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ORIGINAL ARTICLE

Culinary Crafts and Foods in Southwestern Ethiopia: An Ethnoarchaeological Study of Gamo Groundstones and Pottery

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Abstract Few ethnoarchaeological studies have combined the production and use of groundstones and pottery as indicators of household variation in subsistence and socioeconomics. This ethnoarchaeological study explores how the Gamo people who live in southwestern Ethiopia interact with their culinary tools of pottery and groundstones. One of the unique cultural features of the Gamo is their strict caste system, which forces artisans such as potters and groundstone makers into a full-time specialization. This paper uses a *chaîne opératoire* analysis regarding groundstone and pottery production and then addresses their use by drawing from household studies from three Gamo communities. The analysis discusses the role that social hierarchy can have on cooking and craft variation within households. Thus, these artisans bring to life crafts that give the Gamo tools to create their daily subsistence, and these tools and foods allow us to explore two key archaeological issues: subsistence and socioeconomic variation of people's households.

Résumé Peu d'études ethnoarchéologiques combinent la production et l'utilisation de pierres polies et de poterie comme indicateurs de la variation alimentaire et socio-économique des ménages. Cette étude ethnoarchéologique montre comment le peuple Gamo qui vit dans le sud-ouest de l'Ethiopie interagit avec ses outils culinaires de poterie et de pierres polies. L'une des caractéristiques culturelles uniques des Gamo est leur système strict de caste, qui oblige les artisans tels que les potiers et les fabricants de pierre polie à se spécialiser à temps complet. Cet article utilise une analyse de type "chaîne opératoire" de la pierre polie et de la production de poterie et aborde leur utilisation en s'appuyant sur des études de ménages dans trois communautés Gamo. L'analyse porte sur le rôle que la hiérarchie sociale peut avoir sur la cuisine et la variation de l'art culinaire au sein des ménages. Ainsi, ces artisans donnent vie à l'artisanat qui fournit des outils aux Gamo pour créer leur subsistance quotidienne et ces outils et ces aliments nous permettent d'explorer deux questions clés archéologiques , la subsistance et la variation socio-économique des ménages.

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Introduction

Foods signify identity at many different scales pertaining to gender, status, age, and ethnicity (Curet and Pestle 2010: 414; Haaland 2007: 328; Insoll 2007: 25; Lyons 2007). While it is well established cross-culturally that luxury or high-status foods are important indicators of social stratification (Arthur 2002, 2003; Blitz 1993; Carlson 1990: 303–304; Damerow 1996; de Garine 1996: 210; Dietler 1996; Hayden 1996; Netting 1964: 376–377; Potter 2000), many of the staple foods processed daily with groundstones and pottery also provide an excellent means by which to explore historical changes of identity (Dubreuil 2004; Mills 2008). For example, during the African Neolithic, the innovation of groundstones and pottery led to the processing of grains into more palatable forms such as porridges and beers that united people and reinforced their solidarity in ritual and everyday life (Appadurai 1981; Close 1995; Dietler and Hayden 2001; Edwards 2003; Haaland 2007; Huysecom *et al.* 2004; van der Veen 2003). Today in many parts of Africa, groundstones and pottery continue to be important tools to process foods, and their production is often controlled by specific caste groups (Arthur 2003, 2006; Gosselain 2000; Sterner and David 1991; Todd 1977).

This paper draws from my ethnoarchaeological research among the Omotic-speaking Gamo of southwestern Ethiopia (Fig. 1) to reveal the relationship between their caste hierarchy and their food-processing tools. The Gamo have a strict caste system, in which artisans hold technological knowledge for the production of everyday household items including groundstones and pottery, while the farmer caste owns most of the land and resources used for food production, especially luxury foods. Thus, Gamo social organization is intermeshed with craft production and daily and ritual meals. The majority of the one million Gamo engage in subsistence farming of corn, sorghum, teff, finger millet, carrot, sugar cane, coffee, banana, orange, mango, passion fruit, and avocado in the lowlands and wheat, barley, potatoes, enset, *koltzo* (an indigenous root crop), beans, and peas in the highlands. If not engaged in subsistence farming or as a merchant in one of the local towns, then it is most likely that the individual is an artisan, working as a potter, hideworker, groundstone maker, or ironworker.

Most of the Gamo who live in the central region divide themselves into three hierarchical caste strata: *mala* [highest prestige and farmers and weavers]; *mana/chinasha* [potters]; and *degala* [lowest prestige and groundstone makers, ironsmiths, and hideworkers] (Abeles 1979; Arthur 1997, 2002, 2003, 2006, 2009, 2013; K. Arthur 2013; Bureau 1975, 1981: 85–87; Straube 1963: 380–384; Weedman 2002, 2006). It is common today for the Gamo to organize themselves into endogamous caste strata according to occupation and patrilineal descent. Each caste group is usually associated with different levels of prestige, purity/pollution, and power that restrict social interactions (household space, sexual activity, burials, *etc.*) and access to leadership positions between caste groups. Many people consider the artisans to be ritually impure, and therefore, any contact between the *mala* (ritually pure) and the artisans that is not

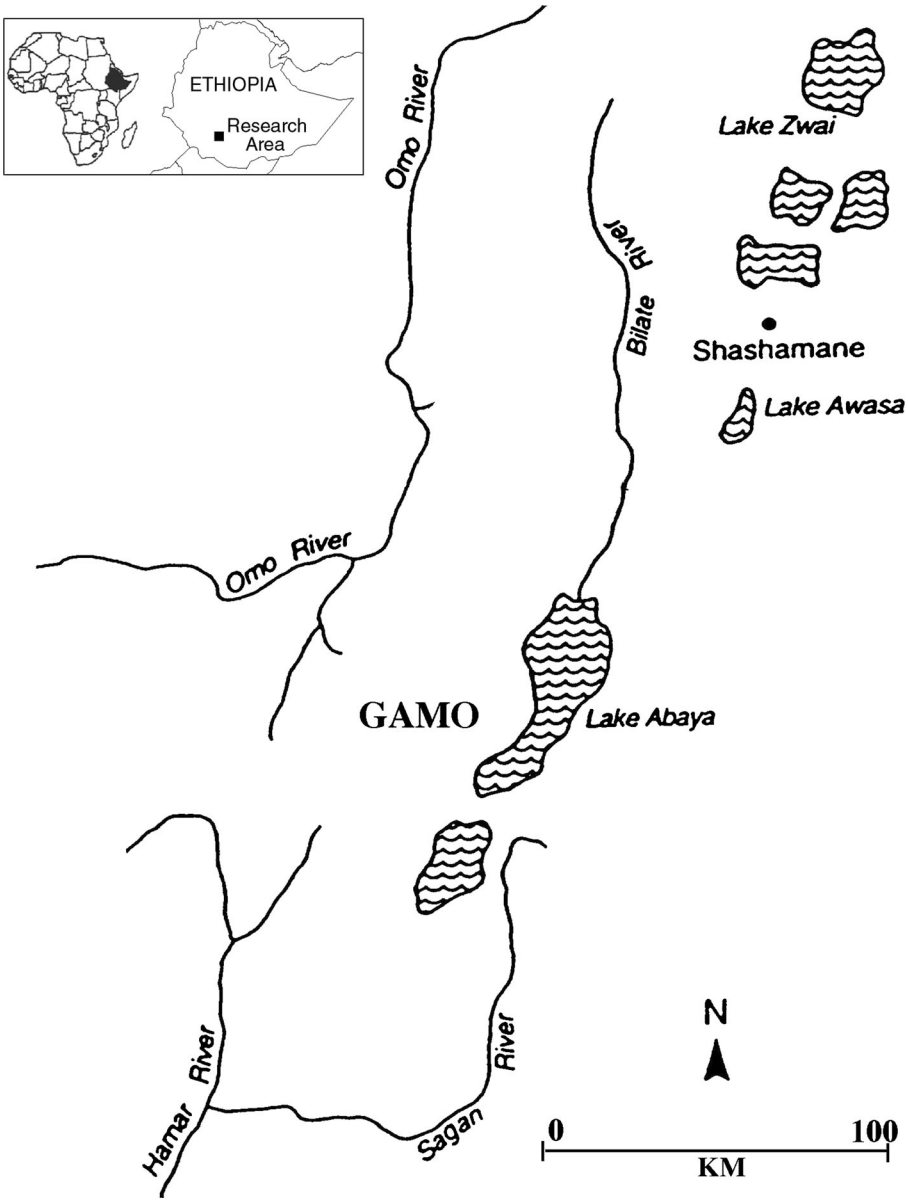

Fig. 1 Map of the Gamo region within Ethiopia and Africa

culturally sanctioned will result in the disturbance of the ancestors, which could result in the infertility of the people, land, and nature. Restrictions on food commensality between caste groups mean that diet and the social context of eating provide strong indicators of caste. Gamo artisans have less access to foods, especially luxury foods, and artisans and the *mala* do not share meals together. The lower caste families have limited access to luxury foods such as meat, milk, butter, and beer, which diminishes the diversity of their diet.

Luxury foods are culturally specific, but generally they are regarded as being highly desired (van der Veen 2003; Berry 1994). People form distinct social, economic, and religious boundaries outlining who has access to luxury foods and who may be associated with feasting and ritual offerings. Among the Gamo, luxury foods of meat, milk, butter, and beer representing wealth, power, status, and fertility are expressions of their caste membership by defining who has control over these goods. These luxury foods link the Gamo to their ancestors who live in the sacred forests, which only the high-caste *mala* may visit. The sacred forest is where an animal is bestowed by the people on a ritual-sacrificer, who offers the animal by spreading its blood on specific areas of the forest for their ancestors, as a request for future fertility for the people, land, crops, livestock, and animals. Milk and butter have a special place as foods that represent fertility. Butter is an integral part of the initiation ceremony for ritual-sacrificers (*halakas*), who present the butter to everyone in the ceremony and then rub it in their long hair, giving the sacrificers a special hairstyle known as *dishko* (Freeman 2002: 84, 104). Lastly, beer is the food for feasts at the initiation of *mala halakas* and other ritual leaders; before a feast begins, the Gamo elders pour a portion of their beer on the ground to symbolically feed the ancestors as an offering. Beer embodies a sacrament to their ancestors in return for fertility to the community. Thus, the *mala* maintain their social positions by controlling luxury foods, which are used to honor ancestors, and in return, the ancestors will reward the *mala* with fertility.

