the impression that status of the occupants decreased through time at the Ramsey House, it seems that meat yield based on cuts present does not reflect this. High yield cuts increase through time rather than decrease. The contributing factor of medium yield cuts in Period I points to an equal utilization of high and medium yield cuts of pork. The question of how to interpret medium yield cuts as an indicator of status is hard to answer. An alternative interpretation may indicate a difference in the producing economy of the farm.

Element distribution within each period was calculated for pig (Table 4.9) and it seems that the occupants were practicing home butchery. Isolated teeth, cranial fragments, mandibular fragments, and lower leg elements are found in each period in high numbers. Axial elements, such as ribs, vertebrae, and pelves, are more numerous than high meat yielding elements of the upper leg and fore/hind shanks. Interpretation of this patterning leads to a basic subsistence economy while perhaps selling the meatier cuts (e.g. hams, roasts, picnic hams) to market (Winters 1996: 41). Winters (1996) states this

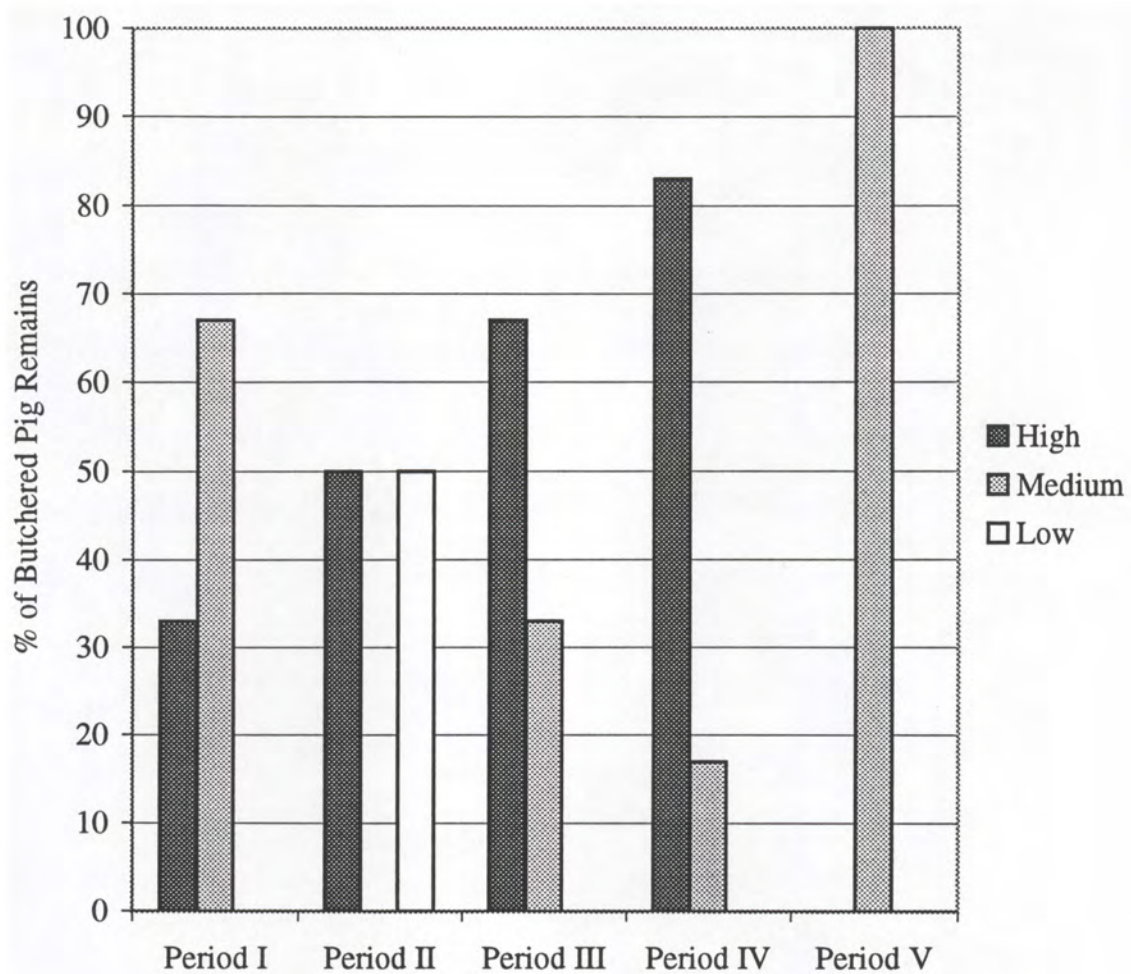


Figure 4.4: Percentages of High, Medium, and Low Meat Yield Pork Cuts at the Ramsey House Site

Table 4.9: Element Distribution for Pig Remains in Each Occupation Period at the Ramsey House Site

Element/Group	I	II	III	IV	V
Cranial Fragments		4	8	1	5
Mandibular Fragments	7	18	17	11	
Isolated Teeth	23	63	43		5
Cervical Vertebrae		3	6		
Thoracic Vertebrae					
Lumbar Vertebrae					
Caudal Vertebrae					
Indeterminate Vertebrae	1	4	2	2	
Ribs	11	6	5	14	
Scapula	1		3		
Pelvis			5		
Humerus	1	3	1	1	
Radius		1			
Ulna			1		
Femur		1			
Tibia			1	1	
Fibula					
Carpals/Tarsals		2			1
Metapodials		2	4		
Phalanges		3	3	4	
Totals		40	110	100	31
					11

* Column values are NISP values of identified elements

situation occurred in Tennessee when the farm had achieved a degree of self-sufficiency in relation to the family's own stores of foodstuffs. This is also particularly true when the size of the farm is considered. He hypothesizes that while the larger farms also produced stores for home consumption, they also focused heavily on producing marketable goods (Winters 1996:37).

Another method used to determine which type of meat production was occurring on the farm is epiphyseal fusion and tooth eruption and wear data (Silver 1969). Wapnish and Hesse (1988:84) have delineated three animal production models. The first is a production/consumption model where all age classes are found in the mortality profile. The second is a 'consuming economy' model where the primary components of the mortality profile are market-age animals with very few animals of reproductive age. The third is a 'producing economy' model where more older animals and a few very young animals are found with market age animals absent.

Of the 538 pig bones identified, from the Ramsey House assemblage, 31 bones were attributable to an age class as designated by Silver (1969). The majority of the bones fall into the age category of two years or younger. Hogs mature quickly and reach their optimum finishing weight of 150 to 250 pounds in roughly one year (Aldrich 1922; Bull 1951). It is not likely that the Ramsey occupants were using improved pure breeds, as the first push for agricultural and livestock innovations did not occur in Tennessee

until the late 1830s to 1850s (Winters 1996). The use of improved breeds was advocated as early as 1830, and most improvement took the form of cross-breeding the common scrub hog with the purebreds. The demand was for a hog that would produce the most pork in the shortest amount of time (mature quickly), utilize the least amount of feed (cheap), and be able to handle the rigors of walking to market without losing an inordinate amount of weight (profitable) (Shepard [1886] 1974:10; Winters 1996:169-170). While some elements from older animals were identified, these were more likely the breeding stock for new litters. Figure 4.5 shows the representation of the age groups in the Ramsey House assemblage.

Cattle

A total of 43 cattle elements exhibited butchering marks. This represents 54% of all butchered remains identified for domestic species. The most common location for butchering marks was on axial elements (Table 4.10 and Figure 4.6). Most of these were on ribs. A limb bone exhibited three marks. A majority of the bones were sawn, with one bone either sawn or cut. A total of 22 butchered bones was attributable to a specific occupation period (Table 4.11). Period I contained one rib fragment that was sawn. No shaft or head fragments were recovered. In Period II, one vertebral centrum was either

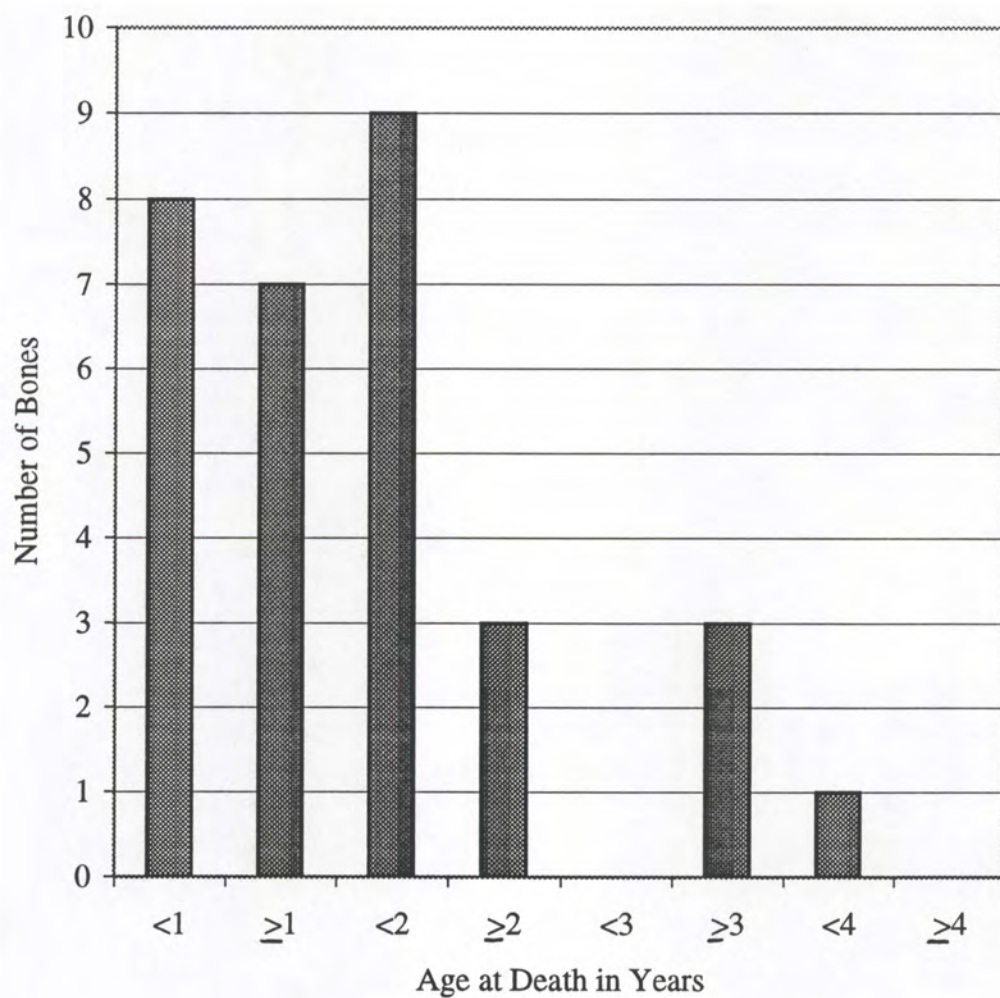


Figure 4.5: Hog Mortality Profile Based on NISP for the Ramsey House Site

Table 4.10: Location and Type of Butchering Marks on Cattle Bones in the Ramsey House Assemblage

