

ECONOMIC ANALYSIS OF BONE FROM SELECTED HISTORIC SITES

Lynne E. Christenson
Department of Anthropology
San Diego State University
San Diego, CA 92182-4443

ABSTRACT

Current historic archaeology theories emphasize consumer, ethnic and economic issues. This paper reports on research on animal bone remains from a variety of sites and demonstrates how historic zooarchaeology can add consumer, ethnic and economic results to site analysis. In addition, this research shows how rural versus urban faunal patterns can display behavioral deposition practices.

Introduction

Historic archaeology combines methods and theory from both history and archaeology (Pastron et al. 1990; Geismar and Janowitz 1993). In the case of historic zooarchaeology, data are based on the fish, animal, and bird bones excavated from the sites. These data are interpreted in conjunction with historic information about the site (Hattori and Kosta 1990; Rothschild and Balkwill 1993). Also utilized are period menus and recipes, newspaper advertisements, directories, letters, journals, and photographs. This combination allows for the development of information about the types of food eaten, processing methods, and consumer, economic and ethnic foodways.

The primary goal of historic faunal analysis is to accurately reconstruct dietary practices based on the animal, bird, and fish bones from the remains of what people ate. For example, meat acquired after it was butchered, boned and salted supplied no bone remains; however, meat acquired in retail or wholesale cuts resulted in an over-representation of certain cuts and no butchering waste (cranial or foot elements). A secondary goal for historic faunal analysis is to define ethnic association and/or economic practices of the people who ate the meat.

The part of the animal utilized for meat is indicated by the element present and this in turn can be used to infer butchering patterns, economic status or ethnicity (Reitz and Scarry 1985; Schulz and Gust 1983). For example, a preponderance of pig femur bones could indicate that the people preferred ham (a relatively expensive cut of meat), while many pig foot bones could indicate that the people ate pickled pigs feet, an inexpensive cut.

Not only the type of element but where and how it was butchered can provide information about meat preparation. Butchering methods for beef, lamb and pork have been relatively standard for the past 100 years (Cable et al. 1982; Schulz and Gust 1983). For example, saw cuts on bone produce smooth points of disarticulation, with bands of striation present on the outer bone, while cleaver marks leave ragged hack marks (Reitz and Scarry 1985:85). Meat cut from the

bone with a knife leaves small cut marks along the outer surface of the bone. Bone broken open for removal of marrow has distinctive, jagged edges and small flakes removed at the point of percussion.

Butchered bone can be related to culturally distinctive Chinese, Mexican and Euro-American butchering patterns (Langenwaller 1985). The Mexican butchering pattern was introduced to the present day southwestern United States with Spanish missionization, and continued until the twentieth century (Cheever 1983; Langenwaller 1988). In this method, the bone and meat were cut by cleavers, and very few bone-in cuts of meat were used. The bones and meat were boiled or stewed, resulting in bone that is fragmented, frequently porous from the cooking, and unidentifiable as to genus, species or element (Booher 1937). This type of cooking had several advantages. First, when meat was leaner than is common today, cooking the bone added marrow to the mixture and provided fat for satiety and taste. Meat was also tougher, and this form of cooking softened it as well as the corn and beans cooked with it (Bayless and Bayless 1987:21).

Euro-American butchering patterns were the only type noted in this analysis. The Euro-American method began in California in the middle nineteenth century and continues today (Langenwaller 1985). Cuts of meat from this method are produced generally by saw, but also may be from cleavers, and are the typical wholesale and retail cuts familiar to most. Hand saws were used until mechanical saws were introduced in the 1930s. Chinese foodways include animals different from either Euro-American or Mexican animals as well as different butchering patterns. No faunal evidence was found to suggest Chinese food or Chinese cooking.