Expanding upon the consumption of luxury foods to mark status, this paper explores Gamo production and use of culinary tools that transform luxury foods into symbols and boundaries of their social hierarchy. One goal of this paper is to demonstrate that archaeologists and ethnoarchaeologists should not partition the production and use of culinary tools since they are coupled and reflect the diversity and actions of social relations. Furthermore, I engage ethnoarchaeology as the medium for revealing how foods and their associated crafts represent Gamo identity, and to demonstrate how we can use this information to expand archaeological methods and analyses to better reveal the relationship between foods, craft, and status. My goal is to give archaeologists tangible signifiers concerning issues of social stratification and culinary habits.

Methodology

The majority of the research described in this paper was conducted between September 1996 to April 1998 and, more recently, between May and July of 2012 in the Gamo districts of Ochollo, Doko, and Zada (Arthur 2002, 2003, 2006, 2009, 2013; Arthur *et al.* 2009, 2010). This paper draws on my interviews with potters, groundstone makers, and the consumers who use their crafts with a focus on the social and technical issues related to pottery and groundstones. I documented each sequence of the potters' and groundstone makers' production process to address issues of regional variation, individual innovation, and cultural tradition. In addition, I analyzed all vessels and groundstones from 60 households in three communities representing individuals and families of each caste and socioeconomic group in the Gamo society, which gave me insight into the consumer's perspective.

I concentrated my research in three communities: Zuza Ochollo and Guyla Zada, which are pottery-producing communities, and Etello Doko, a non-pottery-producing

community. Each of these communities uses groundstones, but groundstone makers live in the remote areas located on the Rift Valley escarpment and travel into the highlands to sell their groundstones. Zuza is located overlooking the Rift Valley escarpment and is at a lower altitude than either Guyla or Etello. Therefore, I was interested to determine if communities at different altitudes were processing different types of foods. Other researchers (Samberg *et al.* 2010) suggested that the Gamo's indigenous diet varies according to the differential geography that characterizes their land, which is situated on the edge of the Rift Valley, providing dramatic physiographic relief and a series of diverse subsistence agroecosystems.

I began my research by speaking with community elders in Zuza, Etello, and Guyla to introduce myself and my research goals. Then I went to each household and compiled a census, outlining the social and economic dynamics within each community. After the census was completed, I chose 20 household compounds from each of the three communities. In each village, I stratified the sample to include the different socioeconomic groups (*i.e.*, elder, farmer, potter, hideworker, *etc.*). At each of the 60 household compounds, I recorded the complete life cycle for each ceramic vessel and groundstone (where purchased, cost, age, use, stored, *etc.*). I recorded 1,058 pottery vessels and 121 groundstones from the 60 households in the three Gamo villages. To determine how caste hierarchy relates to food preparation and consumption in all three communities, I inquired how women use their groundstones and pots for processing luxury and nonluxury foods. For each vessel, I recorded each type of use-alteration attribute and its location on the pot. I also interviewed and observed Gamo potters and groundstone makers concerning how they made their crafts. Thus, this analysis incorporates two types of analyses, *chaîne opératoire* and the life cycle. My chaîne opératoire or operational sequence focused on the detailed production process of the pot and groundstone (*e.g.*, Bar-Yosef and Van Peer 2009; Gosselain 2000; Leroi-Gourhan 1964), while my life cycle approach addressed issues from procurement to discard, thus focusing on the entire life of an item and not just on production (*e.g.*, Schiffer and Skibo 1997; Skibo 1999, 2009). Together, these two methodological tools allowed me to reconstruct the entire sequence of an artifact from procurement to discard.

Gamo Culinary Tool Production

Among the Gamo, craft production including groundstones and pottery is a restricted specialized knowledge, reserved for individuals of a specific caste group. Artisans even speak an argot or ritual language to protect their craft knowledge and often produce their goods inside their household or workshops. They also transmit craft technology only to specific individuals within a caste lineage.

Groundstone Production

Today, groundstone making among the Gamo is a male activity and this craft is transmitted from father to son only in selected lineages of the *degala* caste group. Finding, procuring, and producing groundstones is demanding and takes enormous strength and energy, and thus, boys do not begin to learn the craft until their fathers

believe they are strong enough: sometime between the ages of 15 to 18 years old. The tools to make groundstones are passed down from father to son as well. Fifteen years of experience is required before a groundstone maker believes he is a master of his craft. There are only a few communities in the central and northern Gamo area where groundstone makers live. This is partly due to having restricted source areas. Oral history from the groundstone makers indicates that their families had originally lived in the Chencha Zardo area, but three generations ago their great grandfathers moved to Mota after the *mala* invited them there and gave them land closer to the source.

The first challenge for the groundstone makers is to find suitable stone to make groundstones from, which leads them on day-long searches. Geologically, the groundstone makers quarry their stones in areas where the basalt is exposed and where gravels and debris are found in river valleys (Pierluigi Pieruccini and Mauro Coltorti, personal communication, 2012). The rocks are a rhyolite formed from highly viscous lavas (Franco Talarico, personal communication, 2012). Dubo Donga Shakay is a dry riverbed where they sometimes are able to find a suitable boulder of rhyolite for their raw material. They will first travel to known quarries in drainage areas but sometimes are not able to find the right type of rock and, therefore, must search in the larger riverbeds that drain from the Gamo mountains down into the Rift Valley. If the groundstone makers find a rock on a landowner's land, they will pay the landowner by making him a groundstone.

Groundstone makers use direct percussion to produce both a handstone and groundstone blank at the quarry (Fig. 2). Groundstone makers bring hammerstones and sledge hammers from home to the quarry. They also work with one or two other artisans and/or their sons. Since making groundstones is such an arduous craft, men will work together to help hold the stone while it is being prepared and help move and position the stone as it is being reduced. They state that, "we cooperate with each other to produce nice groundstones." Groundstone makers first use direct percussion with a hammerstone and an iron mallet to prepare the surface of one side of the boulder. After

Fig. 2 Gamo groundstone producer using a handstone to work the groundstone blank at a quarry

creating a suitable platform on one surface of the boulder, they continue to use direct percussion but with a larger hammerstone to remove a large flake (Fig. 3). They then shape the edges of the flake with a small hammerstone to form a rough handstone blank. After they form the blank, they return to the original core and continue to remove flakes systematically from three other sides using the sledge hammer/iron mallet. Once they have detached large flakes from the core/raw material removing a majority of the cortex (*zoro*), they position the groundstone on its side, wedging it between the removed flakes, to position it for shaping. With a smaller hammer stone, they more finely shape and thin the groundstone edge and the grinding surface. The side of the core from which the flake for the handstone was removed becomes the *ulo* (stomach) or ventral surface of the final grinding stone. Once both the groundstone and handstone are roughly shaped and small enough to lift, they take both pieces into the shade and continue to shape them with a small hammerstone. Groundstone makers shape both pieces primarily at the quarry, and then will carry the stone 5 km to the house either by themselves or by a donkey, if they are fortunate enough to own one. Once at the house, the groundstone maker uses a small hammer stone to form the "teeth" of both the handstone and the grinding surface of the groundstone by pecking at it, removing the softer material to create a rough hard grinding surface (Fig. 4). Completion of a ground- and handstone takes approximately 1 day at the quarry and 1 day at home; the final products will earn the groundstone maker approximately 200 to 300 ETB ($11–18).

Gamo groundstone workers make three different types of groundstones (*wootza*) with associated handstones (*mylee*) (Tables 1 and 2): (1) *bootsa wootza*/*dada achay*; (2) *lefay* or *sepay wootza achay*; and (3) *berberey wootza*. *Bootsa wootza* or *dada achay* (*i.e.*, thunder teeth) is the largest groundstone, and women use this for the first grind of grains such as wheat, barley, teff, corn, or coffee. *Lefay* or *sepay wootza* is a little smaller, and women use it to grind enset and for the second grind for grains or coffee (Fig. 5). *Berberey wootza* is the smallest, and women use it to grind peppers and enset (Fig. 6). Groundstone and handstone shapes are generally oval, with a few being square or elliptical in shape. Gamo handstones tend to be flat, which has been shown to aid in

Fig. 3 Gamo groundstone producer using a large hammerstone to remove a large flake from the groundstone

Fig. 4 Gamo groundstone producer making the "teeth" on the groundstone

reducing the grains into smaller particles and therefore releasing more nutrients for meals (Dubreuil 2004; O'Dea *et al.* 1980; Stahl 1989; Wright 1992: 55, 307).

Although the production of traditional crafts is declining on a worldwide scale, the Gamo groundstone workers believe that the demand for their work is increasing, even though mechanized mills are springing up throughout the countryside. Increasing population growth, lack of electricity, increasing fuel prices, mechanical breakdowns, and the absence of a mill technology able to grind enset (an indigenous crop) are factors that contribute to the continued production of groundstones. This increased demand has resulted in substantially increased prices over the last 40 years from 1.50 to 70 birr for a *berberey wootza* and 3.00 to 300 birr for a *bootza wootza* groundstone.

