# Building life histories of Cape Town's enslaved, 1700-1850

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2018

***document version***
Publisher's PDF, also known as Version of record

***citation for published version (APA)***
Mbeki, L. (2018). *Building life histories of Cape Town's enslaved, 1700-1850: an archival and isotopic study*. [PhD-Thesis - Research and graduation internal, Vrije Universiteit Amsterdam].

# *Chapter 7*

## What was cooking at the colonial Cape?
## A CN isotope baseline study

## Introduction

There is now a growing body of bioarchaeological research on Cape Town, a significant node in the transportation networks of both the Indian and Atlantic oceanic slave trades, attempting to shed like on the lives of enslaved persons (Cox and Sealy, 1997; Cox *et al.*, 2001; Kootker *et al.*, 2016; Mbeki *et al.*, 2017). Enslaved persons destined for the Brazilian market were identified at the site of Fort Knokke on the Cape foreshore (Cox and Sealy, 1997). Cox *et al.* (2001) used changes in $\delta^{13}C$ and $\delta^{15}N$ values of different skeletal elements of the Cobern Street individuals to recreate life histories. Building on this study, Kootker *et al.* (2016) employed a dual $^{87}Sr/^{86}Sr$-$\delta^{13}C$ isotopic approach in conjunction with the presence of cultural markers to identify migration events experienced by enslaved persons. Mbeki *et al.*, (2017) combined osteological data with stable and radiogenic isotope systems to identify first generation migrants to Cape Town in a changing social landscape, and to further contextualise the V & A Marina Residence archaeological site. Similar research has been carried out on enslaved individuals traded in the Atlantic Ocean world (Bastos *et al.*, 2016; Goodman *et al.*, 2009; Laffoon *et al.*, 2012, 2018; Nystrom *et al.*, 2011; Schroeder *et al.*, 2009, 2014).

Although the Cape-focussed studies used the carbon and nitrogen isotope systems as proxies for diet and migration, there was no comprehensive reference baseline data, essential for assessment of palaeodiet for comparison. This paper, therefore, presents a crucial carbon and nitrogen isotope baseline dataset representative of the Cape colonial diet. The faunal remains analysed to generate this dataset were excavated at the Castle of Good Hope in central Cape Town. Although these remains were determined not have been situated in their primary context, they are indicative of the protein sources available at the colonial Cape.

## Archaeological setting

The faunal assemblage analysed for this study is an aggregate of animal bones excavated at the Castle of Good hope (1978-1992) and curated by Iziko Museums. The Castle of Good Hope, the oldest building in South Africa, was built between 1666 and 1679 as a fort during a time when the early Dutch settlement was vulnerable to attack by European powers with competing mercantile interests. This pentagonal structure surrounded by a moat was a microcosm of the colonial society that developed at The Cape, housing the settlement's highest-ranking VOC official, the governor, as well as lowly soldiers and sailors. A granary, prison cells and a church were also found within its walls.

Several modifications have been identified from archaeological excavations and from the VOC's extensive written record. For instance, the moat was partially filled with garbage in the

18th century (ACO, 1996). Periodic flooding in the Castle due to the high water table was a constant worry during both the Dutch and British periods and resulted in raising of floor levels with cultural material-containing fill (ACO, 1991; ACO, 1999; Heinrich, 2011).

## Archaeozoological aspects of Cape diet

In order to create a meaningful dietary baseline, it is necessary to understand animal husbandry. A major contribution to the current understanding of the meat industry and diet at the colonial Cape has been made by Heinrich (2010, 2011). The essential findings of his zooarchaeological study from three assemblages from the Castle of Good Hope are presented below. Although no faunal remains have been found in a primary context that can conclusively be associated with Cape slaves, urban assemblages from several secondary contexts can illustrate the range of foods available for consumption at the colonial Cape.