Consumer issues relate to what people bought from a store or a catalog as opposed to what they raised or grew themselves. Consumer issues are particularly important in analysis of bird, fish, and animal remains (Schulz and Gust 1983). People who bought all of their food at a butcher shop or grocery store had limited options and thus follow an urban subsistence pattern, while those that buy little or no food at stores follow a rural pattern.

Methodology

Basic analytic goals include the identification of the animals represented in the collection, at the species level wherever possible. Information is also recorded where observable on alteration, faunal age, size, skeletal element, preservation, and circumstances of deposition. These data permit quantification of the species represented, and general characterization of the materials in each feature of the site. To identify and quantify the animal types represented in the collection, information is recorded on bone element, side, genus, and species. Identifiable alterations that are noted include signs of burning, butchering, or pathology.

Bone identification can be determined from comparative collection and bone atlases (Gilbert 1993; Olsen 1968, 1979, 1980; Brown and Gustafson 1979; Lawrence 1951; Sandefur 1977; Schmid 1972). General animal classes and size ranges (such as large mammal, small mammal, bird or fish) are noted; this information is particularly important for specimens too fragmentary to permit further identification to genus and species. Bird bones are distinguished by light weight, hollowness, and shiny outer surfaces. Fish bones are usually vertebral bodies (centra), with a distinctive funnel shape on the top and bottom; fish cranial bones are thin and distinctively shaped. Land mammals are grouped in three size categories: small mammal, ranging from the smallest rodent to jackrabbit and bobcat; medium, including pig, and sheep; and large, including cow and horse.

Burned bone is defined as any bone blackened from burning or white or gray from intense burning on any part of the bone. If the bone lacked any evidence of burning, it was identified as unburned.

The NISP (number of identified specimens) technique is used to quantify the collections and an economic index (revised from Bayham et al. 1982) is used to establish relative values of cuts of meat per species. Quantification and statistical analysis in zooarchaeology continue to be problematic (Grayson 1979, 1984; Binford 1981; Black 1987). No one method has wide appeal, much less universal appeal.

Results

The purpose of this paper is to report on research conducted to ascertain differences between urban consumerism of cuts of meat and rural patterns of meat use. The method utilized for this study is the economic index based on wholesale and retail cuts of meat (sirloin, ham, chops, etc). Results from faunal analysis on 6 urban sites, 4 rural sites, and 4 Mexican/California sites were compared. The results show distinctive differences between these three groups.

Wealth, social status and ethnicity have been shown to reflect a families' food preference, (Wing and Brown 1979; Booth 1971:93). Those with lower economic status have access to fewer food stuffs, while the wealthy have access to a great quantity and variety of imported or luxury foods. A menu from the 1895 Bay View Hotel in San Diego shows a variety of foods which includes lobster, oysters, veal, pork and lamb

chops, Russian caviar, and a variety of fruits and vegetables (SDHS menu file).

To provide an analysis of the bone recovered, an economic index was used (Bayham et al. 1982). Since the relative value of the various cuts of meat has not changed, data on the price per pound of retail cuts could be used to index the quality of the meat cuts. In other words, a sirloin steak costs more now than a hindshank cut, and it did so in 1900. A scale was devised for the various wholesale and retail cuts of meat based on the relative value for the mean price per pound of each butchering unit. The scales were then ranked with the lowest relative value assigned to the lower ranking members. All cuts of meat were ranked consecutively. The index demonstrates that the lower index numbers (closer to 1) represent cheaper cuts of meat (Table 1). People from lower economic households would preferentially buy these cuts, while higher economic households could afford the more expensive cuts.

Urban Sites

When this index was applied to six urban sites a distinctive pattern emerged. The Golden Eagle Hotel, an upper class Sacramento establishment, consistently had Euro-American patterns and higher quality cuts of meat in the deposit (Gust and Schulz 1980). This site had a high average index at 5.36. Remains included beef, pork, and lamb, in addition to chicken, turkey and some venison. The Home Avenue Projects were excavations of San Diego City's communal refuse deposit (Van Warner 1988). Between 1908 and 1913 the city decided that the usual practice of throwing garbage into old wells, privies or just out the door was no longer safe.