Pottery Production

Pottery production is a learned skill transmitted to a select group of Gamo girls and women in the *mana*/*chinasha* caste group (Arthur 2006, 2013). Girls raised within a potter household begin to learn how to produce pottery when they are 6 to 13 years old. Mothers and other elder potters begin teaching girls with informal instruction, which usually last for 3 years or until the daughter is married. Girls begin with simple but critical tasks such as helping their mothers mine and carry the clay from the clay sources to the potter's household (Fig. 7). Once the clays are back at the household, girls will begin to clean the clay of large stones, grinding the clay on a groundstone, selecting grog temper from broken pots that cracked during the drying or firing process, and transporting water from the well or stream using a large jar to mix the clays. After they become more experienced with all of the production activities, they will begin practicing with the more difficult task of forming small vessels. Eventually, they will begin to work on making all of the vessel types used for processing the varied culinary dishes. Potters have to be adaptive because their own personal life cycle requires that they learn two different ways to produce pottery, the first in their natal community and then the next in their husband's community. Women marry and move to their husband's community, which may prefer different foods, and this will impact the type of vessels a newly married woman will produce. In addition to different foodways, a potter may

Table 1 Statistical description of groundstone types by community

Community/type	Mean	Median	Minimum	Maximum	STD
Zuza *bootza* (*n*=25)					
Length	66.37	66.65	58.5	76.7	4.26
Width	40.70	40.50	14.0	48.5	6.84
Area (cm^2)	2,712.95	2,730.23	931.0	3,719.95	557.16
Wear (mm)	10.26	11.0	2.0	18.5	5.25
Zuza *lefay* (*n*=22)					
Length	57.00	55.8	45	73.5	6.55
Width	35.58	34.80	29.4	45.5	4.26
Area (cm^2)	2,050.85	1,934.75	1,476.0	3,344.25	492.11
Wear (mm)	11.73	10.0	3.0	28.0	7.16
Zuza *berberey* (*n*=1)					
Length	24.0				
Width	33.1				
Area (cm^2)	794.4				
Wear (mm)	21.0				
Etello *bootza* (*n*=8)					
Length	62.94	62.2	52.4	70.5	5.96
Width	39.22	39.0	33.5	44.7	4.09
Area (cm^2)	2,478.24	2,425.80	2,043.60	3,151.35	363.57
Wear (mm)	8.06	9.0	3.0	12.0	3.44
Etello *lefay* (*n*=16)					
Length	57.82	59.0	49.0	68.8	5.63
Width	36.0	34.7	31.0	47.2	4.06
Area (cm^2)	2,094.47	1,934.40	1,626.52	3,247.36	413.88
Wear (mm)	8.08	8.0	2.0	14.0	3.50
Etello *berberey* (*n*=2)					
Length	35.0		31.0	39.0	
Width	29.3		27.8	30.8	
Area (cm^2)	1,031.50		861.80	1,201.2	
Wear (mm)	2.0		2.0	2.0	
Guyla *bootza* (*n*=7)					
Length	64.33	64.0	60.0	70.0	3.28
Width	41.05	41.40	37.0	46.0	3.26
Area (cm^2)	2,646.45	2,574.87	2,331.0	3,220.0	321.17
Wear (mm)	12.5	12.5	3.0	20.0	6.65
Guyla *lefay* (*n*=19)					
Length	58.36	58.0	51.50	66.0	4.02
Width	37.24	36.5	32.0	43.5	3.52
Area (cm^2)	2,178.0	2,180.90	1,696.0	2,697.0	289.52
Wear (mm)	13.27	13.0	0.0	31.0	7.96
Guyla *berberey* (*n*=5)					

Table 1 (continued)

Community/type	Mean	Median	Minimum	Maximum	STD
Length	33.32	33.50	30.0	36.30	3.05
Width	34.0	34.50	31.50	35.50	1.77
Area (cm^2)	1,130.17	1,118.25	1,050.0	1,234.20	76.44
Wear (mm)	16.0	15.0	7.0	27.0	9.5

discover in her marital community different clay and temper sources, new types and locations for fuelwood, and new weekly markets for selling her wares.

The mining of clays is a dangerous task and I know of two Gamo potters who have died when doing so (Arthur 2006, 2013 for further discussion on clay procurement). Each community has its own set of clay sources, which are either mined by individuals or with other potters in the village. Women and men engage in digging and collecting the clay, but due to the strict gender rules, it is only the women who will transport the clay back to the household (Fig. 8). Digging and then carrying the clays home is a timely and difficult task for potters, and therefore, the proximity of the clay mines is an important factor for Gamo potters. They carry the clay in baskets (*tise*) or in grain bags on their backs, but sometimes are fortunate enough to have a donkey that can aid them in the transport. Gamo potters are similar to other potters worldwide in that they mine their clay from sources less than 6 km from their village (see Arnold 1985: 39–52). This is not surprising given the amount of labor involved in transporting clay.

Once the clays have been brought to the household, there is a detailed set of techniques used to prepare the clay before the potter can begin forming the vessel (Arthur 2006, 2013). It begins usually with the entire family working together to clean the clays of unwanted large temper, which could cause problems by ripping the clay wall when the potter is forming the vessel. Most Gamo potters mix three to four types of clay together to produce all of the vessel forms. Naturally mined temper (nonplastic inclusions) and/or grog (small pieces of broken pottery) also are added to the clays. Some Gamo consumers will sell or trade their broken pots back to a potter so that the grog can be used as temper. After the clays are cleaned, they are pounded by potters with a large stick (*bookadoka*) and sifted through a woven basket (*zizarey*) (Fig. 9). The *zizarey* or woven basket also serves to aid in measuring the clay proportions in the final clay mixture. Each potter will decide on the proportion of clays she will use, with some clays being symbolically male or female and having special traits that link each clay to their gender roles. The potters mix the clays by stomping on them with one foot. Once the clays, tempers, and water have been mixed together in their proper proportions, the potters can begin to form the vessels.

The variation evident in the production of the 14 different Gamo vessel forms highlights the complex and intricate knowledge and skills that are essential to women potters. Using the *chaîne opératoire* approach, the detailed decision-making of potters can be documented for each vessel type and compared to the social and historical context of a society to address issues of social boundaries through patterns of pottery production (*e.g.*, Dietler and Herbich 1998; Gosselain 1998; Graves 1994; Hegmon 1998; Hosler 1996; Stark 1998, 1999; Stark *et al.* 2000). As I have described in detail

Table 2 Statistical description of handstone types by community

Community/type	Mean	Median	Minimum	Maximum	STD
Zuza *bootza mydey* (*n*=22)					
Length	30.09	31.0	15.0	37.0	4.93
Width	20.31	21.0	9.0	24.40	3.08
Area (cm^2)	624.29	651.0	135.0	885.72	162.69
Zuza *lefay mydey* (*n*=18)					
Length	20.52	19.50	12.30	34.50	5.49
Width	15.16	14.80	8.40	23.0	4.02
Area (cm^2)	328.85	273.0	109.20	793.50	171.16
Zuza *berberey mydey* (*n*=1)					
Length	19.0				
Width	12.0				
Area (cm^2)	228.0				
Etello *bootza mydey* (*n*=9)					
Length	29.93	31.90	13.70	35.0	6.94
Width	20.65	21.0	18.0	22.0	1.50
Area (cm^2)	626.11	684.0	246.60	766.50	171.16
Etello *lefay mydey* (*n*=14)					
Length	28.43	28.60	21.50	35.90	4.25
Width	18.19	18.30	13.20	21.0	2.40
Area (cm^2)	523.46	509.40	333.25	753.90	134.85
Etello *berberey mydey* (*n*=2)					
Length	12.25		9.0	15.50	
Width	9.65		6.8	12.50	
Area (cm^2)	127.47		61.20	193.75	
Guyla *bootza mydey* (*n*=7)					
Length	29.08	31.10	20.0	35.80	6.81
Width	18.83	20.75	3.50	25.0	7.73
Area (cm^2)	575.50	651.30	77.0	850.0	296.07
Guyla *lefay mydey* (*n*=19)					
Length	25.70	27.0	14.80	32.80	5.16
Width	18.03	18.0	14.70	22.50	2.19
Area (cm^2)	472.02	481.50	219.04	738.0	139.76
Guyla *berberey mydey* (*n*=5)					
Length	12.05	11.60	9.50	15.50	2.66
Width	9.37	9.0	7.50	12.0	1.93
Area (cm^2)	116.78	104.95	71.25	186.0	50.0

elsewhere, women form their vessels using a combination of hand building, coil-and-scrape, and paddle-and-anvil techniques (Arthur 2006, 2013). Gamo and other southern Ethiopian potters do not use a wheel to form their vessels but will move their vessels

Fig. 5 *Bootza* (*left*) and *lefay* (*right*) groundstones used to grind grains

around as they form them and, thus, act as a wheel. This innovative technique is only known in southern Ethiopia. Gamo potters construct bowls, jars, plates, and pitchers and each of these forms has a unique sequence of vessel construction. While each form has unique construction sequences, there are some aspects that crosscut all forms, such as potters using a piece of leather (*gelba*) or cloth to form the rim and neck while the vessels are still wet. In addition, potters thin the exterior walls with a bamboo stick (*mylee*) and the interior is thinned and smoothed with the outer covering of half a seedpod (*kayshe* tree, *Jacaranda mimosifolia*) that is obtained from the lowland area adjacent to Lake Abaya (Fig. 10).

Fig. 6 *Berberey* groundstone used to grind spices, onions, and peppers

Fig. 7 Young potters at a clay source

The Gamo potters are generally consistent concerning how they make each vessel type, but an individual has choices that ultimately determine the types of vessels a potter produces. The potters learning history, community, availability of suitable clays and fuel woods, and consumer demands all affect ceramic production (Arthur 1997, 2006, 2013). Gamo potters will usually specialize in the production of one or two vessel types even if they are able to produce all 14 types (Figs. 11, 12, and 13; Table 3) (Arthur 2006).

For example, Gamo potters form jars (*e.g.*, narrow-mouth small jar, narrow-mouth medium jar, large jar, and beer jar) by drawing the clay up to produce the upper part of the body, and then the neck and rim are formed using the coil-and-scrape method (Arthur 2006: 37–40). Once the top half of the vessel is formed and dried sufficiently, it is turned upside down on its rim and placed on a piece of enset leaf to keep the vessel from touching the ground. Then the rounded base is formed using the coil-and-scrape method until the base is eventually closed (Fig. 14). Potters will decide how large they wish to make each vessel type. In addition, potters living in Guyla will generally make jars with a more rounded body, compared to Zuza potters who tend to produce jars that are more oval in shape. The production process is more elaborate for beer jars. After the

Fig. 8 A Zuza potter mining for clay

Fig. 9 A Zuza potter using a pounding stick (*bookadoka*) to pulverize the clay

upper half is formed, the vessel's exterior is scraped to thin the walls. Then the potter uses two handstones, one in the interior and one on the exterior, to pound and compact the walls of the beer jar. Sometimes the vessel walls will tear during the thinning process and potters explain that they will "stitch" the rip with a piece of clay (Fig. 15).