In the early years of the colony, the colonists relied heavily on mutton for their own consumption and provisioning of passing ships as the indigenous Khoikhoi were reluctant to trade their cattle, which represented both economic and social capital. Company employees released from service, known as *vrijburghers,* could win contracts to supply the Dutch East India Company (VOC) with meat (mainly mutton and beef). Through breeding, trade, and theft from the Khoi, who grazed and traded their animals further inland, the *burghers*' herds grew. Sheep consistently outnumbered cattle by several multiples during the Dutch period. Breeding of imported exotic cattle breeds was unsuccessful and the colony was to remain dependant on the indigenous variety, which was considered to be of poor quality, for draught and meat.

Pork was also consumed at The Cape but not in great quantities. Exotic rabbits were introduced to the colony which already had indigenous rabbits. Chicken, geese, ducks (and other domestic fowl) were also introduced to The Cape by the Company. Game, including wild birds such as penguin and ostrich, were hunted by low ranking VOC employees, particularly when food was scarce. Salted meats were imported from Europe to The Cape where they were popular. Game caught at VOC outposts would often be salted before transportation back to Cape Town, as would ocean-caught fish.

Slaves were heavily reliant on fish as a source of protein. In time, when the beef and mutton supply became more stable, many types of fish would be looked down upon as low class or slave food. This limited variety and the influence of Eastern slaves in an African context gave birth to the creole Cape Malay cuisine that includes curries and pickled fish (Baderoon, 2007). Socio-economic factors trumped religious law when it came to a debate over the consumption of crayfish by Cape Muslims in the 19th century. One school of Islamic thought categorised this shellfish as carrion and thus haraam (unlawful/forbidden), however as former slaves and part of the urban poor, Cape Muslims relied heavily on crayfish and fish such as snoek (ibid). To this day "In the Cape (West Coast) region of South Africa, snoek is an important source of readily available and affordable protein to many medium- and low-income households" (Henning and Hoffman, 2017:1).

The importance of affordable marine resources to the urban poor diet is also illustrated in older texts. The small Chinese community at The Cape was described by Mentzel as "expert fishermen as well as good cooks" who ran eateries. He goes on to state that "Fried or pickled fish with boiled rice is well-favoured by soldiers, sailors and slaves [moreover] When the fierce North-Westers blow, crayfish, crabs, seaspiders and 'granelen' are cast ashore. They are jealously collected by these Orientals, cooked and sold" (Mentzel in Armstrong, 2012:114).

## Human dietary assessment

The stable isotopes of carbon and nitrogen are the preferred systems for palaeodietary assessment. The ratio $^{15}N/^{14}N$ ($\delta^{15}N$) identifies a consumer's trophic level which is on average 3-5‰ greater than its diet allowing for a distinction to be made between herbivores, omnivores and carnivores. Marine ecosystems display relatively high $\delta^{15}N$ values as the base of the food chain is enriched in $^{15}N$ compared to its terrestrial analogue due to a difference in nitrogen source (dissolved nitrates vs. atmospheric/soil nitrogen -Schoeninger and DeNiro, 1984). Moreover, the marine food chain has more trophic levels, also resulting in elevated $\delta^{15}N$ values (Lee-Thorp, 2008; Schwarcz and Schoeninger, 2011). Other trophic level-independent factors may contribute to variation in $\delta^{15}N$ values such as nutritional and water stress, and consumption of salted foods. These factors in particular would be important considerations when interpreting Cape enslaved individuals' isotopic values.

Differences in $^{13}C/^{12}C$ ($\delta^{13}C$) are directly related to the manner in which plants metabolised atmospheric $CO_2$. Plants are separated into three categories based on the photosynthetic pathway they use to fix $CO_2$. The most significant of these are the Calvin ($C_3$) and Hatch and Slack ($C_4$) which use ribulose bisphophate carboxylase/oxygenase (RuBisCO) and phosphoenolpyruvate carboxylase (PEP) enzymes respectively for the fixation of $CO_2$ (Calvin and Benson, 1948; Farquhar, 1983; Hatch and Slack, 1966; Marshall *et al.*, 2008). As a result of these differences, $C_3$ plants have lower $\delta^{13}C$ values than $C_4$ plants. Intermediate $\delta^{13}C$ values are evident in marine plants as the $CO_2$ in marine environments is derived from $^{13}C$-enriched dissolved bicarbonate ($HCO_3^-$). These isotopic differences are systematically propagated up the food chain.