Axial Element	Mark	Number
rib	sawn	39
vertebra	sawn/cut	1
illum	sawn	2
Total		42

Limb Element	Mark	Number
tibia	sawn	1
Total		1

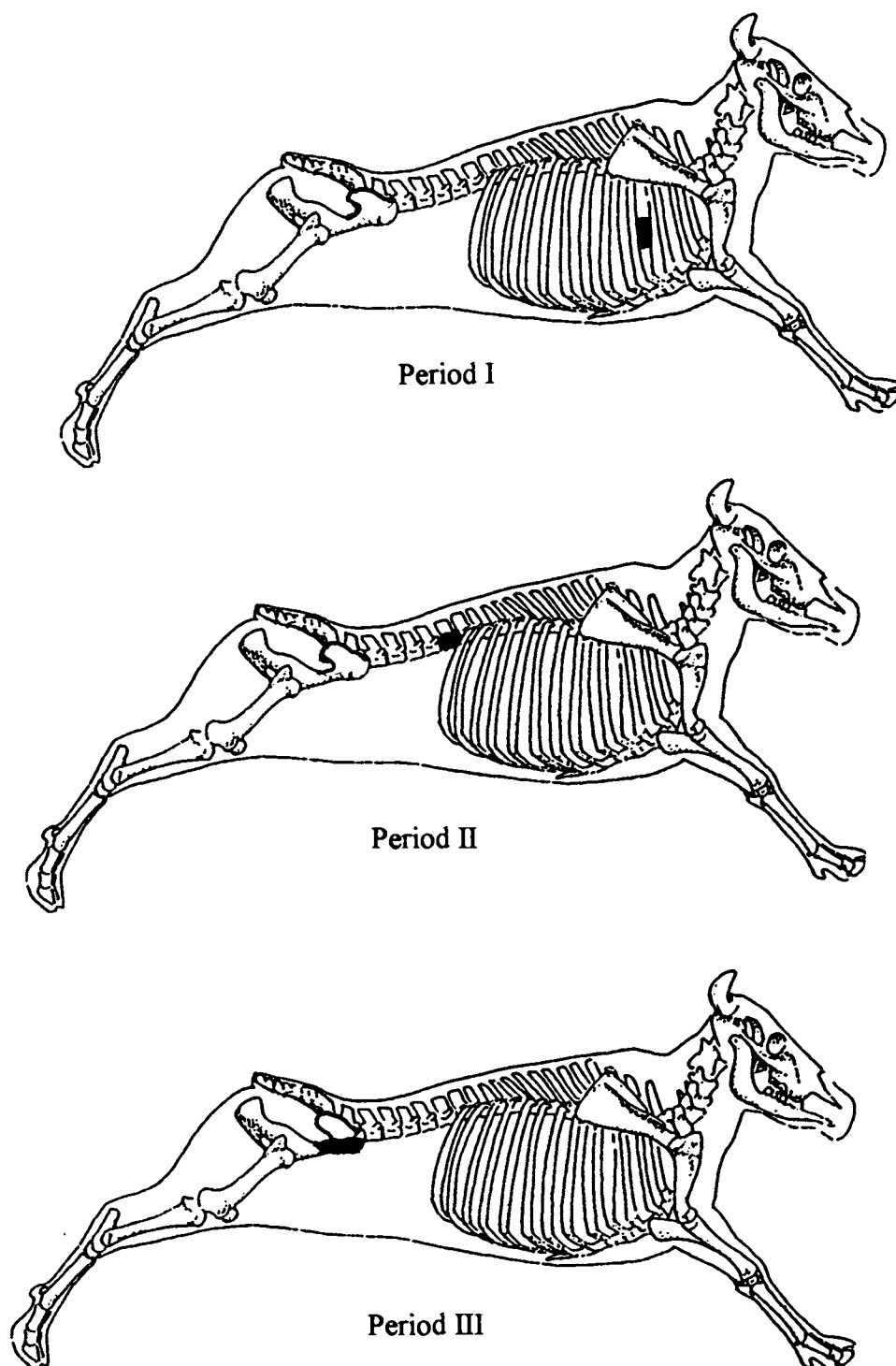
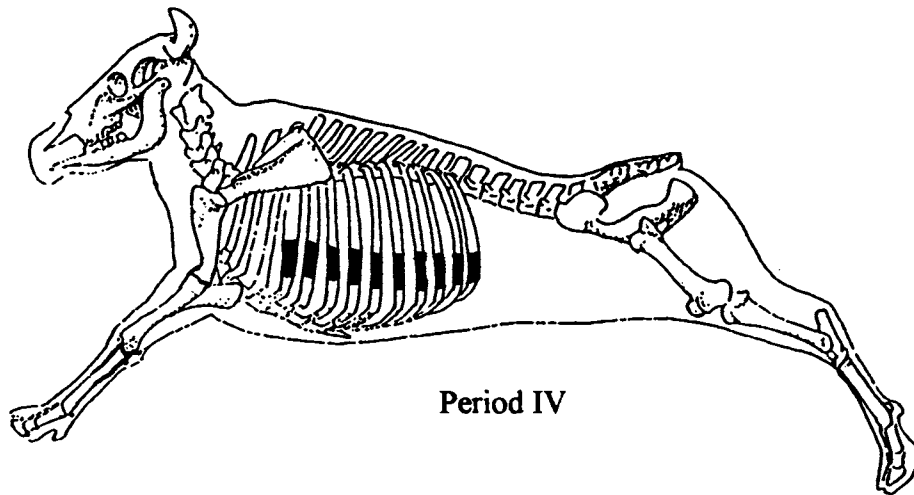
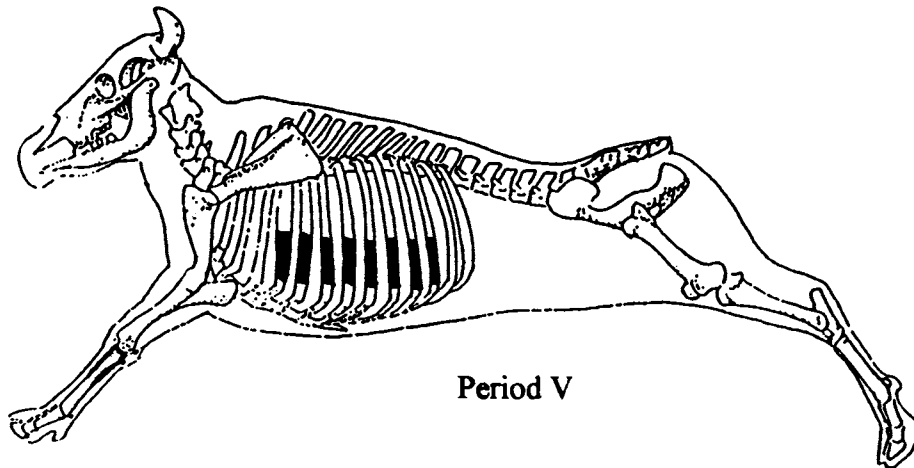


Figure 4.6: Location of Cattle Butchering Marks for Each Occupation Period at the Ramsey House Site

(Source: Adapted from O'Steen 1986)



Period IV



Period V

Figure 4.6 (Cont.)

(Source: Adapted from O'Steen 1986)

Table 4.11: Location and Type of Cattle Butchering Marks for Each Period at the Ramsey House Site

PERIOD I		
Axial Element	Mark	Number
rib	sawn	1
PERIOD II		
Axial Element	Mark	Number
vertebra	sawn/cut	1
PERIOD III		
Axial Element	Mark	Number
illum	sawn	2
PERIOD IV		
Axial Element	Mark	Number
rib	sawn	10
PERIOD V		
Axial Element	Mark	Number
rib	sawn	8

sawn or cut. It most likely indicates carcass division. Period III, two fragments of an illium were sawn. These cuts correspond to sirloin cuts. In Periods IV and V, butchered bone numbered 18 rib segments that were sawn. Rib cuts are the most prevalent butchered remains for cattle. These represent middle or short rib cuts of meat that were used for roasting or stews (Aldrich 1922:35; Tomhave 1925:132; Levie 1970:222-223).

For beef cut remains, the interpretation is clear cut. One hundred percent of the cuts identified fall into the high yield cut realm (Figure 4.7). In addition, Period I-V materials are all sawn.

Additionally, beef may have been purchased from a market, as a beef market was in operation and advertised in the *Knoxville Gazette* as early as 1794.

Element distribution for cattle (Table 4.12) indicates that ribs and legs were present. Cranial elements are absent except for isolated teeth. If primary butchering occurred at the site, head fragments would be expected. Metapodials and phalanges are few in number and, along with isolated teeth, indicate that cattle were processed on the site. However, it is unlikely that entire carcasses were being processed and consumed. The data suggest that smaller portions of beef carcasses such as, roasts, steak cuts, and ribs, were being purchased elsewhere and brought on site. Few cattle bones were identified that provide information about age at slaughter or any indication of what type

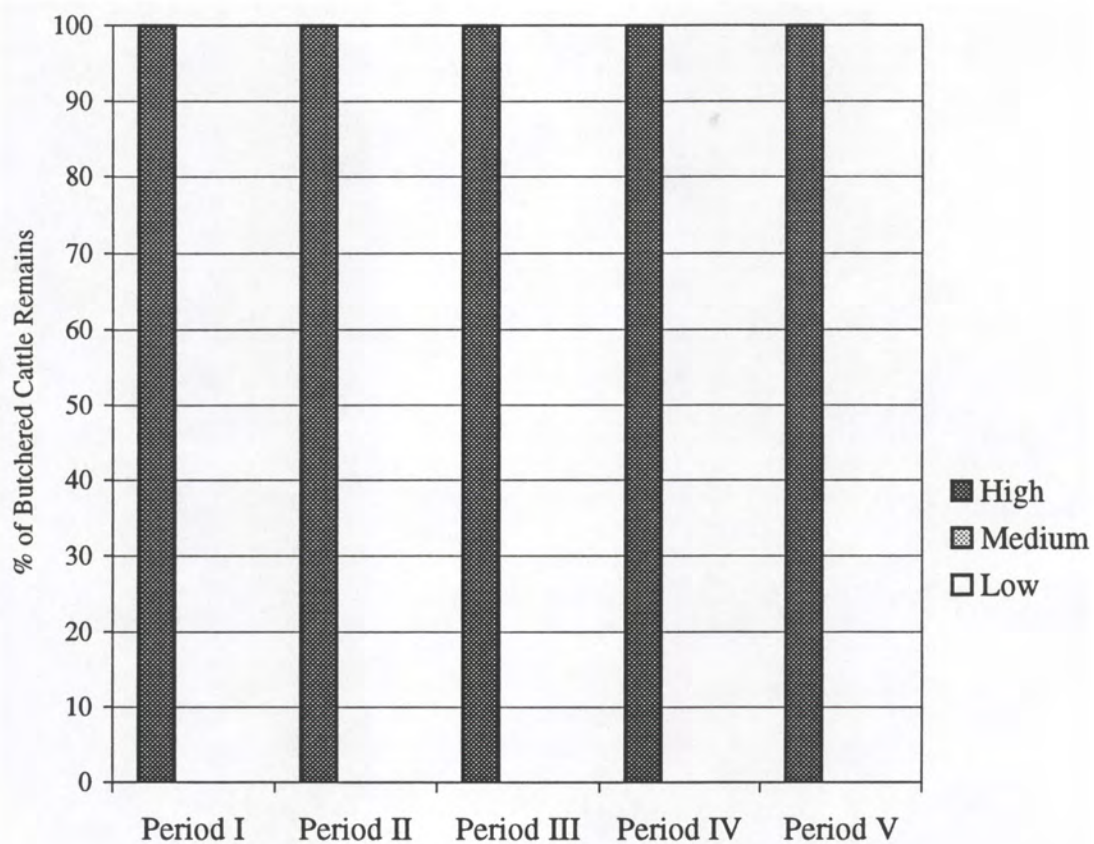


Figure 4.7: Percentages of High, Medium, and Low Meat Yield Beef Cuts at the Ramsey House Site

Table 4.12: Element Distribution for Cattle Remains in Each Occupation Period at the Ramsey House Site

Element/Group	I	II	III	IV	V
Cranial Fragments					
Mandibular Fragments					
Isolated Teeth	5	2	6	4	1
Cervical Vertebrae					
Thoracic Vertebrae					
Lumbar Vertebrae					
Caudal Vertebrae					
Indeterminate Vertebrae		1			
Ribs		3	5	10	10
Scapula					
Pelvis			2		
Humerus					
Radius	2				
Ulna					
Femur		6			
Tibia					
Fibula					
Carpals/Tarsals	3	1			
Metapodials					
Phalanges	3	2	2		1
Totals	13	15	15	14	11

* Column values are NISP values of identified elements

of meat production was occurring. Data that are available for cattle indicate that animals less than two and a half years were the most heavily utilized (Figure 4.8).

Discussion

Species utilization at the Ramsey House was focused on domestic mammals. Pigs and cattle make up 89 to 93 % of the species identified in all occupation periods. In Periods I and II, domestic species represent 94 and 96 % of the identified species. This percentage drops to 91 % in Period III, the era when the house and property go out of Ramsey control. However, in Periods IV and V this figure rises again. Wild species are utilized from 4 to 9 % within each period. In Periods I and II, wild species represent 6 and 4 % of the identified species. During these early periods, it is interesting to note that wild species do not account for more of the diet, as in the later periods. In Period I, the period of initial settlement, wild species represent only 6 % of the total. This may indicate that the Ramsey family was not in need of additional dietary subsistence beyond domestic species. Perhaps frontier living was not as rough as previously thought. Figure 4.9 and Table 4.13 show percentages of domestic versus wild species utilization through time.