Gamo potters bring their clay to life when they begin to form their vessels, as some Gamo believe that pots and other materials go through a symbolic life cycle that parallels human rites of passage (K. Arthur 2013). Gamo potters name pots with human anatomical features such that potters name the top of the rim the mouth (*dona*), the neck is also called the neck (*core*), the body is called the stomach (*ulo*), and the base is called the anus (*tache* in Zuza or *meskatay* in Guyla) (Arthur 2006: 46). Furthermore, specific types of decoration correspond to particular anatomical features, such as *dansa*, which translates as breast. This rare type of appliqué is a large oval, which points upward and is placed on the upper body of cooking jars. Besides giving potters a classification for specific parts of a pot, the naming of anatomical features by Gamo potters suggests a symbolic importance to them. Since the majority of potter families rely on the manufacturing of pottery vessels for their sole livelihood, potters take the clay and

Fig. 10 A Guyla potter using a bamboo stick to thin the exterior wall of a jar

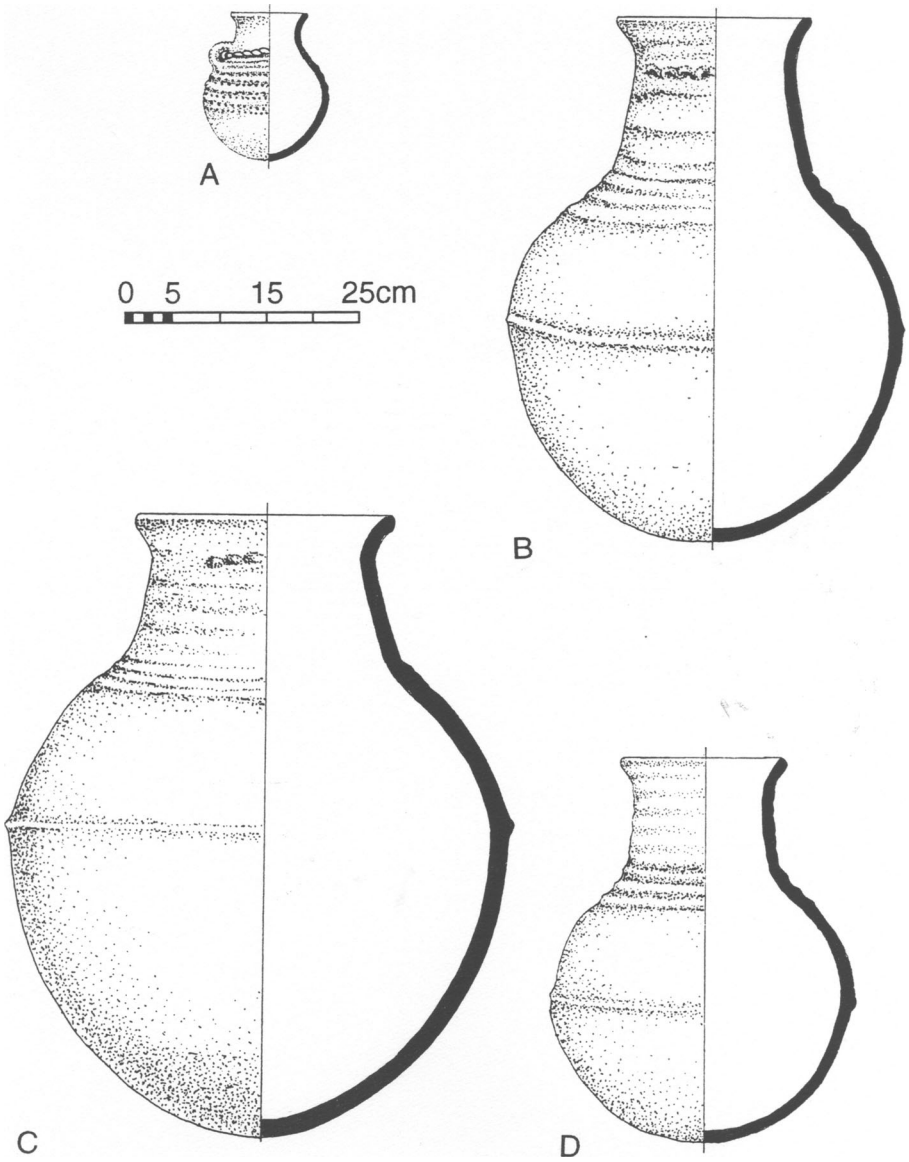

Fig. 11 Profile drawings of **a** narrow-mouth small jar (*tsua*), **b** large jar (*otto*), **c** beer jar (*batsa*), and **d** narrow-mouth medium jar (*tsaro*), which the Gamo potters produce

temper, and bring what the *mala* consider feminine, to life in the form of a pot. The pottery vessel can be used to bring sustenance to the potter's family by selling or exchanging vessels for food and by processing food into an edible form.

Once pots have been decorated, they need to dry. The lack of land that Gamo potters have access to, due to their status within the caste hierarchy, limits their production because they do not have adequate places to dry their pots. The Gamo live in an environment where the weather is humid, moist, cold, and cloudy, especially from May

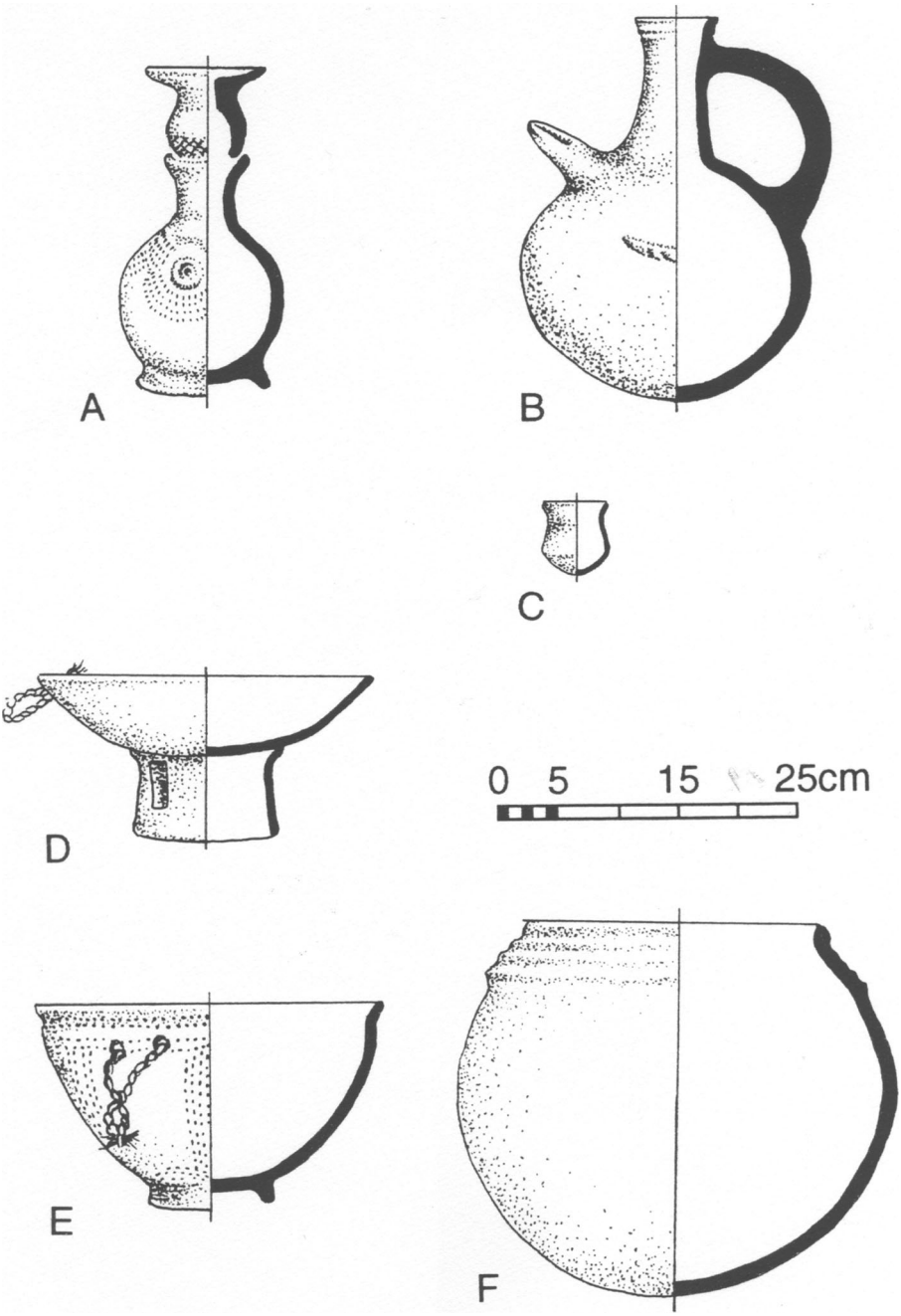

Fig. 12 Profile drawings of **a** water pipe (*guya*); **b** coffee pitcher (*jebana*); **c** coffee cup (*sene*); **d** dish (*peele*); and **e**, **f** bowl (*shele*), which the Gamo potters produce

to September, which increases the drying time. Thus, potters allocate a considerable amount of time for drying which can range from 7 to 28 days depending on the size of