# Material and methods

## Material selection

A large variety of taxa were chosen to generate a broad baseline and to be as representative as possible of the colonial Cape diet, hence sixty samples representing 23 species (mammalia, aves and pisces) were collected (**Table 9**). To obtain the highest minimum number of individuals (MNI), the same skeletal element of the same symmetry was selected per species. In case this approach was not feasible, skeletal elements of the same species with different morphological features, and/or metric dimensions were selected to avoid the selection of intra-individual elements.

**Table 9**: Taxa selected from the Castle of Good Hope faunal assemblage

| Class | Common Name | Taxon | N |
|---|---|---|---|
| Mammal | Cat | *Felis catus* | 1 |
| | Cattle | *Bos Taurus* | 10 |
| | Dog | *Canis lupus familiaris* | 4 |
| | Hyena | *Hyaenidae sp.* | 1 |
| | Pig | *Sus domesticus* | 3 |
| | Rabbit | *Oryctolagus cuniculus* | 2 |
| | Sheep/goat | *Ovis aries/Capra hircus* | 11 |
| | | | **32** |
| Aves | Bustard | *Otididae* | 1 |
| | Cape cormorant | *Phalacrocorax capensis* | 1 |
| | Cape francolin | *Pternistis capensis* | 2 |
| | Cape teal | *Anas capensis* | 2 |
| | Chicken | *Gallus gallus domesticus* | 4 |
| | Common greenshank | *Tringa nebularia* | 2 |
| | Crow | *Corvus sp.* | 1 |
| | Domestic duck | *Anas platyrhynchos domesticus* | 2 |
| | Francolin | *Phasianidae* | 2 |
| | Goose | *Anser sp.* | 2 |
| | Pengiun | *Spheniscidae* | 1 |
| | Pigeon | *Columba sp.* | 2 |
| | Raven | *Corvus corax* | 2 |
| | Turkey | *Meleagris gallopavo* | 2 |
| | White breasted cormorant | *Phalacrocorax lucidus* | 1 |
| | | | **27** |
| Pisces | Sea breams/porgies | *Sparidae* | 1 |

## Sampling and analytical details

Following selection of appropriate element, a subsample was taken with a target weight of 5-10 grams using a diamond cut-off wheel on a Dremel Rotary Tool and if needed a coping saw and transferred to the Vrije Universiteit. The samples were carefully cleaned of adherent soil, crushed, and *circa* 300 mg of small bone fragments roughly uniform in size was subsampled and transferred to polypropylene vials (Elkay). The specific collagen extraction protocol employed, and analytical details for carbon and nitrogen isotope analysis are described elsewhere (Mbeki *et al*., 2017). Stable isotopes were measured using an elemental analyser (NC2500; ThermoQuest) coupled to a Delta Plus ThermoQuest Finnigan isotope ratio mass spectrometer at the Vrije Universiteit Amsterdam. For calibration, USGS 40 and USGS 41 were used. The reproducibility of the analyses determined by repeated analysis of an internal standard (Bovine liver, NIST 1577c) was within 0.08‰ for $\delta^{15}N$ and 0.01‰ for $\delta^{13}C$ ($n = 17$). $\delta^{13}C$ is reported relative to standard Vienna PeeDee Belemnite (VPDB) and $\delta^{15}N$ relative to standard Ambient Inhalable Reservoir (AIR).

### Quality indicators

Collagen quality was assessed through four indicators (collagen yield, weight %C, weight %N, and atomic C:N) commonly employed by stable isotope and radiometric dating laboratories worldwide (Pestle *et al*. 2012, 2014).

# Results

## Sample preservation

Despite multiple attempts to extract collagen of reasonable quality, four samples did not possess appreciable amounts of collagen (>0.5 wt%). The remaining 56 (93%) samples had more than the preferred lower threshold values of carbon (13.0 wt% C) and nitrogen (4.8 wt%: Ambrose, 1990). Descriptive statistics of the data are presented below (**Table 10**).