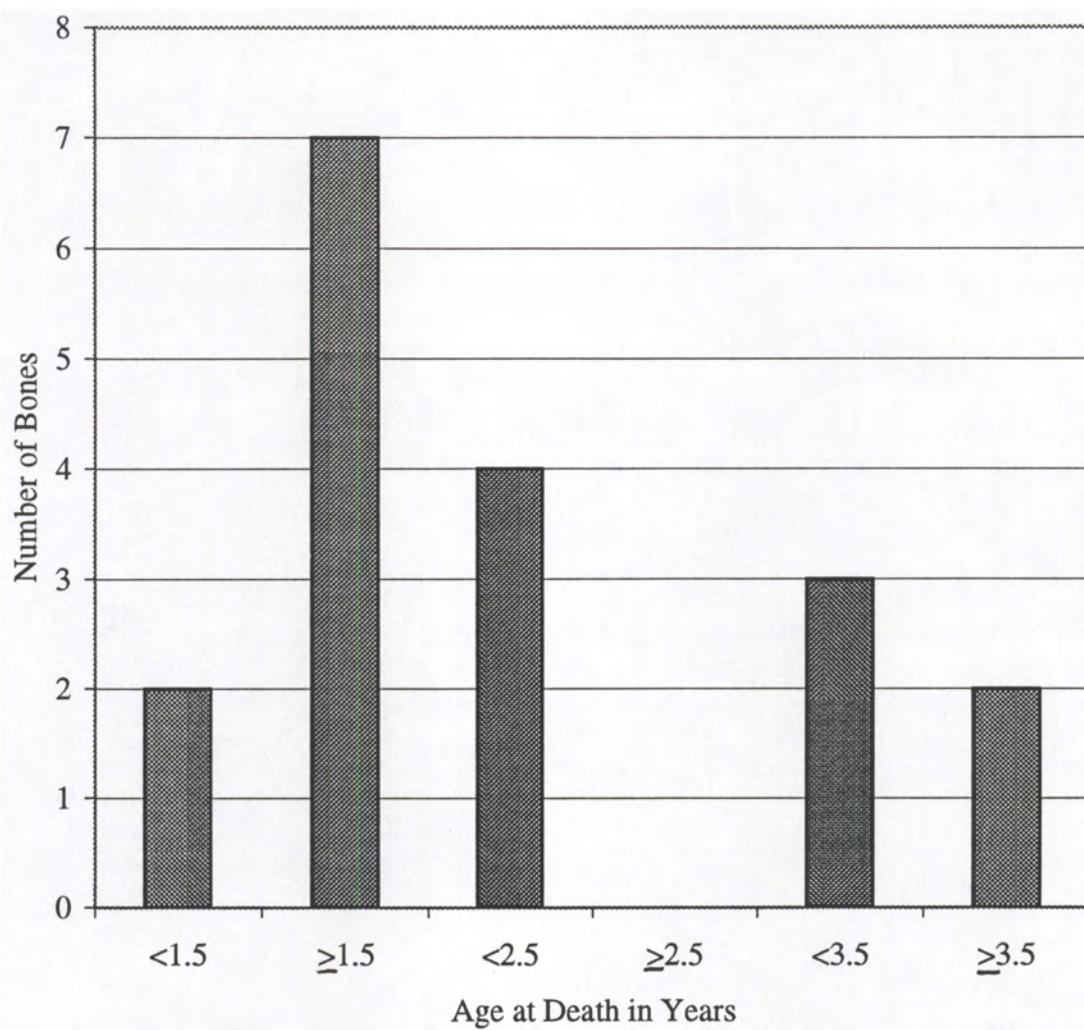


Figure 4.8: Cattle Mortality Profile Based on NISP for the Ramsey House Site

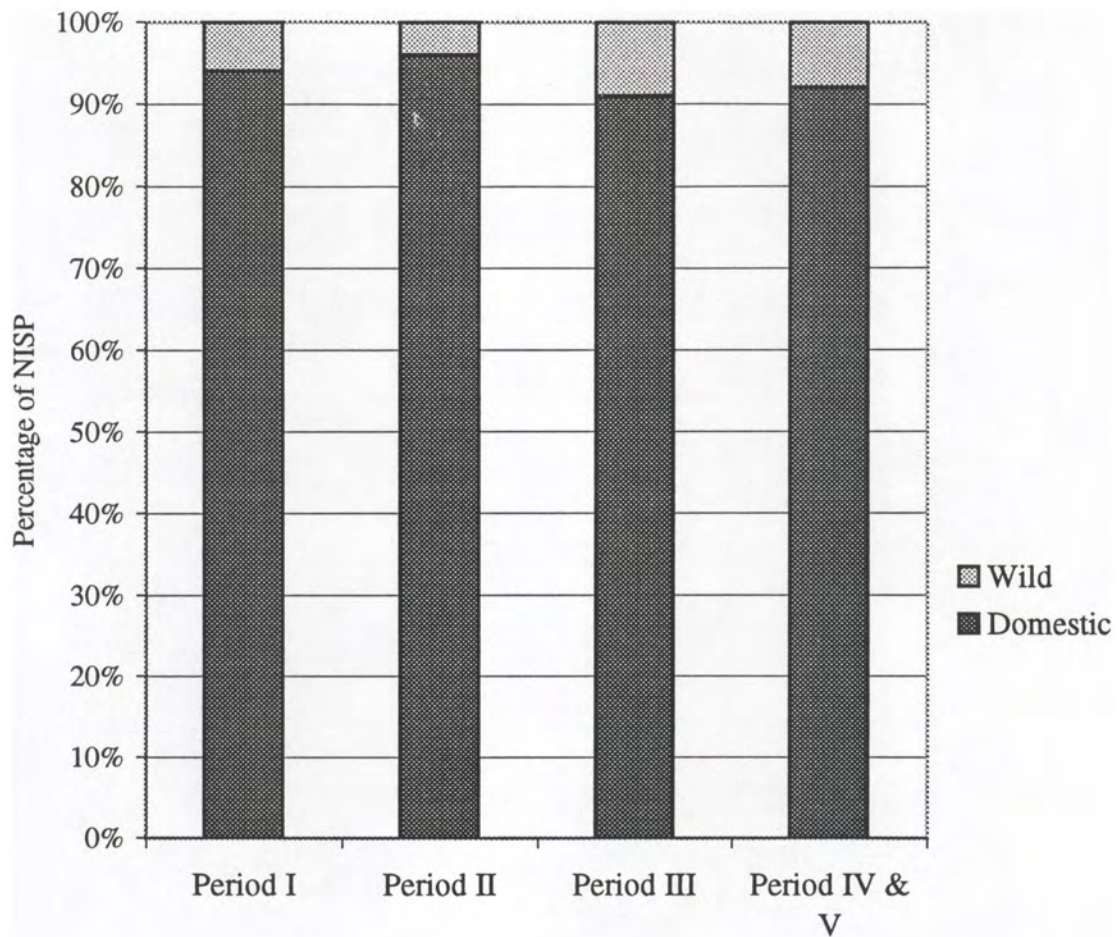


Figure 4.9: Domestic Versus Wild Taxa Utilization at the Ramsey House Site

Table 4.13: Percentage of Domestic Versus Wild Taxa Represented at the Ramsey House Site

Period	Domestic	Wild
Period I	93%	7%
Period II	90%	10%
Period III	89%	11%
Period IV & V	92%	8%

As a methodological exercise, MNI values were calculated for each Period and compared with those for the entire site. Site aggregation methods are issues that Grayson (1984) identifies with MNI. In his example using Connley Cave No.4 and Hidden Cave fauna, he illustrates, as one moves from calculating MNI based on the entire site, to MNI by stratum, and finally MNI by 10 cm level, how the MNI values increase (Grayson 1984:34-49). As one moves from a more agglomerative approach (MNI_{site}) of aggregation to a more divisive approach (MNI_{10cm}), the resulting values of MNI change as well. These effects reinforce the attitude that MNI is a poor choice for measuring taxonomic diversity. However, if one is sure of the contexts from which the faunal materials come, i.e. the occupation Periods at the Ramsey House, it may be reasonable to assume the MNI values calculated within each Period as a more realistic representation of the species identified. Table 4.14 shows MNI values for the entire Ramsey assemblage as well as for specific periods. MNI values increase for all species except horse, squirrel, and chicken. Reasons for this are directly related to their presence in dated contexts. The increasing MNI values for other species is explained by the fact that MNI measures aggregation methods as well as taxonomic diversity (Grayson 1984:49). It is apparent from Grayson's (1984) interpretations that the problem of element interdependence associated with NISP is the lesser of two evils when compared to the aggregation problem of MNI.

Table 4.14: MNI Comparisons Between Occupation Periods and the Entire Assemblage at the Ramsey House Site

Species	Common Name	MNI _{Site}	MNI _{Period}
MAMMALS			
<i>Sus scrofa</i>	domestic pig	3	7
<i>Bos taurus</i>	domestic cattle	1	4
Caprine	domestic sheep/goat	1	2
<i>Sylvilagus floridanus</i>	eastern cottontail	3	6
<i>Sciurus carolinensis</i>	gray squirrel	1	1
<i>O. virginianus</i>	white-tailed deer	1	2
<i>Sigmodon hispidus</i>	hispid cotton rat	1	2
BIRDS			
<i>Gallus gallus</i>	domestic chicken	1	2
FISHES			
<i>A.grunniens</i>	freshwater drum	2	3
Totals		14*	29

* Identified Mollusks were not included in this total

Butchery evidence shows pigs as being raised on the farm throughout each period with high, medium, and low meat yielding cuts being eaten. A home production and consumption model utilizing young animals of prime weight and finish is indicated by the butchery data. Cattle butchery is somewhat different. Throughout all periods high yield cuts in the form of ribs are utilized most. Element distribution shows few head and lower leg elements which would indicate home butchery and consumption. Smaller portions were most likely being brought onto the site in the form of short rib cuts or roasts.

Chapter 5

Comparison of the Ramsey Assemblage to Other Historic Assemblages in Tennessee

Several sites in Tennessee are used for comparisons with the Ramsey faunal assemblage. The Gibbs House, occupied from the late 18th century to the early 20th century, is an Upland South yeoman farmstead located in Knox County, Tennessee (Lev-Tov 1994). The Mabry Site, also in Knox County, is an Upper South plantation setting with both planter and slave deposits dating from the 1830s to the 1860s (Young 1993). Blount Mansion is an urban farmstead located in downtown Knoxville with a midden and slave deposits dating from the 1790s to 1830 (Coxe 1998). The original owner was Governor William Blount, an early political and historic figure in Knoxville and Tennessee.

Several sites located in Middle Tennessee are also used for comparisons. The Wynnewood State Historic Site, originally a farmstead and health resort, is located in Sumner County and dates to the mid 19th century (Breitburg 1983a). The Gowen Farmstead is a late 18th to mid 19th century small to medium sized plantation located in Davidson County (Breitburg 1993). In the later period of occupation, Gowen was the

location of the Tennessee Hospital for the Insane. The Drennon Site, also a farmstead in Davidson County, contains a series of frontier era features dating from the 1790s to the 1830s (Patterson 1997). Two deposits at the mid 19th century Westview Plantation in Williamson County used in comparisons come from a privy, dating from 1850 to 1880, and a slave cabin, dating from 1830 to 1865 (Patterson 1998).

Additionally, two military sites located in East Tennessee are used in the comparisons. The first is British Fort Loudon (Breitburg 1983b), a mid- 18th century fort and trading post along the Tennessee River in Monroe County. The other military fort is Southwest Point (Bunch 1993) located in Roane County, Tennessee. This fort was constructed in 1792 to initially protect white settlers, but later was used to protect Native Americans from white settlers.

Initial comparisons are concerned with mammal, bird, and fish utilization at these Tennessee sites. Mammals were the most prevalent species identified on all sites (see Figure 5.1 and Table 5.1), with birds and fish following in abundance. Percentage of NISP for mammals ranged from 78% to 97%. The Middle Tennessee sites, Drennon, Gowen, and Wynnewood, all contain approximately 90% or more mammal remains. The military sites, forts Southwest Point and Loudon, similarly contain mainly mammals. The East Tennessee sites, Ramsey, Gibbs, Blount, and Mabry, show the most diversity in

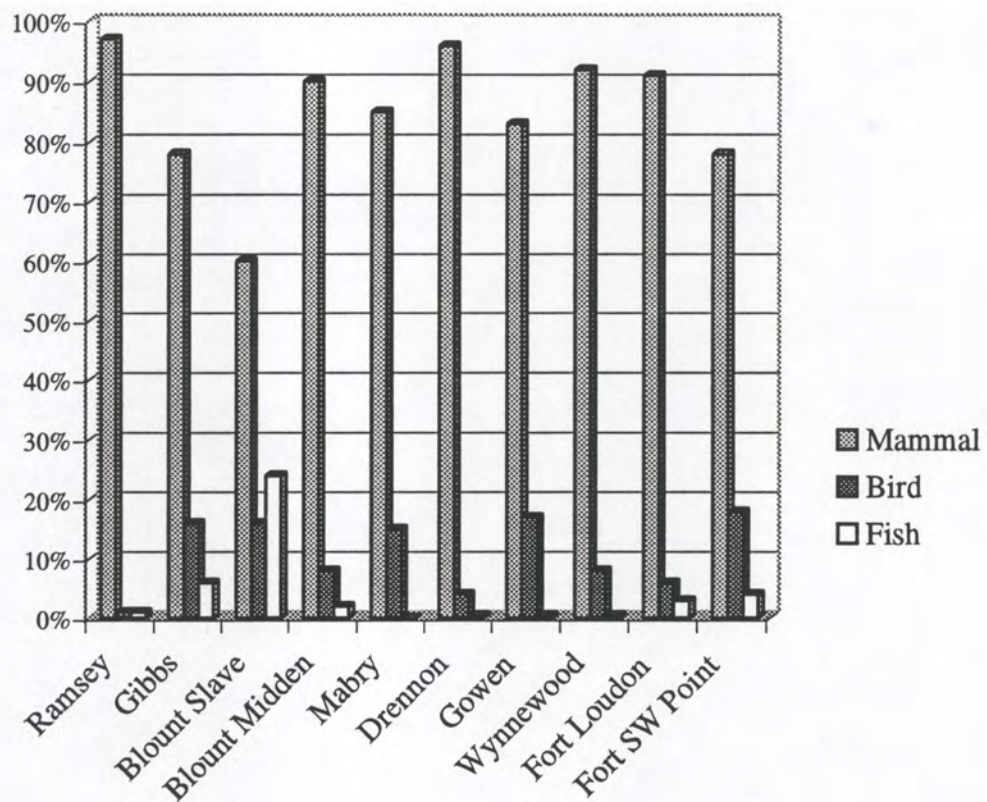


Figure 5.1: Mammal, Bird, and Fish Taxa Representation at Historic Sites in Tennessee