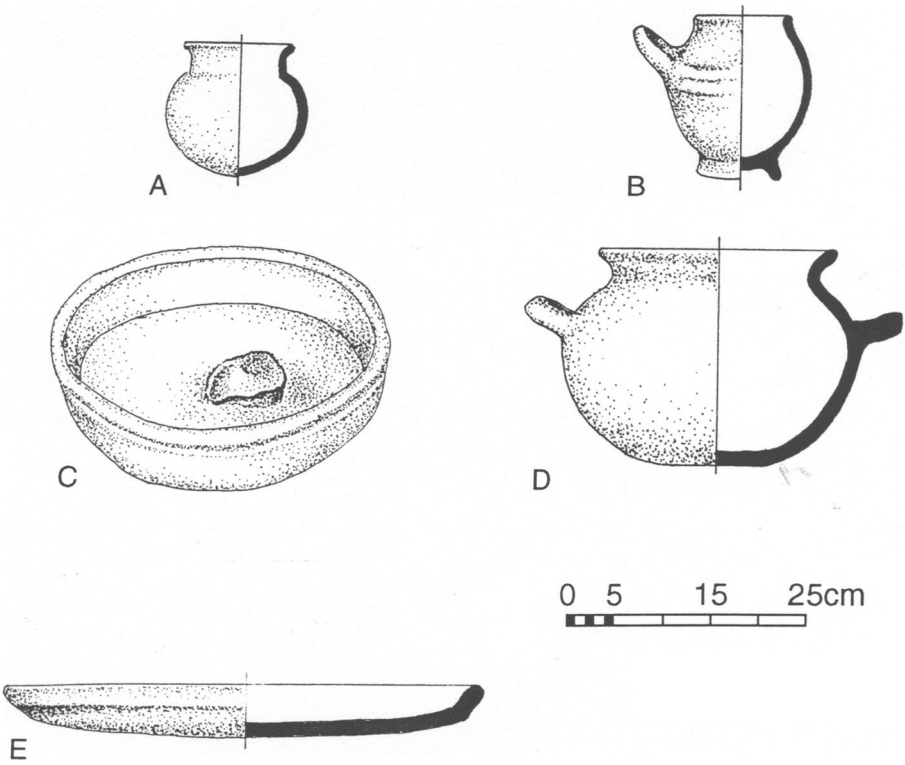

Fig. 13 Profile drawings of **a** wide-mouth small jar (*tache*), **b** single-handle jar (*kolay*), **c** foot washing bowl (*gumgay*), **d** wide-mouth medium jar (*diste*), and **e** baking plate (*bache*), which the Gamo potters produce

Table 3 Gamo vessel types and their corresponding primary use and capacity

Emic types	Primary use	Mean capacity (liters)	Size range (liters)	SD
Coffee pitcher (*jebana*) (*n*=60)	Boil coffee	2.14	0.60–3.05	0.57
Wide-mouth medium jar (*diste*) (*n*=61)	Vegetable and grain cooking	8.40	0.90–65.42	8.93
Large jar (*otto*) (*n*=188)	Vegetable, grain, and beer cooking	12.63	3.88–50.94	6.04
Large jar (*otto*) (*n*=80)	Water storage	19.64	6.37–77.91	12.96
Large jar (*otto*) (*n*=77)	Water transport	14.10	4.85–36.07	6.41
Narrow-mouth medium jar (*tsaro*) (*n*=159)	Vegetable and grain cooking	4.59	0.26–10.30	1.97
Baking plate (*bache*) (*n*=47)	Roasting	4.56	0.78–7.91	1.42
Bowl (*shele*) (*n*=182)	Serving	11.73	0.06–87.07	12.76
Dish (*peele*) (*n*=33)	Serving	4.73	1.15–11.81	2.14
Narrow-mouth small jar (*tsua*) (*n*=78)	Serving	1.04	0.06–3.05	0.60
Beer jar (*batsa*) (*n*=86)	Storage and beer processing	64.96	20.57–195.33	30.73
Water pipe (*guya*) (*n*=28)	Water pipe	1.44	0.90–2.14	0.26

Fig. 14 A Guyla potter forming the base of a jar by using the coil and scrape method

the vessel. Seasonality, clay types, and vessel size and types influence potters' decisions on how long to dry their vessels.

After drying the pots, potters pre-fire vessels on top of a wooden rack (*afansha*), located in the workshop or potter's house or sitting on the ground near the fire. Men and women share in the duties of firing the vessels. The vessels are slowly smoked and heated for approximately 4 hours before being put in the open fire, located outside in the compound (Fig. 16).

Artisans control the production of groundstones and pottery, and it is their technological ingenuity that transforms crops into food. Yet, while artisans provide the necessary crafts to process the diverse culinary traditions of the Gamo, they do not have access to the variety of luxury foods that the *mala* enjoy and control. Therefore, Gamo caste identity is manifested in craft production and the production and consumption of daily and ritual foods.

Gamo Food Processing

Groundstones and pottery are used in every Gamo household to transform crops into cuisine. Ethiopian women are the innovators of Ethiopian cuisine and hold the expertise

Fig. 15 A Guyla potter "stitching" a rip in a beer jar (*batsa*)

Fig. 16 A Gamo potter family removing their pots from a firing

and knowledge for transforming crops into culinary traditions and group identity. Their socioeconomic position dictates the diversity of meals they prepare. All Gamo meals require a considerable amount of preparation including unfermented and fermented foods eaten in daily and ritual contexts. For rural Gamo people, the majority of their meals are vegetarian, as slaughtering their livestock is only done during yearly celebrations such as Meskal or Ethiopian New Year, or Easter. Many Gamo consider several crops to be *baira*, or the elder among their foods, such as enset, barley, and emmer wheat. Gamo women prepare these *baira* crops for both daily and ritual use. Daily meals are usually a mixture of porridges, boiled potatoes and enset, or fermented meals made from enset such as *uncha* (a fermented bread).

The caste hierarchy has a dramatic impact on the types and diversity of foods caste members subsist on, especially for the artisan caste groups. Some artisan families did obtain farmland during the Derg rule between 1974 to 1991, but many artisans still rely solely on their crafts to trade for food or money, and this reduces the variety of foods available to artisans compared to more wealthy land owners. Luxury foods such as meat, milk, butter, and beer are rarely found in artisan diets (see below). However, most Gamo women use groundstones and pottery to produce a variety of complex recipes consisting of nonfermented and fermented foods.

Nonfermented Gamo Foods

The Gamo transform nonfermented grains, vegetables, tubers, milk, and meats into ritual and everyday foods. Their recipes engage the use of groundstones and pottery to process these ingredients through grinding, boiling, and roasting, to produce porridges and foods that are boiled, roasted, and stewed.

Gamo recipes, especially porridges made from grains, are similar but vary in how fine the women grind the grains (*i.e.*, barley, wheat, corn, millet, sorghum) and the addition of ingredients such as milk or spices cooked in jars (*diste*, *tsaro*, or *otto*). A time-consuming ceremonial meal is called *gordo*, a porridge-like food made of barley and served only on Meskal and Easter. Gamo women pound the barley three times using a wooden mortar and pestle to remove the husk and then grind it using a *bootza* groundstone three to four times. Between each grinding period, the woman processes

the ground barley through a narrow woven sieve (*zizarey*). After she believes the barley is properly ground, she boils water and milk in a cooking jar (*diste*, *tsaro*, or *otto*) and slowly adds the ground barley while constantly stirring with a bamboo stick. After about an hour of cooking, the woman removes the *gordo* from the cooking jar, mixes it with butter, and serves it in a serving dish (*shele*).

An additional barley porridge prepared and served during Easter and Meskal is *gabula*. This meal is similar to *gordo* in how it is prepared; however, only milk, and fenugreek, is added at the end, the latter after being ground on a *berberey* groundstone and roasted on a baking plate (*bache*). The celebrants eat *gabula* communally by sitting around large serving bowls (*shele*) and scooping up the *gabula* with large wooden forks (*conchay*). A variation of *gabula* is *shona*. S*hona* is made with barley, wheat, corn, or sorghum and has a finer texture than *gordo*.

Butter and milk are expensive ingredients and this is why women only prepare *gordo* as a special meal. Most Gamo own few milk cows, and on average, the production of butter requires 7 days of milk collection. The milk is collected in a special jar (*otto*) that has a hole in the upper portion of the neck, which the women will plug with an enset leaf. Women use a dried enset leaf as a lid, which is tied down around the lip and neck of the jar by using enset string. A woman rocks the jar back and forth for about 8 hours, after which she unplugs the hole in the neck to check if the butter is floating atop the milk. If ready, she will take the butter out of the jar and drink the remaining portion of the milk. Thus, butter is one of the most labor-intensive Gamo foods.

Kuchuca is another time-consuming but popular Gamo nonfermented meal that people eat during ceremonies and also for a daily meal. It is made out of barley, salt, and dry ground pepper and is labor-intensive to prepare. The meal requires a series of pounding, grinding, and roasting events. First, a woman pounds the barley with a wooden mortar and pestle to remove the husk and then she places the barley in the sun for an hour resting on an enset leaf. When the barley is dry, she roasts the barley on a ceramic baking plate (*bache*). After roasting, she again pounds the barley with the mortar and pestle to remove the remaining husks, and then she grinds it on a *bootza* groundstone and sieves the barley through a woven basket (*zizarey*) to further remove any husks. The mixture is subsequently ground on the *lefay* groundstone, adding salt, dry ground pepper, and sometimes fenugreek. The fenugreek is roasted on a baking plate (*bache*) and then ground extensively on a *lefay* groundstone. Women form the *kuchuca* into balls to serve at a daily meal or leave it in its ground state to serve at a ceremonial feast.

Other common nonfermented meals will involve less processing labor, such as boiling enset (*chaday*) and mixing it with either cabbage or potatoes; also garlic and/or onions may be mixed into the cooking pot (*diste*, *tsaro*, or *otto*) (Arthur 2006: 18). However, this type of cooking also requires a considerable amount of labor, because young girls and women are the ones responsible for collecting water on a daily basis for the household; this can be a burdensome chore especially during the dry season when the wells and streams have little water flowing. It is common during the dry season for women to stand in long lines to fill their ceramic or plastic containers at the well because of the low water pressure.

An additional luxury food is meat, not a common food for Gamo people living in the rural areas and becoming less common even in some of the larger Gamo towns such as

Chencha. Meat is usually prepared in a wide-mouth medium jar (*diste*) as a spicy stew (*ayshow wat*) or eaten raw with butter and spices (*kitfo*). Chicken is eaten at Christmas and Easter in the form of a spicy stew (*cutoe wat*) (Arthur 2006: 18). Meat is expensive, and even during religious holidays, the artisans usually cannot afford to purchase it. It is customary for the *mala* to give the *degala* the cow's head during Meskal. If the artisans do not receive meat from the *mala*, then they usually purchase with other artisans a bag of barley or corn, which they prepare and eat together.