**Table 10:** Descriptive statistics

|  | % Yield | $\delta^{15}N$ | % N | $\delta^{13}C$ | %C | Atomic CN ratio |
|---|---|---|---|---|---|---|
| **Average** | 9.7 | 10.0 | 12.8 | -15.9 | 37.0 | 3.4 |
| **SD** | 5.8 | 2.5 | 1.9 | 3.9 | 5.1 | 0.08 |
| **Min** | 1.7 | 5.1 | 8.5 | -22.2 | 25.0 | 3.2 |
| **Max** | 20.8 | 17.2 | 15.2 | -7.1 | 43.6 | 3.6 |

%N and %C data are plotted against each other below (**Figure 15**). These quality indicators vary proportionally to one another and form a well-defined regression line ($R^2$=0.98). This suggests that the collagen from these samples was not subject to attack by bacteria that target carbon-rich amino acids and retained its integrity (Pestle and Colvard, 2012).

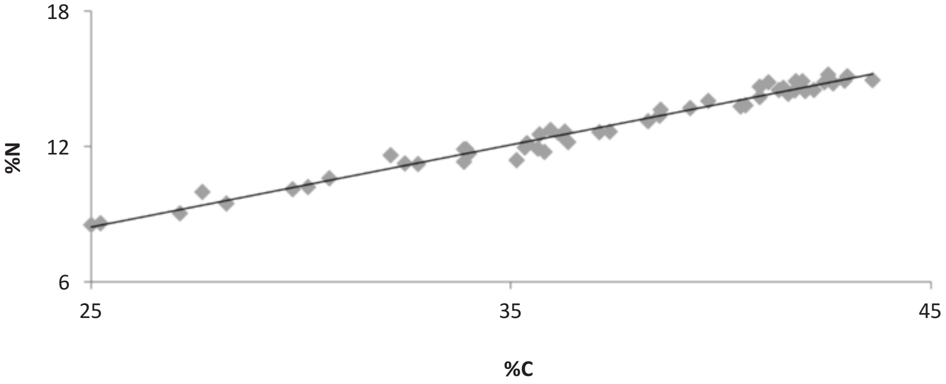

**Figure 15:** %N vs %C showing $R^2$=0.98

## Carbon and nitrogen isotopic data

The collagen data for the 56 samples with acceptable quality indicators is presented below (**Table 11**). Fish bones were scarce in the available archaeological assemblage, only one fish bone was present of the family *Sparidae* (sea bream). Supplementary modern anchovy (*Engraulis capensis*, n = 12) and round herring (*Etrumeus whiteheadi*, n = 5) collagen data are thus included in this study (Sholto-Douglas *et al*., 1991).

**Table 11:** Isotopic data from faunal remains from the Castle of Good Hope dating from the colonial period. Supplementary fish isotopic data from Sholto-Douglas *et al.* (1991)