Table 5.1 : Percentage of Mammal, Bird, and Fish Taxa Represented on Historic Sites in Tennessee

Site	Mammal	Bird	Fish
Ramsey	97%	1%	1%
Gibbs	78%	16%	6%
Blount Slave	60%	16%	24%
Blount Midden	90%	8%	2%
Mabry	85%	15%	0%
Drennon	96%	4%	0%
Gowen	83%	17%	0%
Wynnewood	92%	8%	0%
Fort Loudon	91%	6%	3%
Fort Southwest Point	78%	18%	4%

mammal species representation. The Ramsey assemblage has the highest percentage of mammal remains and the lowest percentage of bird and fish remains when compared to other sites. It is possible that the low percentage of mammal usage in the Blount Slave deposit is related to the occupants of this particular area of the site, if these slaves were supplementing their diet with wild taxa because of a small ration of domestic meat. It is also interesting to note that this deposit had a higher percentage of fish usage when compared to other sites. The large quantity of fish remains may also reflect Blount Mansion's location on the Tennessee River in Knoxville. The Mabry slave contexts had a higher mammal percentage (85%) than Blount, but the bird usage was comparable. The Gibbs site has the lowest mammal percentage of the non-slave contexts (78%) in East Tennessee and the highest bird and fish percentages (16% and 6%).

A further comparison of domestic versus wild taxa shows a trend toward a heavy reliance on domestic species. Domestic taxa comprise 71% to 96% of the taxa identified at each site (see Figure 5.2 and Table 5.2). Higher percentages of wild taxa were found in the Gibbs, Blount Slave and Midden, Mabry, and Fort Southwest Point deposits. However, it appears that domestic species provided the most important source of food. Perhaps wild taxa were used as a supplement to the diet to break the monotony of pork or beef dishes. The Ramsey assemblage shows a similar trend of a high reliance on domestic taxa, well within the ranges of other sites in Tennessee.

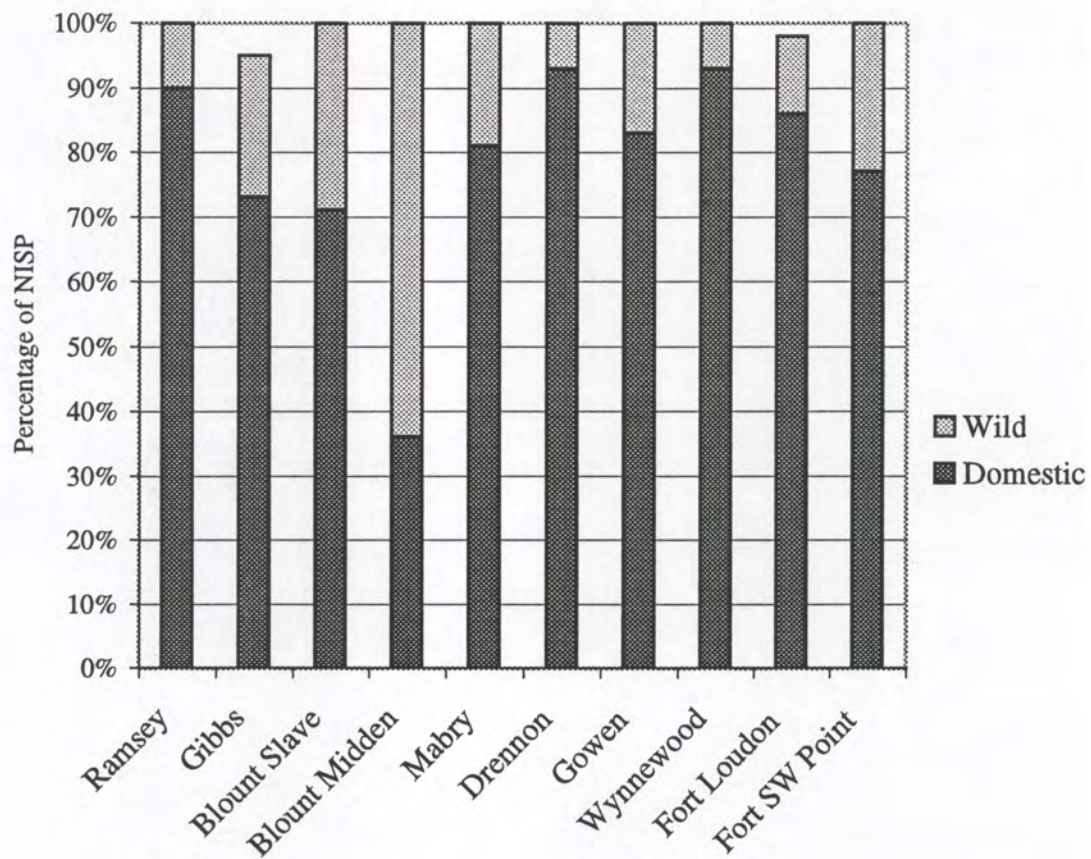


Figure 5.2: Domestic Versus Wild Taxa Usage at Historic Sites in Tennessee

Table 5.2 : Percentage of Domestic Versus Wild Taxa Represented on Historic Sites in Tennessee

Site	Domestic Taxa	Native Taxa
Ramsey	90%	10%
Gibbs	70%	30%
Blount Slave	71%	29%
Blount Midden	96%	4%
Mabry	81%	19%
Drennon	93%	7%
Gowen	83%	17%
Wynnewood	93%	7%
Fort Loudon	86%	12%
Fort Southwest Point	77%	23%

Another comparison was attempted with these Tennessee historic sites. Data concerning recorded butchering marks on pig and cattle remains were analyzed to see if any trends were apparent as to when the technology used, particularly chopping versus sawing, changed or if there was any technological preference in the Midsouth through time. General time periods were constructed and percentages of chopped and sawn pig bone were recorded for each site within each time frame (see Figures 5.3 and 5.4). From the plots, it appears that chopping technology is the favored method in early periods from 1790 to 1850, especially on farmsteads such as the Gibbs Site and the Gowen Farmstead. Chopping is the primary method used in the early period of the Ramsey House; however, its usage drops in the 1830s. At this time, 1830 to 1850, sawing increases and continues to be the favored technology used for disarticulating pig carcasses. The occupation of the Blount contexts span the period of 1790 to 1850, and within this time frame sawing is used in addition to chopping. Sawing is more frequent in the midden context than in the slave context. The proximity of the Blount Mansion to a local butcher shop could be reflected in these remains (Coxe 1998). The availability of professionally butchered meat is a factor to be considered when trying to identify trends in butchering technology. Whether sawing occurred on the farm or was an indication of purchased cuts of meat is