Fermented Gamo Foods

Fermented foods are a central component of Gamo dishes as they are in many parts of the world. Gamo fermented foods such as beer have a strong association with status, but other foods such as enset crosscut all Gamo caste groups, thus providing essential daily nutrition. Fermentation provides people with five critical factors: (1) it enriches the flavors, aromas, and textures in food; (2) preserves food by using lactic acid, alcoholic, acetic acid, and alkaline fermentations; (3) adds protein, essential amino acids, essential fatty acids, and vitamins to foods; (4) detoxifies food; and (5) it decreases cooking times and fuel requirements (Steinkraus 1994: 261). Cross-culturally, women's knowledge and skills have transformed foods into more savory, nutritious, safer, and long-lasting forms.

All Gamo families rely on enset, which is an indigenous plant that is a staple for the highland areas of southern Ethiopia. As mentioned earlier, the grinding of enset on groundstones is one critical factor as to why groundstones continue to be an important culinary tool in every Gamo kitchen. A common meal prepared by Gamo women is *uncha*, which is a fermented form of enset. Women first scrape the pseudostem or corm of the enset plant (Fig. 17). Enset fermentation occurs by forming the pulverized *uncha* into a ball and then women cover the *uncha* with enset leaves and let it stand for 2 to 5 days. After the initial fermentation, women place the *uncha* in a pit lined with enset leaves. They press the *uncha* with their hands or feet, and then to keep the pit airtight, they cover the pit with heavy rocks. Women ferment their *uncha* for several weeks, months, or even up to a year. After fermentation, women will grind the *uncha* on a groundstone to shape and remove fibers before cooking (Fig. 18). Fermenting enset

Fig. 17 A Gamo women scraping the corm of the enset plant to make fermented *uncha*

Fig. 18 Two women grinding on groundstones: in the foreground, a woman is grinding fermented *uncha* to shape and remove any fibers before cooking, and in the background, another woman is grinding barley

causes an increase in the essential amino acids content, especially lysine, which helps maintain proper growth by aiding the body in the absorption of calcium (Besrat *et al.* 1979; Steinkraus 1996: 262).

Gamo women cook many different types of enset breads on ceramic baking plates (*bache*), such as *enchila* (highland name) or *kashca* (lowland name), which is made from fermented enset mixed with barley, wheat, or sorghum flour. Women form the *enchila*/*kashca* into round shapes, and to prevent them from sticking to the vessel wall, the cooking jar is lined with enset leaves.

While Ethiopian women produce a number of fermented foods for daily meals, such as *uncha*, they also prepare foods for feasts such as beer (*farso*). As in many African societies, the Gamo consider beer, usually made from barley, as a highly desirable luxury food that binds people together socially and serves to reinforce hospitality during ceremonial and everyday activities (Arthur 2002, 2003). Beer in Gamo society is tied to wealth, power, fertility, and the ancestors.

In Ethiopia, women utilize a number of crops to make beer including wheat, barley, maize, sorghum, and finger millet. The Gamo produce beer using both groundstones and pottery vessels. The malt process begins by soaking the grains in a large pot of water, usually a large bowl (*shele*) or jar (*otto* or *batsa*), for 1 day. After a day, a woman will pour the water out but leave the wet grains in the pot for three more days to begin germination. After the grains have germinated, a woman will take the grains out of the pot and place them in a sunny area to dry. Once dry, she will grind the grains twice, first using the large, coarse groundstone (*bootsa wootza*) and then the smaller, finer groundstone (*lefay wootza*). Finally, a woman will roast the grain on a large ceramic plate (*bache*). After roasting, she will move the grain to a large jar (*otto* or *batsa*) and mix with water, ginger, garlic, and pepper for boiling. After, the beer is left for 5 days to ferment, and then eventually, a woven sieve (*zizarey*) is used to filter the beer before it is consumed. Beer production and consumption defines the Gamo caste system as a food that reinforces unity among the *mala*, but also excludes artisans from being able to process and consume its benefits.

Gamo Caste and Indicators of Food Processing

The art of processing meals by Gamo women for family and community members requires a complex suite of groundstone and pottery types. However, not all Gamo members can afford the variety of tools that Gamo artisans produce. The *diversity* of culinary tools and foods mirrors the differential access of Gamo artisans and farmers to luxury foods.

Groundstone Use

The Gamo use groundstones to grind coffee, grains, and spices, but my ethnoarchaeological study indicates socioeconomic culinary differences between caste groups, such that artisans have fewer and less variation in their groundstone assemblages. The ecological differences in the Gamo highlands influence the types of crops women will process, and this is evident in the grinding of coffee beans in Zuza compared to Etello and Guyla. Zuza women use 19 different groundstones among the 20 households inventoried for grinding coffee, compared to only one groundstone in Guyla and none in Etello for grinding coffee. Coffee grows on the escarpment of the Rift Valley where Zuza is located, and coffee trees abound as you walk through the village. Even though coffee was domesticated in Ethiopia and is one of the largest cash crops, it remains expensive for the typical subsistence farmer (Ehui and Pender 2005; Fuller and Hildebrand 2013).

The processing of foods for meals begins with the use of groundstones, an excellent signifier of social differences and diet variation. Thus, we see that not only do the lower caste households have fewer groundstones, but that the artisan castes in most cases are grinding fewer types of grains (Table 4). An example of this are the Zuza potters, who only use one groundstone for processing food and use the remaining ones to grind their clays and to compact the large baking plates (*bache*). In the case of the Etello *degala*, they have only two groundstones and are grinding far fewer crops than the *mala* living in each of the three communities. The Etello *degala* use one of their groundstones to

Table 4 Gamo groundstone use by community and caste

Community/caste summary statistics	Average foods/house for groundstone processing	Average groundstone/ house	Average grain/ house[a]	Average nongrain/ house[b]
Zuza/*mala* (*n*=46)	4.5	2.7	6.9	1.6
Zuza/*mana* (*n*=5)	1.6	1.6	1.3	0.3
Etello/*mala* (*n*=28)	4.6	1.8	3.7	1.2
Etello/*degala* (*n*=2)	1.6	0.6	1.0	0.6
Guyla/*mala* (*n*=24)	5.9	1.7	4.7	2.0
Guyla/*mana* (*n*=3)	4.0	1.0	2.6	1.3
Guyla/*degala* (*n*=4)	5.9	1.3	4.3	2.0

[a] Grains = barley, wheat, sorghum, corn, and teff

[b] Nongrains = enset, *koltzo*, coffee, beans, peas, pepper

grind only pepper, and the other performs the first and second grind for corn, wheat, and *koltzo* (an indigenous crop). The Etello hideworkers are not processing barley within their households, which is remarkable given that Etello is at an elevation where barley is usually one of the predominant crops grown. In contrast, the Guyla *degala*, who were given farmland during the Ethiopian Derg period, have elevated their wealth above their neighboring *mana* and *degala* living in other communities. The Guyla *degala* are grinding the same amount of foods, especially nongrains, and have almost as many groundstones per house as the Guyla *mala* (Table 4). Juxtaposed with the Guyla *degala* are the Guyla *mana*, who do not own adequate farming land. The Guyla *mana* process almost half the number of grain types with their groundstones (barley, wheat, sorghum, corn, and teff), as well as nongrains (enset, *koltzo*, coffee, beans, peas, and peppers) grown in Gamo. Thus, when families have not been allocated land recently by the federal, regional, or local governments, the diversity of crops processed on household groundstones are a definitive indicator of Gamo caste hierarchy, based on the data from Table 4. Furthermore, the average number of groundstones and foods processed on household groundstones indicates that artisan families have fewer groundstones and fewer types of them than the *mala*, which results in artisans having a less diverse diet than *mala* families. Groundstone use in association with macrobotanical evidence may be a direct archaeological indicator of status and wealth. Thus, archaeologically, we should expect to find both a lower groundstone and grain diversity in households with a lower socioeconomic standing.

Pottery Use

When women finish using their groundstones, they begin to make their meals using pottery to prepare their luxury foods of meat, milk, butter, and beer, and we continue to see regional and socioeconomic variation. *Mala* households have more ceramic vessels and a higher diversity of vessels especially associated with processing luxury foods. In addition, there is variation between the three communities; for example, both meat and chicken *wats* are more popular in Zuza than in Etello or Guyla. The Zuza household assemblages bear this out with a higher number of wide-mouth medium jars (*distes*) found in Zuza used for cooking *wats* than in Etello or Guyla (Arthur 2006: 76). However, in Etello and Guyla, where they grow barley and wheat, there is a higher rate of rich porridges than in Zuza. Guyla, known for the production of beer jars (*batsa*) in Gamo, has a higher rate of vessel use for beer production (28.2 %) compared to Etello (21.2 %), and especially Zuza (16.2 %). Guyla, located in the heart of the barley and wheat agroecozone, specializes in beer jar production.

The three Gamo communities are indicative of how household diet is an expression of the caste hierarchy and can be witnessed in the use of household pots for daily meals. However, Gamo caste hierarchy is not homogeneous; the three communities reflect intra- and intercaste differences. For example in Etello, pots and their associated use of luxury foods of meat, milk, butter, and beer reflect severe wealth differences between the *mala* and *degala* households; but Guyla *degala* are eating more diverse luxury foods than the Etello *degala*. Zuza *mala* members are eating a more diverse luxury diet than the Zuza *mana*, but the differences are not as great as in Etello or Guyla, because Zuza is a more geriatric community with many widows and households relying on weaving as a livelihood rather than farming. Thus, caste hierarchy is not homogeneous

in Gamo and how individual families are eating is an expression of wealth and status at local and regional scales.

In Zuza, the *mana* potters, who have no farmland and live in a restricted space on the edge of the escarpment, eat no foods made with butter and have a less varied diet of meat and beer than the Zuza *mala*. However, the Zuza potters use a large number of their pots for cooking and serving *gumfo* (grain porridge with milk). The majority of luxury foods the Zuza *mala* subsist on are *wats* made from beef and chicken, *gumfo*, and beer. The greater diversity of pottery types is associated with more luxury foods and, thus, is a powerful archaeological signifier of wealth and status (Tables 5 and 6).