Table 1. Index of Meat Cuts.

Beef	Index
Long Rib	7.89
Short Rib	3.58
Round Steak	6.20
T-Bone	8.75
Rump	5.50
Brisket	4.00
Chuck	4.29
Hock Bones	2.44
Shoulder	4.29
Arm Pot Roast	4.29
Arm Chuck	4.29
Hind Shank	1.40
Pork	
Spare Rib	3.16
Ham	4.37
Ham Steak	4.37
Lamb	
Leg Of Lamb	3.76
Lamb Shank	3.96
Lamb Chop	8.67

All garbage was gathered in a horse drawn wagon and deposited where Home Avenue currently runs. Examination of the bone from this site over three different projects resulted in a uniform average index of 5.09. Only Euro-American butchering patterns were noted. Meat choices included beef, pork, and lamb, chicken, duck, and turkey. Fish were also an important source of food.

The Corona del Cajon Hotel was built in 1885 and burned in 1920. Historic and archaeological analysis on the remains from the hotel as well as the hotel manager's garbage areas showed a predominantly urban pattern (Van Wormer and Manley 1994). The bone indexes from the hotel deposits and the hotel managers deposits were similar but not identical. The hotel bone index was 4.9 while the hotel manager refuse was slightly lower at 4.85. Again, both had Euro-American butchering patterns. This indicates a medium economic index. While this was a small, newly formed town, it was rural in some respects. Included in the food refuse were wild fowl, rabbit, and venison. Beef predominated, but pork, lamb, chicken, and turkey were also eaten. Fish was found only in the hotel refuse, not the managers household.

The results from the privies of Phoenix in the early 1900's show a wider range of cuts, and the major emphasis was on medium quality cuts (Cable et al. 1982). Beef predominated but lamb and pork were included. The Edgewater site in Atlanta, Georgia was a seasonal dump, from one winter, where remains from Thanksgiving and Christmas meats predominated (Davidson 1982). It was determined to be from lower middle class suburban families, and it has the lowest economic index. No lamb was identified in the bone deposits, but chicken and turkey were. The Oyster Bar, located in Sacramento next to the Golden Eagle, had more medium quality cuts represented (Gust and Schulz 1980). Food for the jail was served from the Oyster Bar. Only Euro-American butchering was noted in all three sites.

This evidence shows that people in San Diego and at the Golden Eagle Hotel ate more expensive cuts of meat than did the people at the other four sites. The economic indices for each of the urban sites are compared in Figure 1. The Golden Eagle Hotel had the highest economic index at 5.39 while the Edgewater site had the lowest. These six sites date from the same period, are urban in location, and had similar quantities of butchered bone. Only butchered pieces of bone can be used in this type of economic analysis.

The urban pattern for sites dated to the turn of the century consists of 5 attributes:

1. A Euro-American butchering style dominates.
2. The main source of meat is from domesticated animals not wild animals.
3. Meat from a variety of sources was utilized, including fish and fowl.
4. Consumer patterns indicate that beef was the meat of choice, followed by lamb and pork.
5. Economic indexing can be used to contribute to socioeconomic restructuring.

Rural Sites

Based on 4 rural sites in San Diego County, the butchering pattern for the same time frame as the urban sites is as distinctive as the urban pattern. Rural sites from this period include the Israel Adobe near Escondido (Van Wormer and Schaefer 1991), two Woods Valley sites located near Valley Center, California (Van Wormer 1990), and the Schott farmstead on Otay Mesa (Phillips and Van Wormer 1991). The rural pattern is distinctive for its lack of faunal material. Either no faunal remains, or extremely small quantities of unidentifiable large mammal bone were recovered from the 4 rural sites included in this study. This indicates that animal bones were not disposed of in the same manner as other household remains. It also indicates that animal bone was not disposed of as was urban animal bones. Suggestions as to the disposition of the bone include 1) the practice of grinding bone as feed for pigs, hogs, and other domesticated animals, and 2) the more complete use of carcasses, such as head cheese, soup bones, etc.