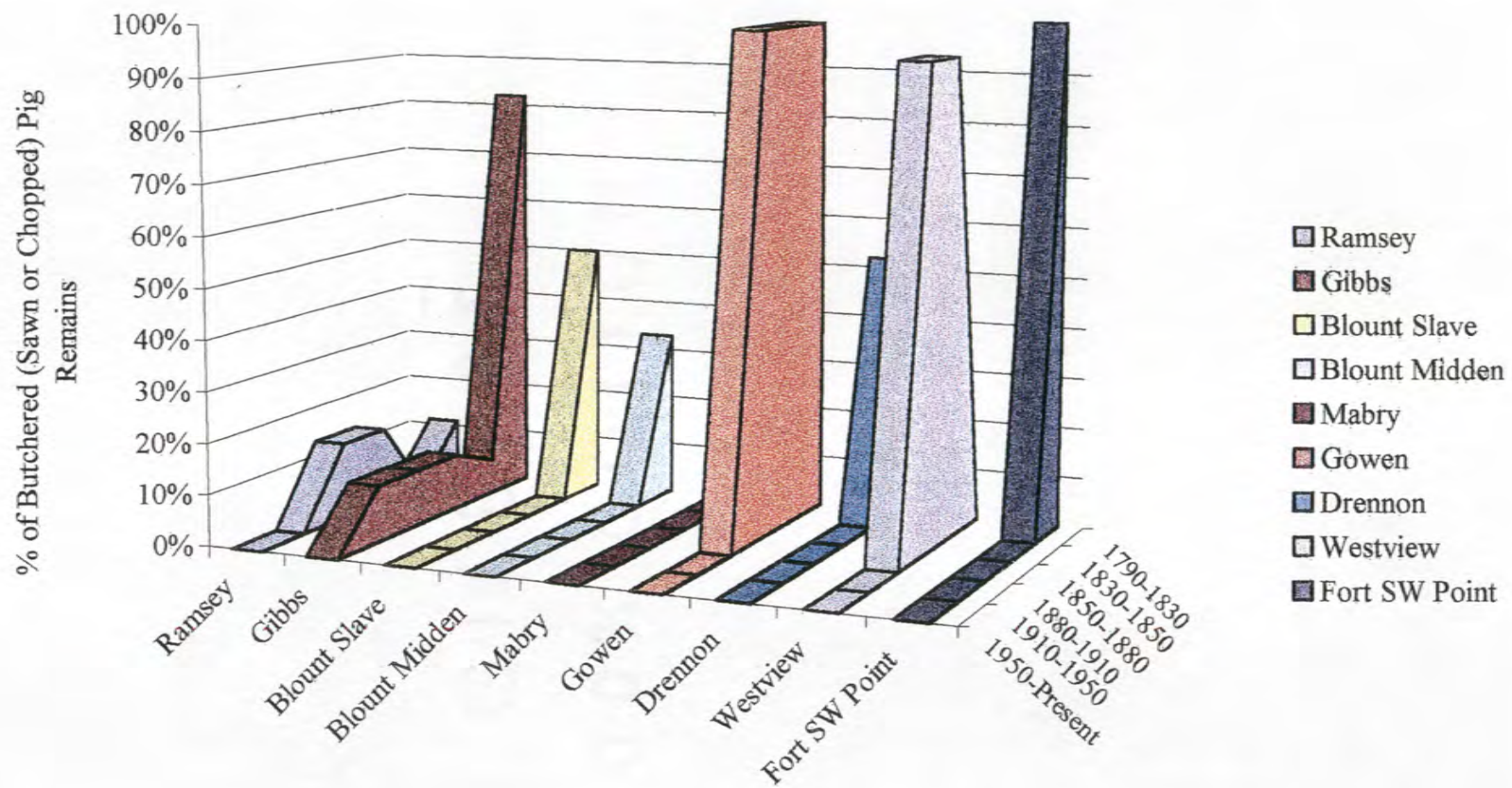


Figure 5.3: Percentage of Chopped Pig Bone on Historic Sites in Tennessee

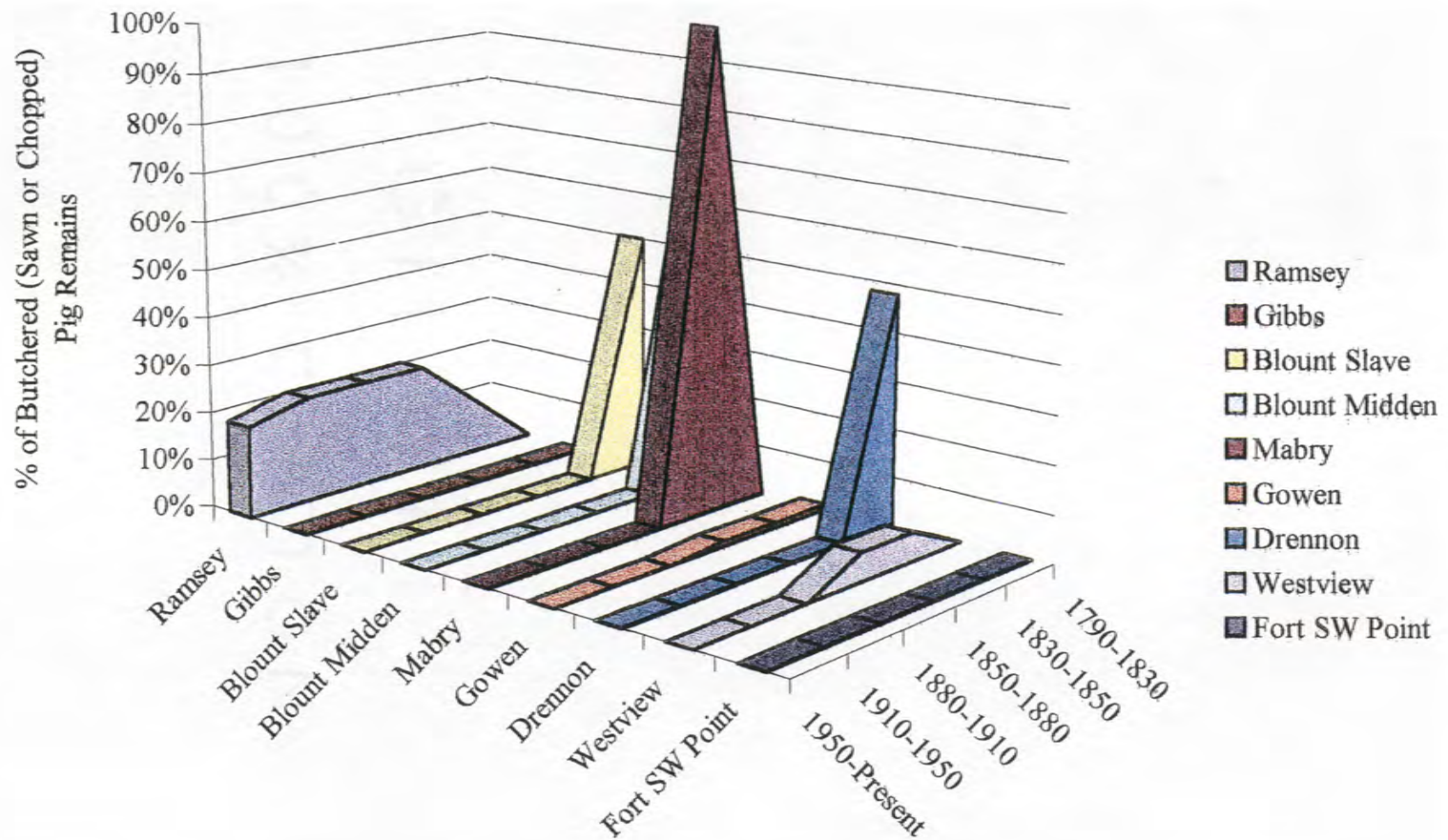


Figure 5.4: Percentage of Sawn Pig Bone on Historic Sites in Tennessee

unknown. The choice the consumer makes to purchase a piece of meat from a butcher is influenced by many factors, with financial ability being one of them. It is likely that the Ramseys and the Blounts were able to purchase meat from a butcher or utilize their services.

The results from butchery marks on cattle is even more telling for the Ramseys. A majority of the early butchered cattle remains are sawn, possibly indicating commercially prepared cuts. The Blount Slave context shows a high percentage of chopped bone, while the South Midden context has an equal amount of chopped and sawn cattle bone. The Gibbs farmstead shows a consistent use of a chopping technology for dismembering carcasses. Figures 5.5 and 5.6 graphically represent the percentages of chopped and sawn cattle remains at sites in Tennessee. Again it seems that chopping was the preferred technology in early periods with sawing becoming more frequent around 1830 to 1850. It is interesting that in the early periods sawing is used at six of the nine sites used in the comparison.

According to Deetz (1977), the change from a chopping technology, primarily concerned with cutting up a carcass, to a sawing based technology, used for preparing smaller portions, occurred in the late 18th century and is a function of the Georgian mindset of symmetrical ordering. It is possible that the use of saws in preparing meat

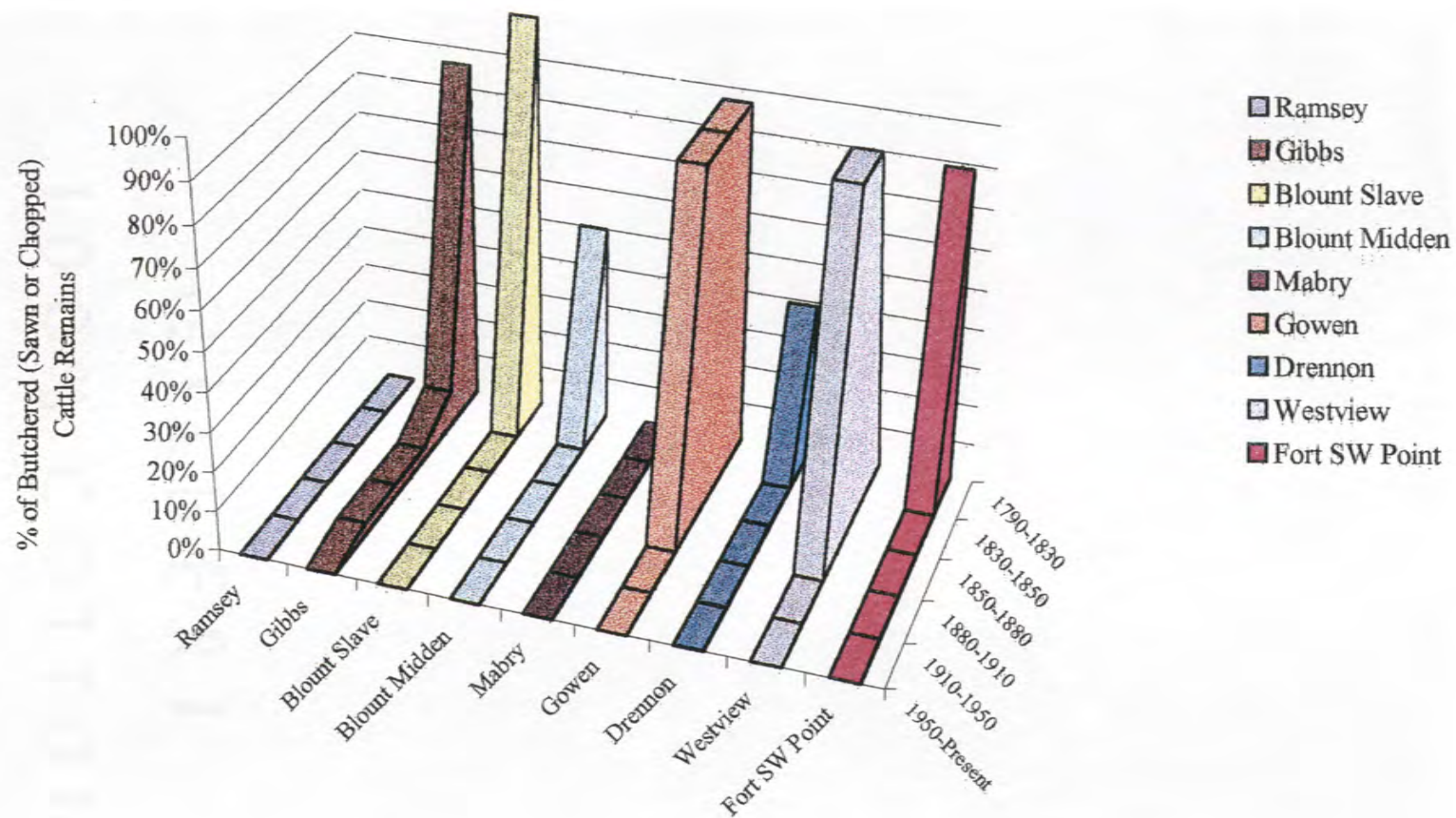


Figure 5.5: Percentage of Chopped Cattle Bone in Historic Assemblages in Tennessee

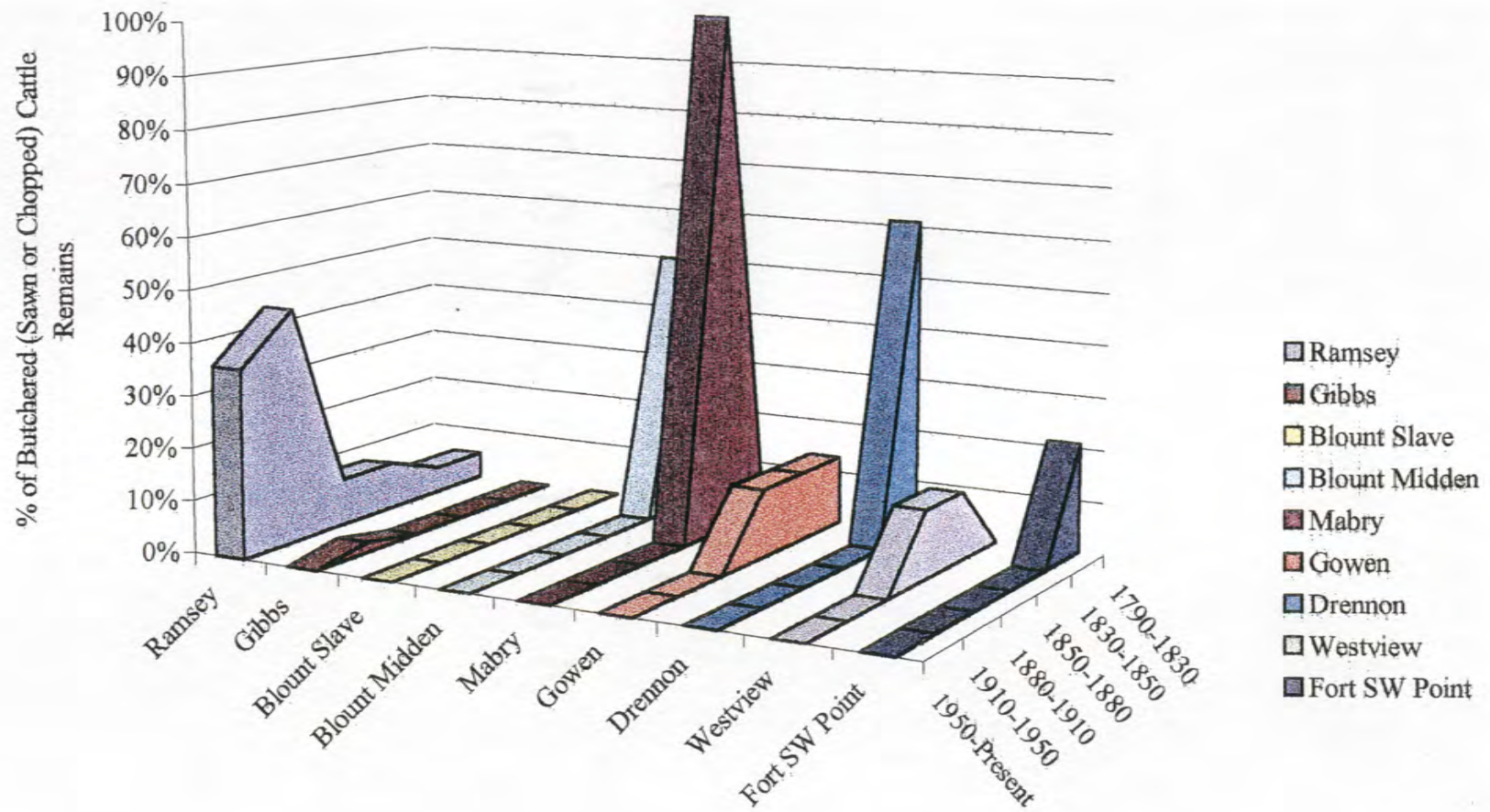


Figure 5.6: Percentage of Sawn Cattle Bone in Historic Assemblages in Tennessee

cuts was a reflection of the times and the Ramsey family was a participant in this trend.

The spread of this technology and its usage may have to do with the location of the site.

For example, the use of saws does not occur until late in the Gibbs occupation, perhaps indicating a more rural nature of the site and its inhabitants.

Chapter 6

Biometrical Analysis for the Ramsey Assemblage

Biomass Estimation

The Ramsey assemblage had seven cattle phalanges that were measurable to use for biomass estimation. However, none of these were the third phalange, the best element for this purpose based on my research (see Table 2.7 and 2.8 for regression equations and R^2 results for all phalanges). One first phalange and six second phalanges were identified from the Ramsey assemblage. Further research on utility indices for domestic species is needed to be able to proceed from total live weight to actual biomass. Regression equations obtained from the known sample of cattle phalanges (Table 6.1) were applied to phalanges from the Ramsey assemblage. Based on the R^2 results for the first phalange, three measurements provided good results: 1) all measurements (greatest length, proximal breadth, or distal breadth), 2) greatest length and proximal breadth, and 3) proximal breadth and distal breadth. The same situation occurs for the second phalanges, all the measurements (greatest length, proximal breadth, and distal breadth), greatest length and proximal breadth, and proximal breadth and distal breadth provide an R^2 value of 0.63.