Caste hierarchy in Etello is clearly marked with the *degala* hideworkers eating a less varied diet and relying mostly on the carbohydrates of boiled potatoes and enset. This is evident in the Etello *degala* owning no coffee pitchers, baking plates, narrow-mouth small jars, beer jars, or serving dishes. In contrast, the Etello *mala* have a diverse diet and own the full range of pottery types, with meals made from meat, milk, or butter, and are producing and drinking a considerable amount of beer. The majority of meals eaten by the Etello *mala* are porridge foods consisting of *shona* and *gordo*, but they are also making butter and storing both milk and butter. Meals with meat are far fewer than what the Zuza *mala* are consuming (Tables 5 and 6).

The community of Guyla reveals the intricacies of the caste system as the Guyla *degala*, have the same hierarchal standing as the Etello *degala* but the Guyla *degala* residents have more wealth. The Guyla *degala* have farmland, whereas the Etello *degala* do not, and have to make their living by scraping hides contracted out by the *mala*. Therefore, the Guyla *degala* are able to eat a more diversified luxury diet of meat, milk, butter, and also beer. The majority of luxury foods parallel that in other high-caste households: rich porridges of *gumfo*, *shona*, or *gordo*. Although the *degala* have the lowest status in Gamo, those in Guyla are using just over a third of their household assemblage to prepare these rich, luxury meals and own many of the pottery types to produce high-status, luxury foods. The Guyla *mana* have as much variation in their diet as the Guyla *degala*, but are using 21 % of their household assemblage to prepare these foods compared to their *degala* (37.7 %) and *mala* (37.9 %) neighbors (Tables 5 and 6).

The wealthiest households of Guyla are the *mala*, who have the most diverse diet of luxury foods of the three communities. These foods range from making butter and storing milk and butter, to eating meat, to having a rich diet of grain porridges made with milk. Similar to their *degala* neighbors, the *mala* are using just over one-third of their household pottery assemblage to prepare these rich meals made from meat, milk, or butter. The Guyla *mala* have the highest number of pots to prepare beer than any other caste group from the three communities (Tables 5 and 6). The Gamo's production and use of groundstones and pottery are clear indicators of their caste system and the use of ethnoarchaeology enhances the archaeological identification of status.

Ethnoarchaeological Indicators of Status

The onus is on us, as ethnoarchaeologists, to define attributes of status that may be visible in the archaeological record. The Gamo case study exemplifies social stratification through an analysis of culinary material culture. Furthermore, this study provides

Table 5 Gamo pottery use of luxury foods by community and caste

Community/caste summary statistics	Function	Pot frequency
Zuza/*mala* (*n*=309)		
45 pots used for luxury foods	Boil meat	5
2.64 pots/household	Cook meat *wat*	13
14.5 % of pots in caste assemblage	Drink meat juice	1
9 different luxury foods	Cook chicken *wat*	7
12 different luxury food functions	Store milk	2
	Boil milk	1
	Cook *shona*	9
	Serve *gordo*	3
	Serve *shona*	7
	Make and store butter	1
	Cook cattle small intestine with butter	1
	Drink cattle small intestine with butter	2
Zuza/*mana* (*n*=38)		
13 pots used for luxury foods	Boil meat	1
4.3 pots/household	Cook meat *wat*	2
34.2 % of pots in caste assemblage	Serve *shona*	7
3 different luxury foods	Cook *shona*	4
4 different luxury food functions		
Etello/*mala* (*n*=202)		
76 pots used for luxury foods	Cook meat *wat*	3
4.5 pots/household	Serve meat	1
37.6 % of pots in caste assemblage	Store milk	5
7 different luxury foods	Serve *gabula*	5
11 different luxury food functions	Drink milk	4
	Collect milk	2
	Cook *shona*	23
	Serve *gordo*	25
	Serve *shona*	16
	Cook *gordo*	3
	Make and store butter	3
Etello/*degala* (*n*=20)		
2 pots used for luxury foods	Cook meat *wat*	1
0.6 pots/household	Cook *shona*	1
10 % of pots in caste assemblage		
2 different luxury foods		
2 different luxury food functions		
Guyla/*mala* (*n*=366)		
139 pots used for luxury foods	Boil meat	1
9.9 pots per household	Cook meat *wat*	5
37.9 % of pots in caste assemblage	Serve meat	7

Table 5 (continued)

Community/caste summary statistics	Function	Pot frequency
8 different luxury foods	Serve meat with *enjera*	1
16 different luxury food functions	Serve meat with unleavened bread	1
	Store milk	13
	Serve *gabula*	9
	Drink milk	16
	Collect milk	7
	Cook *shona*	44
	Serve *gordo*	17
	Serve *shona*	29
	Cook *gordo*	5
	Serve *gordo*	1
	Make and store butter	10
	Boil butter	1
Guyla/*mana* (n=71)		
15 pots used for luxury foods	Cook meat *wat*	2
5.0 pots per household	Store milk	1
21 % of pots in caste assemblage	Cook *shona*	5
5 different luxury foods	Serve *gordo*	1
7 different luxury food functions	Serve *shona*	5
	Cook *gordo*	1
	Make and store butter	1
Guyla/*degala* (n=53)		
20 pots used for luxury foods	Boil meat	1
6.7 pots per household	Serve *gabula*	2
37.7 % of pots in caste assemblage	Cook *shona*	7
5 different luxury foods	Serve *gordo*	3
6 different luxury food functions	Serve *shona*	9
	Make and store butter	1

markers to identify what was processed in pots and groundstones with the advent of residue analyses and, for pots specifically, use-alteration research.

Groundstones are an essential culinary tool for processing foods, and the Gamo case study indicates a clear distinction between caste groups in the average number of groundstones and their use (Table 4). However, this necessary implement does not receive the attention that it should in an African context (see D'Andrea and Haile 2002; David 1998; Hamon and Le Gall 2013; McIntosh 1995; Phillipson 2012; Roux 1985; Egziabher *et al.* 1993 as exceptions), whereas other regions such as the Americas and the Near East have long focused on groundstone analyses (*i.e.*, Abramiuk and Meurer 2006; Adams 1999, 2002; Basgall 2008; Bizkowski 2008; Buonasera 2007; Hayden 1987; Horsfall 1987; Jackson 1991; Piperno *et al.* 2004; Schneider and LaPorta 2008; Searcy 2011; Wright 1994, 2008). Residue and use-wear analyses are methods that can

Table 6 Gamo pottery use of beer by community and caste

Community/caste	Function	Pot frequency
Zuza/*mala* (*n*=309)		
54 pots used for beer processing	Store beer	24
3.17 pots/household	Carry beer to market	14
17.5 % of pots in caste assemblage	Cook beer	7
8 different beer functions	Store beer during holiday	2
	Store beer during wet season	1
	Transfer beer	1
	Cool beer	1
Zuza/*mana* (*n*=38)		
2 pots used for beer processing	Cook beer	2
0.6 pots/household		
5.3 % of pots in caste assemblage		
1 different beer function		
Etello/*mala* (*n*=202)		
46 pots used for beer processing	Store beer	25
2.70 pots/household	Cook beer	12
22.7 % of pots in caste assemblage	Drink beer	6
7 different beer functions	Cool beer	3
	Mix barley and maize	1
	Carry beer to wedding	1
Etello/*degala* (*n*=20)		
1 pots used for beer processing	Store beer	1
0.33 pots/household		
5 % of pots in caste assemblage		
1 different function		
Guyla/*mala* (*n*=366)		
123 pots used for beer processing	Store beer	36
8.8 pots/household	Cook beer	44
33.6 % of pots in caste assemblage	Drink beer	21
10 different beer functions	Cool beer	18
	Store beer during holiday	3
	Take beer to husband in field	3
	Mix barley and maize	2
	Serve beer	2
	Drink beer during planting time	1
	Transfer beer	1
Guyla/*mana* (*n*=71)		
7 pots used for beer processing	Store beer	1
2.3 pots/household	Cook beer	3
9.8 % of pots in caste assemblage	Cool beer	2
4 different beer functions	Drink beer	1

Table 6 (continued)

Community/caste	Function	Pot frequency
Guyla/*degala* (n=53)		
8 pots used for beer processing	Store beer	2
2.6 pots/household	Cook beer	4
15.1 % of pots in caste assemblage	Cool beer	1
4 different beer functions	Drink beer	1

bridge and compare what is witnessed through the ethnoarchaeological lens and the groundstones found in an archaeological context.

Various methods are being employed to determine groundstone use such as use-wear (Adams 2002: 27–40; Dubreuil 2004) and residue analysis (Buonasera 2007; Li *et al.* 2013; Quigg *et al.* 2001; Pearsall *et al.* 2004; Piperno *et al.* 2009). Residues in the form of phytoliths (Pearsall *et al.* 2004; Piperno *et al.* 2009), lipids (Buonasera 2007; Quigg *et al.* 2001), and starch grains (Li *et al.* 2013; Piperno *et al.* 2000, 2004) are common methods of determining what plant was processed. Specific biomarkers are necessary to identify particular residues and given that the southern Ethiopian farming complex contains defined grains and root crops, a reliable test of the biomarkers seems feasible. Use-wear on groundstones has also been applied to determine what was being processed with them (Adams 1989, 2002: 27–40; Dubreuil 2004). Although use wear studies cannot identify a specific plant type the person was processing, this method can identify not only if the person was grinding grains, but more importantly how groundstone use changed over time (see Dubreuil 2004). However, use-wear studies on groundstones remains a less established method compared to residue analysis (Dubreuil 2004).

Pottery use-alteration research has not been widely used in African archaeology (*e.g.*, Arthur 2000, 2002, 2003; Reid and Young 2000). However, use-alteration is an attribute that should be as imperative, as decorative traits and used in conjunction with morphological analysis, and spatial context can inform the archaeologist how the vessel functioned in the past. Ethnoarchaeological studies of ceramic use have proven vital for revealing specific use-alteration patterns, such as carbon deposits and surface abrasions on ceramic vessels that represent specific types of food processing (Arthur 2000, 2002, 2003; Kobayashi 1994; Skibo 1992). The Gamo caste hierarchy influences the Gamo diet depending on an individual's caste status, and an analysis of ceramic use-alteration may provide an avenue for identifying socioeconomic status (Arthur 2000: 211).