| VU ID | Class | Taxon | Common Name | % Yield | δ $^{15}$N | % N | δ $^{13}$C | %C | CN ratio | Element | Symmetry | Find number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Aves | *Anas capensis* | Cape teal | 13.2 | 17.2 | 14.5 | -16.1 | 42.2 | 3.4 | Coracoid | Right | - |
| 22 | Aves | *Anas capensis* | Cape teal | 5.1 | 8.9 | 11.8 | -14.9 | 35.8 | 3.6 | Coracoid | Right | - |
| 3 | Aves | *Anas platyrhynchos domesticus* | Domestic duck | 13.3 | 10.6 | 14.6 | -19.2 | 41.5 | 3.3 | Radius | - | - |
| 13 | Aves | *Anser sp.* | Goose | 20.8 | 7.1 | 14.7 | -19.0 | 40.9 | 3.3 | Humerus | Right | - |
| 14 | Aves | *Anser sp.* | Goose | - | 9.6 | 13.1 | -17.0 | 38.3 | 3.4 | Coracoid | Left | - |
| 26 | Aves | *Columba sp.* | Pigeon | 13.4 | 10.4 | 14.3 | -20.3 | 41.6 | 3.4 | Humerus | Right | - |
| 27 | Aves | *Columba sp.* | Pigeon | 16.3 | 9.7 | 11.2 | -19.8 | 32.5 | 3.4 | Humerus | Left | - |
| 4 | Aves | *Corvus corax* | Raven | 12.9 | 10.7 | 14.2 | -17.3 | 40.9 | 3.4 | Coracoid | Left | - |
| 1 | Aves | *Corvus sp.* | Crow | 19.8 | 8.4 | 15.1 | -17.9 | 43.0 | 3.3 | Ulna | Left | - |
| 17 | Aves | *Gallus gallus domesticus* | Chicken | 9.9 | 7.6 | 14.0 | -18.9 | 39.7 | 3.3 | Tibia | Left | - |
| 18 | Aves | *Gallus gallus domesticus* | Chicken | 16.9 | 12.0 | 14.8 | -17.3 | 42.5 | 3.3 | Tibia | Left | - |
| 19 | Aves | *Gallus gallus domesticus* | Chicken | 13.3 | 9.5 | 15.0 | -18.8 | 43.6 | 3.4 | Tibia | Left | - |
| 20 | Aves | *Gallus gallus domesticus* | Chicken | 13.8 | 11.6 | 14.5 | -18.5 | 41.8 | 3.4 | Tibia | Left | - |
| 15 | Aves | *Meleagris gallopavo* | Turkey | 18.8 | 12.7 | 14.9 | -19.6 | 41.8 | 3.3 | Coracoid | Left | - |
| 16 | Aves | *Meleagris gallopavo* | Turkey | 17.9 | 10.9 | 14.5 | -18.2 | 41.4 | 3.3 | Coracoid | Left | - |
| 12 | Aves | *Otididae* | Bustard | 20.8 | 9.1 | 14.8 | -17.1 | 42.7 | 3.4 | Coracoid | Right | - |
| 24 | Aves | *Phalacrocorax capensis* | Cape cormorant | 16.1 | 15.2 | 14.9 | -13.5 | 42.9 | 3.4 | Coracoid | Left | - |
| 25 | Aves | *Phalacrocorax lucidus* | White breasted cormorant | 12.7 | 14.4 | 12.7 | -10.2 | 37.3 | 3.4 | Humerus | Left | - |
| 10 | Aves | *Phasianidae* | Francolin | 14.2 | 6.7 | 14.5 | -21.0 | 42.0 | 3.4 | Coracoid | Right | - |
| 11 | Aves | *Phasianidae* | Francolin | 16.1 | 5.1 | 14.8 | -22.2 | 42.7 | 3.4 | Coracoid | Left | - |