Table 6.1: Regression Statistics for Identified Cattle Phalanges From the Ramsey Assemblage

Phalange	R ²	Measurements Used	Regression Equation
1 st Phalange	.71	All (P3, P4, P5)	$Y = -1.259473 + 6.452003E-03(1.826075) + 2.626522(1.477121) + (-1.440678E-03)(1.45485)$
	.71	P3 and P4	$Y = -1.252734 + (-1.52063E-03)(1.826075) + 2.617673(1.477121)$
	.71	P4 and P5	$Y = -1.25149 + 2.62879(1.477121) + (-1.430779E-02)(1.45485)$
2 nd Phalange			
1	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.557507) + 0.5528731(1.439333) + 1.987813(1.363612)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.557507) + 2.707932(1.439333)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.439333) + 1.857123(1.363612)$
2 nd Phalange			
2	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.4843) + 0.5528731(1.372912) + 1.987813(1.338456)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.4843) + 2.707932(1.372912)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.372912) + 1.857123(1.338456)$

Table 6.1 (Continued)

Phalange	R ²	Measurements Used	Regression Equation
2 nd Phalange			
3	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.565848) + 0.5528731(1.475671) + 1.987813(1.357935)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.565848) + 2.707932(1.475671)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.475671) + 1.857123(1.357935)$
2 nd Phalange			
4	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.509203) + 0.5528731(1.376577) + 1.987813(1.326336)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.509203) + 2.707932(1.376577)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.376577) + 1.857123(1.326336)$
2 nd Phalange			
5	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.488551) + 0.5528731(1.450249) + 1.987813(1.359835)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.488551) + 2.707932(1.450249)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.450249) + 0.857123(1.359835)$

Table 6.1 (Continued)

Phalange	R ²	Measurements Used	Regression Equation
2 nd Phalange			
6	.63	All (P6, P7, P8)	$Y = 0.1633635 + (-0.7251593)(1.513218) + 0.5528731(1.376577) + 1.987813(1.212188)$
	.63	P6 and P7	$Y = -1.068696 + (-0.1917752)(1.513218) + 2.707932(1.376577)$
	.63	P7 and P8	$Y = -0.3759893 + 0.2561972(1.376577) + 1.857123(1.212188)$

This may prove beneficial in an archaeological setting where one measurement may not be possible to obtain. The discriminant function application classified the phalanges as all being from the front leg. The classification rate for the first phalange was 99.1 percent. This means that based on discriminate functions derived from the known database, there is a 99.1% chance that this phalange is correctly classified as being from the front leg. The classification rate for the second phalanges was 94.7 percent. These also were determined to be carpal 2nd phalanges. The classification rate for each phalange is shown in Table 6.2.

Based on the classification as front phalanges, Table 6.1 shows the regression equations indicated by each of the measurements used to estimate total live weight. The estimates do have the potential of being valuable resources to estimate size of domestic species. Table 6.3 shows the weight estimates determined from the regression equations. Weight estimates for the 1st phalange range from 336.81 kg (740.98 lb) to 426.49 kg (938.28 lb). The average weight estimated from the measurements is 390.46 kg (859.01 lb). The weight estimates for the second phalanges range from 168.99 kg (371.78 lb) to 423.67 kg (932.14 lb), with the average for all the 2nd phalanges being 302.3 kg (665.06 lb).

Table 6.2: Classification Rates For Cattle Phalanges From the Ramsey Assemblage

Phalange	Classification	Classification Rate
1 st Phalange	1*	100.0 %
2 nd Phalange:		
1	1*	88.3 %
2	1*	69.2 %
3	1*	92.1 %
4	1*	78.1 %
5	1*	68.9 %
6	1*	94.1 %

* 1 = Front

Table 6.3: Animal Weight Estimates Based on Recovered Cattle Phalanges from the Ramsey House Site

Phalange		Measurement Used	Weight Estimate
1 st		All (P3, P4, P5)	426.49 kg
		P3 and P4	336.81 kg
		P4 and P5	408.07 kg
2 nd :	1	All (P6, P7, P8)	346.97 kg
		P6 and P7	339.0 kg
		P7 and P8	335.09 kg
2 nd :	2	All (P6, P7, P8)	321.11 kg
		P6 and P7	231.42 kg
		P7 and P8	289.35 kg
2 nd :	3	All (P6, P7, P8)	349.18 kg
		P6 and P7	423.67 kg
		P7 and P8	334.14 kg
2 nd :	4	All (P6, P7, P8)	292.77 kg
		P6 and P7	234.18 kg
		P7 and P8	275.33 kg
2 nd :	5	All (P6, P7, P8)	388.00 kg
		P6 and P7	374.12 kg
		P7 and P8	331.85 kg
2 nd :	6	All (P6, P7, P8)	172.47 kg
		P6 and P7	233.77 kg
		P7 and P8	168.99 kg

A potential benefit of using this database of regression equations is the use of only one particular species to estimate the total live weight. Reitz and Cordier (1983) use a formula for lateral astragalus length based on a sample size of seven animals: four dogs, an opossum, and a squirrel. Their formula for femur head depth has more observations; however, the species used were not identified. Reitz et al. (1987) state that although more general formulae are acceptable because allometry is a growth function and an evolutionary function, one should not use an equation for an animal not included in the original database or beyond the range of X and Y values. Reitz and Cordier (1983:239) state “An adequate artiodactyl database is urgently needed in order to make comparisons of higher resolution resolving this situation”. Perhaps this research is an advance toward providing insights to factors influencing human subsistence and the nutritional value of domestic species within the diet.

Metrical Determination of Sex

Another morphometric analysis was attempted with the known database of cattle phalange measurements. The goal was to develop discriminant analysis scores that allowed the separation of sex based on linear measurements using SAS discriminant function procedures (SAS Institute 1989). A subset from the database was separated out

that consisted of 22 known sex third phalange measurements. Because these initial measurements had p-codes distinguishing medial from lateral phalanges, each phalange was counted as representing a separate individual. It is recognized that this does not represent an independent sample. The measurements used for the third phalange were diagonal length, length of the dorsal surface, and the breadth of the middle of the third phalange (see Figure 2.1). A total of four functions was determined: 1) all measurements used, 2) dorsal surface length and breadth of the middle of the phalange, 3) diagonal length and dorsal surface length, and 4) diagonal length and breadth of the middle of the phalange.

Initial classification (resubstitution) rates for females ranged from 72.00 % to 88.00 %, and classification rates for males ranged from 75.00 % to 85.71 % based on the three measurements. A jackknife classification (cross-validation), a technique where the observation being classified is not included in the classification procedure, was also run. The jackknife classification is often used because it approximates a real life situation more than the initial classification where the observation is used to classify itself. Classification rates for females in the jackknife classification ranged from 72.00 % to 84.00 %, and for males the rates ranged from 73.21 % to 85.71 % (Table 6.4).

Table 6.4: Resubstitution and Cross Validation Classification Rates for the Third Phalange Discriminant Functions

Variables Used	Initial Classification		Jackknife Classification	
	Female	Male	Female	Male
All	88.00	83.93	84.00	83.93
Dorsal Length and Breadth	84.00	85.71	84.00	85.71
Dorsal Length and Diagonal Length	88.00	82.14	88.00	82.14
Diagonal Length and Breadth	72.00	75.00	72.00	73.21

Another 'unknown' test sample, containing 20 males and 20 females, was derived from this subset for a classification test of the discriminant functions. A total of three males was incorrectly classified as females with all functions. Two males were misclassified based on one discriminant function (both diagonal/breadth), and one male was misclassified based on three discriminant functions. Eight females were misclassified with all the functions, possibly due to fewer females in the sample. In this case, if one function was wrong, all the others were as well. The usefulness of this methodology in an archaeological setting has been proven in the literature, mainly by those practicing zooarchaeology in Europe, using domestic species (Howard 1963; Jewell 1963; Higham 1968; Higham and Message 1969; Grant 1971, 1975; Bourdillion and Coy 1977; Maltby 1979, 1981; Grigson 1982; Bartosiewicz 1984, 1988, and 1993; Wiig 1985; Crabtree 1989). The ability to distinguish between the sexes of cattle (i.e. bulls, steers, and cows) and other domestic species can facilitate interpretations regarding husbandry practices in an archaeological faunal assemblage.

Chapter 7

Summary and Conclusions

The goal of this thesis was to characterize the diet of the occupants of the Ramsey House as indicated by the faunal remains identified from excavations. It was possible to compare species identified and their relative abundance for five occupational periods that were defined by ownership of this Upland South plantation. The Ramsey faunal assemblage was then compared to other faunal assemblages from historic sites in East and Middle Tennessee, ranging from yeoman and frontier farmsteads, urban and rural plantation contexts, and military forts.

Overall, the Ramsey assemblage is dominated by mammal remains, particularly those of domestic mammals. Pig and cattle are the main meat sources for the diet, contributing 67 % and 25 %, respectively. Domestic chicken represents less than 1 % of the identified assemblage. Native mammals and fish are poorly represented.

Specifically, Period I contexts are dominated by pig and cattle remains, which represent 92 % of the identifiable species in this period (Table 7.1). Native taxa occur in very small numbers. A similar taxa composition is found in Period II. Pig and cattle, as well as domestic chicken, were the main contributors to the meat diet. It is possible the

Table 7.1: Percentages of Species Represented at the Ramsey House Site for All Occupation Periods Based on NISP

Species	Common Name	Period I	Period II	Period III	Period IV&V
<i>Sus scrofa</i>	domestic pig	72.06	77.24	75.33	51.35
<i>Bos taurus</i>	domestic cattle	20.59	10.34	10.00	40.54
Caprine	domestic sheep/goat	0	trace	trace	0
<i>S.carolinensis</i>	gray squirrel	0	0	0	2.70
<i>S.floridanus</i>	eastern cottontail	0	2.07	6.00	5.41
<i>O.virginianus</i>	white-tailed deer	1.47	0	trace	0
<i>S.hispidus</i>	hispid cotton rat	1.47	0	trace	0
<i>Gallus gallus</i>	domestic chicken	0	1.38	2.67	0
<i>A.grunniens</i>	freshwater drum	2.94	1.38	1.33	0

scarce representation of native taxa in these early periods is related to the Ramsey family utilizing the market economy; possibly they were self-sufficient, and the need to supplement their meat diet with native animals was not necessary. The later periods of occupation also follow the pattern of heavy reliance on domestic taxa. Overall, the time specific periods show the Ramsey occupants diet was dominated by terrestrial animals, primarily domestic mammals. Native taxa are represented, but they apparently did not contribute much to the diet.

Butchered pig remains represented 46 % of all butchered bone. Butchering marks occurred most often on axial and head elements. Sawing was the most common mark identified, with chopping the next abundant mark. The earliest period is characterized by a chopping technology; however, one piece of sawn bone indicates the services of a butcher were used or a competing technology on the farm.

It is possible that commercial butchers were utilized by the earliest occupants of the Ramsey plantation, as the first butchers were in business as early as 1794 in Knoxville. The presence of commercial butchers in this frontier town indicated a need for markets to sell surplus livestock and acquire meat. This is understandable as Knoxville was a major point in the hog and cattle drover's route to the Atlantic seaboard as well as a crossroads for trade occurring with larger cities to the East and South.

In the later periods of occupation, butchering of pigs was accomplished with a sawing technology and retail cuts of meat were identified. The presence of primary butchery waste indicates that home butchering was occurring.

Butchering evidence indicates that chopping was the preferred method of disarticulating pig carcasses. After 1830, sawing was used more frequently. Home butchering was likely practiced as evidenced by a large number of isolated pig teeth. The Ramsey occupants had access to all cuts from the high, medium, and low meat yielding areas of the carcass. There was an increase through time for high yield cuts with a sharp drop in the final period of occupation. Medium cut usage fluctuates through time and low yield cuts are most prevalent in Period II. If the status of the Ramsey House occupants decreased through time, meat yields based on cuts does not support this trend in the historic record. Equal utilization of high and medium yield cuts is hard to interpret, but may indicate a difference in the producing economy of the farm.

Further evidence for home butchery is indicated by element distributions. Butchery waste is found in all periods and a lack of high yielding upper leg and fore/hind shanks may indicate the selling off of hams, roasts, and picnic hams to market. This practice occurred on larger farms after the needs of the family were met (Winters 1996).

Butchered cattle remains comprise 54 % of all butchered remains identified for domestic species. Sawing was most often used and axial elements exhibited alteration

most frequently. Middle rib and short rib cuts used for stews and roasts were most abundant. All butchered meat cuts fall into the high yield category.

In all occupation periods, there is an absence of cranial fragments except for isolated teeth. Since some metapodials and phalanges were recovered, these likely indicate that cattle were present on site. Axial and leg fragments are more numerous than cranial, thus indicating that home butchering of cattle was not being practiced. It is unlikely that entire carcasses were being processed and consumed, but rather smaller portions of beef carcasses (roasts, steak cuts, and ribs) were purchased elsewhere and brought to the Ramsey home.