Specific use-alteration patterns were found on a number of Gamo cooking vessels. Here I address specifically pottery vessels related to the processing of luxury foods. The type of carbon deposition on the vessel's exterior is a result of whether the women were boiling or dry cooking their foods (Skibo 1992: 152–168; Skibo and Blinman 1999: 179–182). Dry cooking, without water, leaves a dull soot on the vessel's exterior. However, if the woman was boiling foods in a cooking vessel such as the *diste*, *tsua*, *tsaro*, *otto*, or *batsa*, then the vessel will exhibit a glossy soot on the exterior surface, from the base to the upper body, caused by the water cooling the pot's surface (Fig. 19). Luxury foods such as *wat* stews and *shona* will have this type of use-alteration

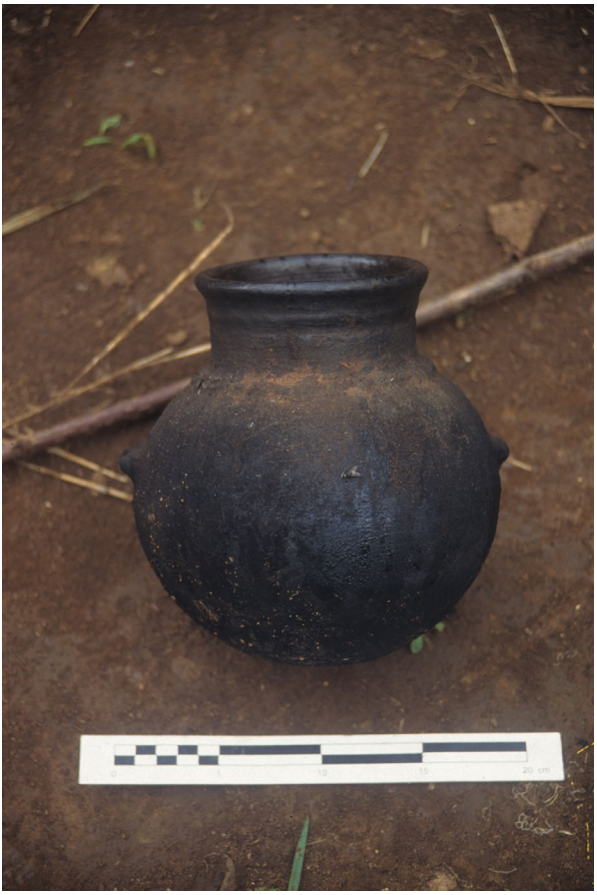

Fig. 19 A *tsua* pot showing a wet mode of cooking with an exterior glossy soot

signature. However, Gamo vessels are multifunctional and women will cook nonluxury foods in the same pot in which they cook meats and foods that require milk and butter. The Gamo analysis found that an additional use-alteration attribute can disentangle the dilemma of multifunctional pots by analyzing the interior surface attrition.

Luxury foods (*i.e.*, grains, milk, and butter) and nonluxury foods (*i.e.*, enset and potatoes) prepared and consumed by the Gamo cause surface attrition (Arthur 2002: 339). Of the 1,058 pots that I recorded, 276 food-processing vessels (26.1 %) contained interior surface attrition. A majority of the vessels (79.7 %) were multifunctional pots that women use for cooking luxury and nonluxury meals. Although enset and potatoes are nonluxury foods, only 5.8 % of the vessels with surface attrition were used only for processing these two types of foods. Luxury foods of grains and dairy are associated with the majority of vessels (94.2 %) that have interior surface attrition. The location of attrition is from the interior's base to the maximum diameter or upper body of the vessel and occurs on almost two-thirds (65.2 %) of the pots women were using to cook or serve luxury foods.

The strong relationship between Gamo wealth and ritual-sacrificers to beer is well established (Arthur 2002, 2003). The Gamo caste system should also have a strong

relationship with beer since the farmland, grains, material culture, and labor are under the control of the Gamo *mala* caste. The processing and drinking of beer may have been a culinary symbol of rank and status, differentiating between the elite and nonelite (Haaland 2012). Beer is a central element in the construction of ritual and social distinctions, stated clearly by Randi Haaland (2012: 34): "Beer serves both as a sense of communal identity for those drinking together and as a sense of differences and boundaries from others." In Gamo, sponsoring a feast is expensive in terms of labor, crop resources, and the purchase of culinary tools to process grains into beer, especially when a typical feast requires up to 2,000 liters of beer. If an individual is from the *mala* caste with wealth and respect in the community, and his father is deceased, then the community will select this man and make him a *halaka* or ritual-sacrificer in order to redistribute his wealth. The Gamo believe that the *halaka* symbolically brings the community together and creates fertility for his people by redistributing his wealth in two beer feasts (Freeman 2002: 83–113). While the feasts are an integral part of Gamo religion, wealth, status, power, and fertility, it is the human labor, resources, and an analysis of the operational chains of food and the life history of the culinary tools that have a higher chance to be archaeologically interpreted (Adams 2004: 56; Jennings *et al.* 2005: 275–276, 288; Spielmann 2002: 197). The wealthy, high-caste families are the ones who also are producing beer for daily use for their family members or to sell at one of the weekly Gamo markets. As a food, it is these families that are able to consume unfiltered beer and have the nutritional benefits by having a higher level of protein and B-vitamin content than unleavened bread (McGovern 2009: 244). Beer consumption has been linked to increasing the health of individuals during the X-Group period in Sudanese Nubia with the finding of the antibiotic tetracycline in the bones of individuals, caused when the grain became contaminated with the bacteria streptomyces, which produces tetracycline (Armelagos *et al.* 2001). Individuals belonging to the high-caste Gamo are similar to other southern Ethiopian societies in relying on beer as a daily food; especially during the dry season, it is common for an average worker in southern Ethiopia to consume three to five gourds (1–2 liters) of beer per day (Abegaz *et al.* 2002: 62).

While organic residues continue to provide an important method for confirming the earliest known beer production (Edwards 1996; McGovern 2009: 241–250; Michel *et al.* 1992), surface attrition on the interior of Gamo vessels is a direct indicator of beer processing. Furthermore, surface attrition used in conjunction with the analysis of vessel morphology can be a productive application in documenting beer production and consumption. High-caste families in the Gamo *mala* caste group have access to farmland to produce grains to then produce beer, and they have the economic wealth to purchase the necessary culinary tools (*i.e.*, groundstones and beer jars). Differences in vessel types allow for a distinction between luxury foods, with Gamo women using bowls and small jars for cooking and serving luxury foods of meat, milk, and butter, whereas women will select large jars for fermenting beer (Arthur 2002). The placement of the surface attrition is also important. The jars and bowls used in grain and dairy processing are eroded from the base to the upper body. The beer jars have extreme erosion from the base all the way to the edge of the rim and sometimes even on the exterior portion of the rim and neck (Fig. 20). Thus, use-alteration attributes are a reflection of the Gamo caste distinctions.

Fig. 20 A former beer pot with extreme interior surface attrition used to store surplus grains

Conclusion

The Gamo and their strict social hierarchy offer us access for understanding how the caste system manifests itself in material culture. Artisans such as groundstone makers and potters rely primarily on craft production for their livelihood. In most parts of the world, traditional crafts are becoming less of an option, since mechanized mills and metals and plastics are becoming more common. However, in the Gamo region, groundstone and pottery production is done by full-time craft specialists, and the use of these culinary tools remains ubiquitous in every household. The production and distribution of both groundstones and pots is an arduous and perilous life, with groundstone makers having to traverse the steep Rift Valley escarpment for suitable stone, and potters risking collapse of their clay mines. However, once the groundstones and pottery vessels reach the consumer households, they are signifiers of the Gamo diet and thus reflect the social, economic, and ritual life of the Gamo. This study is applicable to many Ethiopian societies with hierarchal divisions and where artisans do not have equal access to social, economic, and political rights (Cassiers 1975; Cerulli 1956; Haberland 1984; Hallpike 1968; Lewis 1970; Shack 1964; Todd 1978).

Gamo women prepare a suite of meals with a vast array of ingredients which may or may not be fermented. Diet is influenced by the ecological setting as well as social status. Groundstones and pottery present a strong reflection of the ecological location of a community. For example, coffee beans are ground on Zuza groundstones at a much higher frequency than in the highland communities of Etello or Guyla. Furthermore, pottery use indicates that people living in Zuza are eating more meals with meat, especially stew/*wats*, and the highland communities of Etello and Guyla are eating more porridges made from grains.

The daily use of groundstones and pots is a window into the caste social order, with the high-caste *mala* having more access to luxury foods of meat, milk, butter, and beer. Groundstone frequency and the variety of foods processed on the groundstones are strong indicators of caste. Caste is not homogenous in Gamo, but overall, household pottery assemblages make for strong indicators of caste, especially with meals made from luxury foods. The variation in luxury foods and the frequency of pots used to cook them are the strongest indicators of caste.

The analyses of culinary tools should allow us as archaeologists to address the social context of daily meals, rituals, and feasting. The analysis of kitchen tools with a focus on their use will promote our understanding of the complexities of daily cooking and how it relates to a culture's multiple identities. My hope is that archaeologists will begin to utilize groundstones more in their analysis, rather than discard them or place them in the "other" category, because researchers are concerned about their weight and bulk in transporting and curation (see Rowan and Ebeling 2008: 2–3; Searcy 2011: 4–6). We cannot rely on macrobotanical evidence alone to determine dietary changes, as recent research on residues found on groundstones indicates (Piperno *et al.* 2000, 2009). Therefore, by combining macrobotanical and groundstone residue analysis, we will be able to understand more fully ancient foodways and their relation to social status. Another goal is for archaeologists to employ use-alteration analysis on pots, and for this to be as common as the study of stylistic attributes, because use-alteration can inform us about the pot's actual use (Skibo 2013: 4). The integration of culinary tools with these types of analyses will lead to an enhanced view of identity, subsistence, status, and wealth.

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