**Table 11:** Continued.

| VU ID | Class | Taxon | Common Name | % Yield | $\delta^{15}N$ | % N | $\delta^{13}C$ | %C | CN ratio | Element | Symmetry | Find number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | Aves | *Pternistis capensis* | Cape francolin | 11.3 | 10.8 | 13.8 | -20.7 | 40.6 | 3.4 | Tibia | Right | - |
| 6 | Aves | *Tringa nebularia* | Common greenshank | 16.8 | 10.3 | 12.6 | -18.1 | 37.1 | 3.4 | Humerus | Right | - |
| 7 | Aves | *Tringa nebularia* | Common greenshank | 11.4 | 12.1 | 13.8 | -20.6 | 40.5 | 3.4 | Humerus | Left | - |
| 46 | Mammal | *Bos Taurus* | Cattle | 11.6 | 8.9 | 11.6 | -9.9 | 32.1 | 3.2 | Calcaneum | Right | 39.4.1 |
| 52 | Mammal | *Bos Taurus* | Cattle | 1.7 | 8.7 | 10.2 | -12.5 | 30.2 | 3.5 | Calcaneum | Left | P.4.34 |
| 53 | Mammal | *Bos Taurus* | Cattle | 3.1 | 10.3 | 8.6 | -9.7 | 25.2 | 3.4 | Calcaneum | Left | K15.4.13 |
| 54 | Mammal | *Bos Taurus* | Cattle | 2.8 | 6.5 | 9.0 | -8.8 | 27.1 | 3.5 | Metatarsus | - | 4.8 |
| 55 | Mammal | *Bos Taurus* | Cattle | 4.4 | 8.0 | 11.2 | -10.6 | 32.8 | 3.4 | Calcaneum | Left | 4.5 |
| 56 | Mammal | *Bos Taurus* | Cattle | 4.5 | 9.1 | 12.7 | -10.3 | 36.3 | 3.4 | Calcaneum | Right | 4.2 |
| 57 | Mammal | *Bos Taurus* | Cattle | 3.3 | 5.4 | 11.9 | -11.7 | 33.9 | 3.3 | Tibia | Left | 4.1 |
| 58 | Mammal | *Bos Taurus* | Cattle | 3.8 | 5.6 | 12.2 | -10.4 | 36.4 | 3.5 | Tibia | Left | P.4.27 |
| 59 | Mammal | *Bos Taurus* | Cattle | 2.3 | 8.1 | 10.1 | -13.0 | 29.8 | 3.4 | Metacarpus | - | 4.7 |
| 60 | Mammal | *Bos Taurus* | Cattle | 2.9 | 7.5 | 11.7 | -7.1 | 34.0 | 3.4 | Tibia | Left | 12.4.4 |
| 44 | Mammal | *Canis lupus familiaris* | Dog | 7.2 | 11.1 | 10.0 | -20.7 | 27.7 | 3.2 | Mandible | Right | - |
| 45 | Mammal | *Canis lupus familiaris* | Dog | 3.8 | 12.6 | 12.1 | -14.1 | 35.4 | 3.4 | Mandible | Left | J10.4.2 |
| 48 | Mammal | *Canis lupus familiaris* | Dog | 3.4 | 10.9 | 11.3 | -20.9 | 33.9 | 3.5 | Mandible | Right | G12.4.8 |
| 49 | Mammal | *Canis lupus familiaris* | Dog | 2.6 | 12.9 | 10.6 | -14.4 | 30.7 | 3.4 | Mandible | Left | TBC |
| 47 | Mammal | *Felis catus* | Cat | 9.1 | 11.5 | 14.9 | -13.8 | 41.1 | 3.2 | Mandible | Left | 7.4.12 |
| 51 | Mammal | *Hyaenidae sp.* | Hyena | 4.2 | 12.2 | 8.5 | -16.5 | 25.0 | 3.4 | Maxilla | Right | 10.4.1 |
| 41 | Mammal | *Oryctolagus cuniculus* | Rabbit | 9.3 | 14.6 | 13.4 | -13.2 | 38.5 | 3.4 | Humerus | Left | P.4.69 |
| 42 | Mammal | *Oryctolagus cuniculus* | Rabbit | 9.2 | 13.2 | 14.5 | -14.5 | 41.5 | 3.3 | Humerus | Left | P.4.73 |

**Table 11:** Continued.

| VU ID | Class | Taxon | Common Name | % Yield | $\delta^{15}N$ | % N | $\delta^{13}C$ | %C | CN ratio | Element | Symmetry | Find number |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 4.9 | 8.3 | 12.0 | -13.5 | 35.3 | 3.5 | Tibia | Left | 4.106 |
| 31 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 3.2 | 7.6 | 11.9 | -19.5 | 35.7 | 3.5 | Tibia | Left | 4.23 |
| 33 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 13.3 | 10.6 | 14.9 | -16.0 | 41.9 | 3.3 | Tibia | Left | 4.4 |
| 34 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 12.4 | 8.8 | 13.6 | -20.1 | 38.6 | 3.3 | Tibia | Left | 4.1.78 |
| 35 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 14.1 | 8.3 | 15.2 | -18.3 | 42.6 | 3.3 | Tibia | Left | 4.204 |
| 36 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 18.3 | 9.4 | 12.7 | -14.1 | 35.9 | 3.3 | Tibia | Left | 4.21 |
| 37 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 2.7 | 7.3 | 13.7 | -11.0 | 39.3 | 3.4 | Tibia | Left | 4.24 |
| 38 | Mammal | *Ovis aries/Capra hircus* | Sheep/goat | 5.6 | 7.2 | 11.9 | -13.3 | 33.9 | 3.3 | Tibia | Left | 4.43 |
| 39 | Mammal | *Sus domesticus* | Pig | 2.1 | 10.2 | 11.4 | -18.8 | 35.1 | 3.6 | Humerus | TBS | 4.2 |
| 40 | Mammal | *Sus domesticus* | Pig | 4.6 | 10.8 | 12.5 | -19.1 | 36.2 | 3.4 | Tibia | Left | 4.3 |
| 50 | Mammal | *Sus domesticus* | Pig | 10.5 | 11.1 | 12.5 | -18.4 | 35.7 | 3.3 | Mandible | Right | T23.4.2 |
| 43 | Pisces | Sparidae | Sea breams/porgies | 4.6 | 12.4 | 9.5 | -11.8 | 28.2 | 3.5 | Os dentale | - | - |
|  |  |  | Anchovy (±1SD) |  | 10.6 |  | -15.1 |  |  |  |  |  |
|  |  |  | SD |  | 0.5 |  | 0.6 |  |  |  |  |  |
|  |  |  | Roundherring (±1SD) |  | 11.3 |  | -14.6 |  |  |  |  |  |
|  |  |  | SD |  | 1.1 |  | 0.9 |  |  |  |  |  |