Comparing the Ramsey assemblage with other historic faunal assemblages in Tennessee revealed that mammal remains were most prevalent on all sites. A heavy reliance on domestic taxa, mainly pig, was apparent. Wild taxa were present on all sites as well; however, it is likely they were used as a supplement to the diet or used to break the monotony of a pork-dominated meat diet. The utilization of birds and fish occurred, but in limited numbers. An analysis of butchery technology from the historic sites indicates chopping was used more frequently in the early periods to dismember pig carcasses. Around 1830 to 1850, chopping gives way to sawing as the preferred method of butchering. Whether this is related to the utilization of meat markets or a different technology on the site is unknown. The pattern is similar for cattle dismemberment on

these sites. Chopping is preferred early on, giving way around 1830 to 1850 to sawing. It is interesting to note that of the nine sites compared, six had sawing of cattle remains in the earliest periods (1790-1850).

Biometrical analysis of the Ramsey assemblage included estimating total live weights based on seven recovered cattle phalanges. Weight estimates from a 1st phalange ranged from approximately 337 kg (741 lb) to 426 kg (938 lb), with an average estimated weight of 390 kg (859 lb). Weight estimates for 2nd phalanges ranged from 169 kg (372 lb) to 424 kg (932 lb), with an average estimated weight of 302 kg (665 lb). While these weights may be underestimated based on the respective regression equations, the ability to estimate live weight is accomplished using an equation based on one particular species, something not accomplished previously for domestic mammals. Research by others has also demonstrated it is possible to distinguish between sexes of domestic cattle, thus facilitating future attempts to interpret husbandry practices in an archaeological faunal assemblage.

In general, the Ramsey House faunal assemblage reflects a diet focused on domestic mammals, where pigs and cattle represent 89 to 93 % of species identified in all occupation periods. Wild taxa, while present, only contributed 7 to 11 % of the diet during the occupation periods of the house. The low percentage of wild taxa in the early periods indicates the frontier life in early Knoxville was not as rugged as might be

expected and may reveal the Ramsey's ability to subsist solely on domestic meat sources.

Butchering of pigs was occurring on site with access to all cuts of meat represented.

Cattle butchery was not likely occurring on site and smaller, higher yielding, retail cuts of meat were being brought onto the site for consumption.

The question of how substantial the market influence was in early Knoxville needs to be further investigated. What products were available from these markets and the relative prices may lead to stronger conclusions about status and access to commodities utilized in the diet. Future research should focus on locating documentary evidence about early markets and the interaction of early inhabitants within this market system in the Upland South region. Correlating this documentary evidence with the growing list of Upland South faunal assemblages should provide a picture of early Knoxville as a burgeoning town on the frontier that functioned as an extension of larger markets on the Atlantic coast and to the south in New Orleans.

REFERENCES

REFERENCES

- Aldrich, Paul I. (editor)
1922 *The Packers' Encyclopedia: Blue Book of the American Meat Packing and Allied Industries*. The National Provisioner, Chicago.
- Alvey, Richard A.
1997 Consumerism on the Tennessee Frontier. Unpublished Master's Thesis. Department of Anthropology, Texas Tech University, Lubbock.
- Andrews, Susan C., and Amy L. Young
1992 Plantations on the Periphery of the Old South: Modeling a New Approach. *Tennessee Anthropologist* 17:1-12.
- Bartosiewicz, Laslo
1984 Reconstruction of Prehistoric Cattle Represented By Astragali in a Bronze Age "Sacrificial Pit." In *Animals in Archaeology: 4. Husbandry In Europe*, edited by C. Grigson and J. Clutton-Brock, pp. 67-80. BAR International Series 227, Oxford.

1988 Biometrics at an Early Medieval Butchering Site in Hungary. In *Science and Archaeology: Glasgow 1987*, edited by E. A. Slater and J. O. Tate, pp. 361-367. BAR British Series 196 (ii), Oxford.

1993 Beast of Burden from a Classical Road Station in Bulgaria. In *Archaeozoology of the Near East*, edited by H. Buitenhuis and A. T. Clason, pp. 105-109. Universal Book Services, Leiden.
- Bourdillion, Jennifer and Jennie Coy
1977 The Animal Bones. In *Excavations at Melbourne Street, Southampton, 1971-1976*, edited by P. Holdsworth, pp. 79-121. Council for British Archaeology, Southampton Archaeological Research Committee.
- Bowen, Joanne
1992 Faunal Remains and Urban Subsistence in New England. In *The Art and Mystery of Historical Archaeology*, edited by A. B. Yentsch and M. C. Beaudry, pp. 267-281. CRC Press, Boca Raton.
- Branstner, Mark and Terrence Martin
1987 Working-Class Detroit: Late Victorian Consumer Choices and Status. In *Consumer Choice in Historical Archaeology*, edited by S. Spencer-Wood, pp. 301-320. Plenum, New York.

Breitburg, Emanuel

- 1983a 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. *Tennessee Anthropologist* 8(2):182-199.
- 1983b Bone Discardment and Meat Procurement Strategies at British Fort Loudon (Tennessee), 1756-1760. Unpublished Master's Thesis. Vanderbilt University, Nashville.
- 1991 Verification and Reliability of NISP and MNI Methods of Quantifying Taxonomic Abundance: A View from Historic Site Zooarchaeology. In *Beamers, Bobwhites, and Blue-Points: Tributes to the Career of Paul W. Parmalee*, edited by J. R. Purdue, W. E. Klippel, and B. W. Styles, pp. 154-162. Illinois State Museum Scientific Papers Vol. 23. Illinois State Museum, Springfield.
- 1992 Appendix 2: Faunal Remains from Site 40DV401. Report Prepared for Metropolitan Nashville Airport Authority and Division of Archaeology, Tennessee Department of Conservation. In *The Gowen Farmstead: Archaeological Data Recovery at Site 40DV401 (Area D), Davidson County, Tennessee*, edited by G. Weaver, et al., pp. 390-414. Garrow and Associates, Inc, Atlanta.

Bull, Sleeter

- 1951 *Meat For the Table*. McGraw-Hill, New York.

Bunch, Robyn L.

- 1993 Fort Southwest Point Vertebrate and Invertebrate Faunal Remains. In *Fort Southwest Point Archaeological Site, Kingston, Tennessee: A Multidisciplinary Interpretation*, edited by S. D. Smith, pp. 403-465. Tennessee Department of Environment and Conservation, Division of Archaeology, Research Series No.9, Nashville.

Burnett, Edmund C.

- 1946 Hog Raising and Hog Driving in the Region of the French Broad River. *Agricultural History* 20:86-103.

Carnes, Linda F. and Jefferson Chapman

- 1984 An Assessment of the Potential for Archaeological Resources at the Ramsey House Property. Report Submitted to the Association for the Preservation of Tennessee Antiquities, Knoxville Chapter. Department of Anthropology, University of Tennessee, Knoxville.

Casteel, Richard W.

- 1978 The 'Weigemethod' of Weight Method as Applied to Archaeological Faunal Analysis. *Journal of Field Archaeology* 5:71-77.

Coxe, Carey L.

- 1998 Urban Slave Diet in Early Knoxville: Faunal Remains From Blount Mansion, Knoxville, Tennessee. Unpublished Master's Thesis. University of Tennessee, Knoxville, Department of Anthropology.

Crabtree, Pam J.

- 1989 West Stow, Suffolk: Early Anglo-Saxon Animal Husbandry. *East Anglian Archaeology*. Report No. 47, Suffolk.
- 1990 Zooarchaeology and Complex Societies: Some Uses of Faunal Analysis for the Study of Trade, Social Status, and Ethnicity. In *Archaeological Method and Theory*, edited by M. B. Schiffer, pp. 155-205. University of Arizona Press, Tucson.

Crader, Diana C.

- 1984 The Zooarchaeology of the Storehouse and Dry Well at Monticello. *American Antiquity* 49:542-558.

Deetz, James

- 1977 *In Small Things Forgotten: The Archaeology of Early American Life*. Doubleday, New York.

Dottrens, Emile

- 1946 1. Etude Preliminaire: Les Phalanges Osseuses de *Bos taurus domesticus*. *Revue Suisse de Zoologie* 53:739-774.

Duffield, Lathel F.

- 1973 Aging and Sexing the Post-Cranial Skeleton of Bison. *Plains Anthropologist* 18(60):132-139.

Edwards, Allen L.

- 1976 *An Introduction to Linear Regression and Correlation*. W.H. Freeman and Co., San Francisco.

Emerson, Thomas E.

- 1978 A New Method for Calculating the Live-Weight of the Northern White-Tailed Deer from Osteoarchaeological Material. *Mid-Continental Journal of Archaeology* 3:35-44.

Empel, W. and T. Roskosz

- 1963 Das Skellet der Gliedmassen des Wisents, *Bison bonasus* (Linnaeus 1758). *Acta Theriologica* 7(13):259-297.

Faulkner, Charles H.

- 1986 *A History of the Ramsey House and Its Occupants, 1797-1952*.
Department of Anthropology, University of Tennessee, Knoxville.
- 1988 *Archaeological Testing at the Nicholas Gibbs House: Season I*. Report
Prepared for the Nicholas Gibbs Historical Society.
- 1989 *Archaeological Testing at the Nicholas Gibbs House: Season II*. Report
Prepared for the Nicholas Gibbs Historical Society.
- 1990 *Archaeological Testing at the Nicholas Gibbs House: Season III*. Report
Prepared for the Nicholas Gibbs Historical Society.
- 1995 *Archaeological Testing at the Ramsey House: Fall 1994*. Report Prepared
for Tennessee Historical Commission and Association for the Preservation
of Tennessee Antiquities, Knoxville Chapter. Department of
Anthropology, University of Tennessee, Knoxville.
- 1996 *Archaeological Excavations at Ramsey House: 1995 Season*. Report
Prepared for Tennessee Historical Commission and Association for the
Preservation of Tennessee Antiquities, Knoxville Chapter. Department of
Anthropology, University of Tennessee, Knoxville.

Garrow, Patrick H.

- 1987 The Use of Converging Lines of Evidence for Determining Socioeconomic
Status. In *Consumer Choice in Historical Archaeology*, edited by S.
Spencer-Wood, pp. 217-231. Plenum, New York.

Gibb, James G.

- 1996 *The Archaeology of Wealth: Consumer Behavior in English America*.
Plenum, New York.

Gould, Stephen J.

- 1966 Allometry and Size in Ontogeny and Phylogeny. *Biological Review of the
Cambridge Philosophical Society* 41:587-640.

Grant, Annie

- 1971 The Animal Bones. In *Excavations at Fishbourne 1961-1969*, edited by B.
W. Cunliffe, pp. 377-388. Society of Antiquaries, London.

- 1975 The Animal Bones. In *Excavations at Portchester Castle. I; Roman*, edited by B. W. Cunliffe, pp. 378-408. Society of Antiquaries, London.
- Gray, Lewis C.
 1933 *History of Agriculture in the Southern United States to 1860, Volume II*. Carnegie Institute of Washington, Washington, D.C.
- Grayson, Donald K.
 1979 On the Quantification of Vertebrate Archaeofaunas. In *Advances in Archaeological Methods and Theory*, Vol. 2, edited by M. B. Schiffer, pp. 200-238. Academic Press, New York.
- 1984 *Quantitative Zooarchaeology*. Academic Press, New York.
- Grigson, Caroline
 1982 Sex and Age Determination of Some Bones and Teeth of Domestic Cattle: A Review of the Literature. In *Ageing and Sexing Animal Bones From Archaeological Sites*, edited by B. Wilson, C. Grigson, and S. Payne, pp. 7-24. BAR British Series 109, Oxford.
- Gust, Sherri M.
 1983 Problems and Prospects in Nineteenth Century California Zooarchaeology. In *Forgotten Places and Things: Archaeological Perspectives on American History*, edited by A. E. Ward, pp. 341-348. Contributions to Anthropological Studies No. 3. Center for Anthropological Studies, Albuquerque.
- Hesseltine, William B. (editor)
 1954 *Dr. J.G.M. Ramsey: Autobiography and Letters*. Tennessee Historical Commission, Nashville.
- Higham, C.F.W.
 1968 The Metrical Attributes of Two Samples of Modern Bovine Bones. *Journal of Zoology* 157:63-74.
- Higham, C. F. W. and M. A. Message
 1969 An Assessment of a Prehistoric Technique of Bovine Husbandry. In *Science in Archaeology*, edited by D. Brothwell and E. Higgs, 2nd edition, pp. 315-330. Thames and Hudson, London.
- Hilliard, Samuel B.
 1969 Pork and the Ante-Bellum South: The Geography of Self-Sufficiency. *Annals of the Association of American Geographers* 59(3):461-480.