Mexican/Californio Pattern

A third pattern has developed from historic sites' faunal analysis. Rural ranchos and urban Mexican houses inhabited the mid to late 19th century indicate a pattern closer to the urban pattern noted above, but with significant differences.

Faunal analysis from 4 southern California sites was used for this analysis. Three were prosperous rural ranchos occupied by Euro-Americans and Mexicans, and a fourth was a Mexican household in early Santa Barbara.

SBR-2188H was an urban household in downtown Santa Barbara and had two different dates of occupation (Christenson 1989). One feature dated 1860-63 and a second from 1906-1914. Species identification indicated that beef was the preferred meat with sheep/goat, pork, horse species and birds secondary sources. Euro-American butchering was practiced. In 1848, Lansford Hastings published *The Emigrant's Guide to Oregon and California*. He describes a meal in California with a "...higher order Mexican family" in an "adobie" (p. 125). He states that the noon meal consisted of a large quantity (half or quarter) of beef roasted over a fire. Beans and bread accompanied the beef. Also at the Santa Barbara site, bird bone consisted of both domestic and wild species (domestic mallard and dove). The horse bones were smaller and may have been from burro or donkey. Donkey meat is available today in markets in Ensenada, Mexico (Van Wormer n.d.). In the early part of the nineteenth century, horses were so abundant in California that they were actively hunted and killed. The horses ate grass needed for cattle, plus the wild horses lured away domesticated horses (Burcham 1982:127).

ORA-13B was a rancho period (1840s to 1860s) sheep ranch (Demcak 1990). Cow, pig and sheep were butchered, with sheep bone being the most abundant. Numerous immature vertebra, some butchered, were recovered. It is expected that these were from sheep, although in most cases that bone was too fragmentary to adequately determine species. While most animals are butchered before adulthood, lamb is consid-

ered a fine delicacy. Cranial and foot remains dominated in the historic component, indicating that butchering was the primary activity at the site. However, some postcranial butchered bones indicate that, on occasion, additional processing and eating occurred at the site.

Los Penasquitos Ranch House (SDI-8125/H) was occupied continuously from 1860 through 1981. Garbage areas dated between 1870 to 1910 yielded numerous animal bones, most of which were from cows. While the analysis is still in process, several aspects are relevant to the present discussion. The butchering pattern was dominantly Euro-American and butchering was conducted on site. Interviews with a person who was a child in 1910 indicated that one extant building was used to butcher cattle. Beef was the preferred meat; however, sheep, pig, and wild animals and birds supplanted the diet.

The El Cuervo Adobe (SDI-8120H) was built in the 1850s and occupied until approximately the turn of the century. No background information has been explored at this time for this ranch house. However, excavation of a well indicate butchering patterns similar to those mentioned for Los Penasquitos.

The Mexican/Californio pattern has the following attributes:

1. A Euro-American butchering pattern dominates.
2. Beef is the meat of choice.
3. Meat is acquired from on-site butchering, not from butcher shops.
4. A wide variety of wild animals also provide meat.
5. No economic indexing can be applied to cuts butchered at the ranch and not from a butcher.

Conclusion

In conclusion, patterns of meat use are reflected in the bone refuse from historic period sites. When butchered bone is present, ethnic and economic analyses are possible. This research demonstrates that bone from an upper class urban hotel has the highest economic index, while bone from a single winter occupation reflects the economic status of the people at the site. All urban patterns reflect Euro-American butchering patterns. In southern California urban versus rural patterns are reflected in the presence or absence of animal bone in the garbage. Historic records indicate that these rural households were occupied by Euro-Americans, while rural households with a combination of Mexican and Euro-American occupants have a faunal depositional pattern closer to that of the urban pattern.

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