# Discussion

## Faunal isotope data

The faunal carbon and nitrogen isotope data from this study are plotted in **Figure 16.** Notably, cattle seem to have consumed a mixed $C_3/C_4$ to purely $C_4$ diet. Half the cattle display relatively elevated $\delta^{15}N$ compared to the rest which could be a reflection of grazing in an arid region and the associated water stress. In response to water stress, high-urea-content urine is passed by mammals. Due to fractionation this urea is enriched in the lighter nitrogen isotope, $^{14}N$, and the resulting nitrogen pool in the body is enriched in $^{15}N$ (Ambrose, 1991). It would appear that in general cattle were grazed far inland in a $C_4$ biome. This is in contrast to 3 sheep/goats in the assemblage, some of which display a purely $C_3$ signal consistent with grazing closer to Cape Town. The remaining 4 sheep display a mixed $C_3/C_4$ values suggesting that they, like the cattle, grazed some distance from Cape Town.

As mentioned before, *vrijburghers* in the Cape province grew their herds by breeding, trade and theft from the indigenous Khoi. The two cattle exhibiting purely $C_4$ dietary signals may have been supplied by the Khoi or they may illustrate the extent to which the Dutch colonists laid claim to vast tracts of land formerly used by the Khoi to graze their herds. This would have been in direct response to the demand for fresh meat for passing ships and the rapidly expanding settlement.

Not only is a within-species isotopic variation evident for sheep/goats, it is also evident among animals that would be found in the domestic sphere. Two dogs consumed a purely $C_3$ diet, and plot among the domestic fowl. The other two dogs were omnivorous and consumed a mixed $C_3/C_4$ diet with a significant marine protein contribution indicated by their high $\delta^{15}N$ (~13‰).

The two rabbits in the sample, which one would expect to have consumed a terrestrial diet, display unusually elevated $\delta^{15}N$ (13.2‰ and 14.6‰). Perhaps they were hunted in an arid area, such as that where the cattle were grazed. Another unexpected feature of the dataset is that the hyena, a carnivore, plots in a similar region as the domestic fowl and pigs. The chickens, turkeys, domestic duck, geese and pigs, animals that are raised in domestic spaces, are also enriched in $^{15}N$. The four chickens analysed all consumed a $C_3$ diet, but there was considerable variation in their $\delta^{15}N$ (7.6‰-12.0‰). The elevated $^{15}N$ values of these animals may be the result of consuming plants grown on manured soil. Moreover, if these plants were close to the coast, they would also be subject to seaspray which would also result in elevated $\delta^{15}N$ values. Müldner *et al.* (2014) have suggested that Belgian herbivores with a $\delta^{15}N$ >9‰ were subject to a coastal influence that incorporated seaspray, soil salinity and pH effects on the plants they ate. Soil salinity results in an increase in pH which in turn increase $NH_3$ volatisation and plant uptake of $^{15}N$-enriched $NH_4^+$ (Van Groenigen and Van Kessel, 2002). These factors may also have been at play at The Cape.