- 1972 *Hog Meat and Hoecake: Food Supply in the Old South, 1840-1860*. Southern Illinois University Press, Carbondale.
- 1988 Hog Meat and Cornpone: Foodways in the Antebellum South. In *Material Life in America, 1600-1860*, edited by R. B. St. George, pp. 311-322. Northeastern University Press, Boston.
- Howard, Margaret
- 1963 The Metrical Determination of the Metapodials and Skulls of Cattle. In *Man and Cattle*, edited by A. E. Maurant and F. E. Zeuner, pp. 91-101. Royal Anthropological Institute Occasional Paper 18.
- Huelsbeck, David R.
- 1991 Faunal Remains and Consumer Behavior: What *Is* Being Measured? *Historical Archaeology* 25:62-76.
- Imlay, Gilbert
- 1968 *A Topographical Description of the Western Territory of North America*. Reprint of 1797 edition. Johnson Reprint Company, New York.
- Jackson, H. Edwin
- 1989 The Trouble with Transformations: Effects of Sample Size and Sample Composition on Meat Weight Estimates Based on Skeletal Mass Allometry. *Journal of Archaeological Science* 16:601-610.
- Jewell, Peter
- 1963 Cattle From British Archaeological Sites. In *Man and Cattle*, edited by A. E. Maurant and F. E. Zeuner, pp. 80-91. Royal Anthropological Institute Occasional Paper 18.
- Jolley, Robert L.
- 1983 North American Historic Sites Zooarchaeology. *Historical Archaeology* 17:64-79.
- Jordan, Terry G., and Matti Kaups
- 1989 *The American Backwoods Frontier: An Ethnic and Ecological Interpretation*. Johns Hopkins University Press, Baltimore.
- Klein, Richard G. and Kathryn Cruz-Uribe
- 1984 *The Analysis of Animal Bones from Archaeological Sites*. University of Chicago Press, Chicago.

- Klippel, Walter E., and Darcy F. Morey
 1986 Contextual and Nutritional Analysis of Freshwater Gastropods from Middle Archaic Deposits at the Hayes Site, Middle Tennessee. *American Antiquity* 51:799-813.
- Knoxville Gazette*
 1794 16 May 1794.
- Levie, Albert
 1970 *The Meat Handbook*, 3rd edition. The Avi Publishing Company, Westport, CT.
- Lev-Tov, Justin S. E.
 1994 Continuity and Change in Upland South Subsistence Practices: The Gibbs House Site in Knox County, Tennessee. Unpublished Master's Thesis. Department of Anthropology, University of Tennessee, Knoxville.
- Lyman, R. Lee
 1979 Available Meat from Faunal Remains. *American Antiquity* 44:536-545.
 1987 On Zooarchaeological Measures of Socioeconomic Position and Cost-Efficient Meat Purchases. *Historical Archaeology* 21:58-66.
- Maltby, Mark
 1979 Faunal Studies on Urban Sites: The Animal Bones from Exeter 1971-1975. *Exeter Archaeology Reports* 9.
 1981 Iron Age, Romano-British, and Anglo-Saxon Animal Husbandry: A Review. In *The Environment of Man: The Iron Age to the Anglo-Saxon Period*, edited by M. Jones and G. Dimbleby, pp. 155-203. BAR Report 87, Oxford.
- McMahon, Thomas A.
 1975 Allometry and Biomechanics: Limb Bones in Adult Ungulates. *The American Naturalist* 109:547-563.
- Morey, Darcy F., Walter E. Klippel, and Bruce L. Manzano
 1991 Estimation of Live Weight of Fish Recovered From Archaeological Sites. In *Beamers, Bobwhites, and Blue-Points: Tributes to the Career of Paul W. Parmalee*, edited by J. R. Purdue, W. E. Klippel, and B. W. Styles, pp. 91-98. Illinois State Museum Scientific Papers, Vol. 23. Illinois State Museum, Springfield.

NCSS (Jerry L. Hintze)

- 1997 *NCSS User's Guide- I*. Number Cruncher Statistical Systems, Kaysville, UT.

Noddle, Barbara A.

- 1973 Determination of the Body Weight of Cattle from Bone Measurements. In *Domestikationsforschung und Geschichte der Haustiere*, edited by J. Matolcsi, pp. 377-389. Akademiai Kiado, Budapest.
- 1974 A Comparison of the Animal Bones from 8 Medieval Sites in Southern Britain. In *Archaeozoological Studies*, edited by A. Clason, pp. 248-260. North Holland, Amsterdam.

O'Steen, Lisa D.

- 1986 Chapter VIII. Faunal Analysis. In *Oxon Hill Manor Archaeological Site Mitigation Project, Volume 2*, edited by P. H. Garrow and T. R. Wheaton, pp. 555-562. Maryland Department of Transportation, State Highway Administration.

Parmalee, Paul W.

- 1960 Vertebrate Remains from Fort Loudon, Tennessee. *Tennessee Archaeological Society, Miscellaneous Paper* 6:26-29.
- 1973 Appendix A- Animal Remains From Netherland Inn, Kingsport, Tennessee. In *Archaeological Investigations: Netherland Inn Complex, Season I, 1973*, edited by J. L. Benthall, pp. 81-86. Tennessee Historical Commission and Netherland Inn Association, Inc.

Patrick, James

- 1981 *Architecture in Tennessee, 1768-1897*. University of Tennessee Press, Knoxville.

Patterson, Judith A.

- 1997 Faunal Remains at the Drennon Site (40DV447). Report Submitted to the University of Tennessee Transportation Center.
- 1998 Faunal Remains From the Westview Plantation (40WM178), in Williamson County, Tennessee. Report Submitted to the University of Tennessee Transportation Center.

Pedley, T.

- 1977 *Scale Effects in Animal Locomotion*. Academic Press, New York.

Polhemus, Richard

- 1977 *Archaeological Investigation of the Tellico Blockhouse Site (40MR50): A Federal Military and Trade Complex*. Report of Investigations No. 26, Department of Anthropology, University of Tennessee, Knoxville, and Tennessee Valley Authority Publications in Anthropology No. 16.

Prange, Henry D., John F. Anderson, and Hermann Rahn

- 1979 Scaling of Skeletal Mass to Body Mass in Birds and Mammals. *The American Naturalist* 113:103-122.

Purdue, James R.

- 1987 Estimation of Body Weight of White-Tailed Deer (*Odocoileus virginianus*) from Bone Size. *Journal of Ethnobiology* 7:1-12.

Reitz, Elizabeth J.

- 1985 Comparison of Spanish and Aboriginal Subsistence on the Atlantic Coastal Plain. *Southeastern Archaeology* 4:41-50.
- 1987 Vertebrate Fauna and Socioeconomic Status. In *Consumer Choice in Historical Archaeology*, edited by S. Spencer-Wood, pp. 101-119. Plenum, New York.
- 1991 Animal Use and Culture Change in Spanish Florida. In *Animal Use and Culture Change*, edited by K. Ryan, and P. Crabtree. MASCA Research Papers in Science and Archaeology Vol. 8, Philadelphia.
- 1992 The Spanish Colonial Experience and Domestic Animals. *Historical Archaeology* 26:84-91.
- 1994 Zooarchaeological Analysis of a Free African Community: Gracia Real de Santa Teresa de Mose. *Historical Archaeology* 28:23-40.

Reitz, Elizabeth J., and Dan Cordier

- 1983 Use of Allometry in Zooarchaeological Analysis. In *Animals and Archaeology: 2. Shell Middens, Fishes, and Birds*, edited by C. Grigson, and J. Clutton-Brock, pp. 237-252. BAR International Series 183, London.

Reitz, Elizabeth J., and Nicholas Honerkamp

- 1983 British Colonial Subsistence Strategy on the Southeastern Coastal Plain. *Historical Archaeology* 17:4-26.

Reitz, Elizabeth J., and Irvy R. Quitmeyer

- 1988 Faunal Remains from Two Coastal Georgia Swift Creek Sites.

Southeastern Archaeology 7:95-108.

- Reitz, E. J., I. R. Quitmeyer, H. S. Hale, S. J. Scudder, and E. S. Wing
1987 Application of Allometry to Zooarchaeology. *American Antiquity* 52:304-317.
- Reitz, Elizabeth J., and Barbara Ruff
1994 Morphometric Data for Cattle from North America and the Caribbean Prior to the 1850's. *Journal of Archaeological Science* 21:699-713.
- Reitz, Elizabeth J., and C. Margaret Scarry
1985 *Reconstructing Historic Subsistence with an Example from Sixteenth-Century Spanish Florida*. Special Publication Series Vol. 3. Society for Historical Archaeology.
- Ringrose, T.
1993 Bone Counts and Statistics: A Critique. *Journal of Archaeological Science* 20:121-157.
- Roberts, Wayne D.
1986 *Archaeological Excavations at the Historic Ramsey House, Knox County, Tennessee: Summer 1985*. Report Prepared for the Association for the Preservation of Tennessee Antiquities, Knoxville Chapter. Department of Anthropology, University of Tennessee, Knoxville.
- Rogers, William F.
1929 Life in East Tennessee Near End of Eighteenth Century. *East Tennessee Historical Society Publications* 1:32-35.
- SAS Institute
1988 *SAS Users Guide*. SAS Institute Inc., Cary, NC.
- Schmidt-Nielsen, Knut
1984 *Scaling: Why is Animal Size So Important?* Cambridge University Press, Cambridge.
- Schmitt, Dave and Charles Zeier
1993 Not By Bones Alone: Exploring Household Consumption and Socioeconomic Status in an Isolated Historic Mining Town. *Historical Archaeology* 27(4):20-38.
- Shepard, S.M.
1974 *The Hog in America*. Reprint of 1896 edition. Scholarly Resources, Wilmington, DE.

Shulz, Peter D.

- 1979 Historical Faunal Remains from Panamint City: Notes on Diet and Status in a California Boom Town. *Pacific Coast Archaeological Society Quarterly* 15(4):55-63.

Shulz, Peter D., and Sherri M. Gust

- 1983a Faunal Remains and Social Status in 19th Century Sacramento. *Historical Archaeology* 17:44-52.

- 1983b Relative Beef Cut Prices in the Late Nineteenth Century: A Note for Historic Sites Faunal Analysts. *Pacific Coast Archaeological Society Quarterly* 19(1):12-18.

Singer, David A.

- 1985 The Use of Fish Remains as a Socioeconomic Measure: An Example from 19th Century New England. *Historical Archaeology* 19:110-113.
- 1987 Threshold of Affordability: Assessing Fish Remains for Socioeconomics. In *Consumer Choice in Historical Archaeology*, edited by S. Spencer-Wood, pp. 85-99. Plenum, New York.

Silver, Ian A.

- 1969 The Ageing of Domestic Animals. In *Science and Archaeology*, edited by D. Brothwell and E. Higgs, 2nd edition, pp. 283-302. Thames and Hudson, London.

Smith, J. Gray

- 1974 *A Brief Historical, Statistical and Descriptive Review of East Tennessee, United States of America*. Reprint of 1842 edition. The Reprint Co., Spartanburg.

Smith, Richard J.

- 1980 Rethinking Allometry. *Journal of Theoretical Biology* 87:97-111.
- 1984 Allometric Scaling in Comparative Biology: Problems of Concept and Method. *American Journal of Physiology* 246:R152-R160.

Stewart, Frances and Peter Stahl

- 1977 Cautionary Note on Edible Meat Poundage Figures. *American Antiquity* 42:267-270.

- Tomhave, William H.
1925 *Meat and Meat Products*. J.B. Lippincott, Co., Philadelphia.
- Von Den Driesch, Angela
1976 *A Guide to the Measurement of Animal Bones from Archaeological Sites*. Peabody Museum Bulletin No. 1, Harvard University, Cambridge, MA.
- Wapnish, Paula and Brian Hesse
1988 Urbanization and the Organization of Animal Production at Tell Jemmeh in the Middle Bronze Age Levant. *Journal of Near Eastern Studies* 47:81-94.
- White, Theodore E.
1953 A Method of Calculating the Dietary Percentage of Various Food Animals Utilized by Aboriginal Peoples. *American Antiquity* 18:393-399.
- Wiig, O.
1985 Sexing of Subfossil Cattle Metacarpals. *Acta Theriologica* 30(30):495-503.
- Wigginton, Eliot
1972 *The Foxfire Book*. Doubleday, New York.
- Wing, Elizabeth S., and Antoinette B. Brown
1979 *Paleonutrition: Method and Theory in Prehistoric Foodways*. Academic Press, New York.
- Winters, Donald L.
1996 *Tennessee Farming, Tennessee Farmers*. The University of Tennessee Press, Knoxville.
- Young, Amy Lynne
1994 Slave Subsistence at the Upper South Mabry Site, East Tennessee: Regional Variability in Plantation Diet of the Southeastern United States. Unpublished Master's Thesis. Department of Anthropology, University of Tennessee, Knoxville.
- Zeimens, George
1982 Analysis of Postcranial Bison Remains. In *The Agate Basin Site*, by G. C. Frison and D. J. Stanford, pp. 213-240. Academic Press, New York.

VITA

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