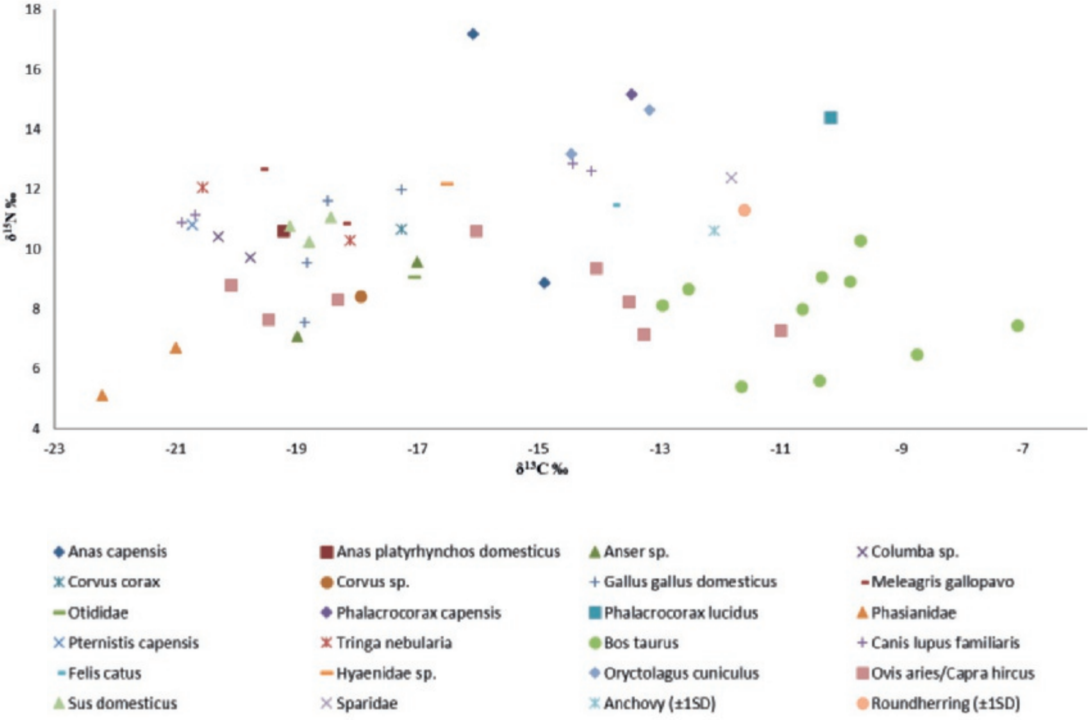

**Figure 16:** $\delta^{13}C$ vs. $\delta^{15}N$ of faunal remains

## Implications for slave diet assessment

To determine which protein sources were major contributors to the diet of enslaved persons at The Cape the average $\delta^{13}C$ and $\delta^{15}N$ values and standard deviations of each taxon are plotted in **Figure 17** along with the average isotope values for the Cobern Street (Cox *et al.*, 2001) and Marina Residence (Mbeki *et al.*, 2017) individuals. We assume that the individuals who were buried at these two sites are representative of the enslaved (privately and Company-owned) and formerly enslaved population at The Cape.

Marine fish such as anchovy could well have been a major source of protein for slaves at The Cape as there is an offset in $\delta^{15}N$ of 3.3‰ between the average anchovy value (10.6‰) and that of the Marina Residence individuals (13.9‰) representing one trophic level. The $\delta^{13}C$ offset of 0.2 also falls within the trophic shift range (0-2‰). The one fish represented in the assemblage, sea bream, does not appear to have contributed significantly to the diet of enslaved people.

The Cobern Street individuals are a trophic level above the average sheep/goat ($\Delta^{15}N$=3.3‰, $\Delta^{13}C$=0.2‰) suggesting that they could have consumed this protein source. The Marina Residence individuals are nearly two trophic levels above sheep/goat ($\Delta^{15}N$ 5.6‰) suggesting factors other than a trophic effect were involved. Illness, consumption of more salt-preserved protein, or consumption of higher trophic level marine resources have been suggested (Mbeki *et al*., 2017).

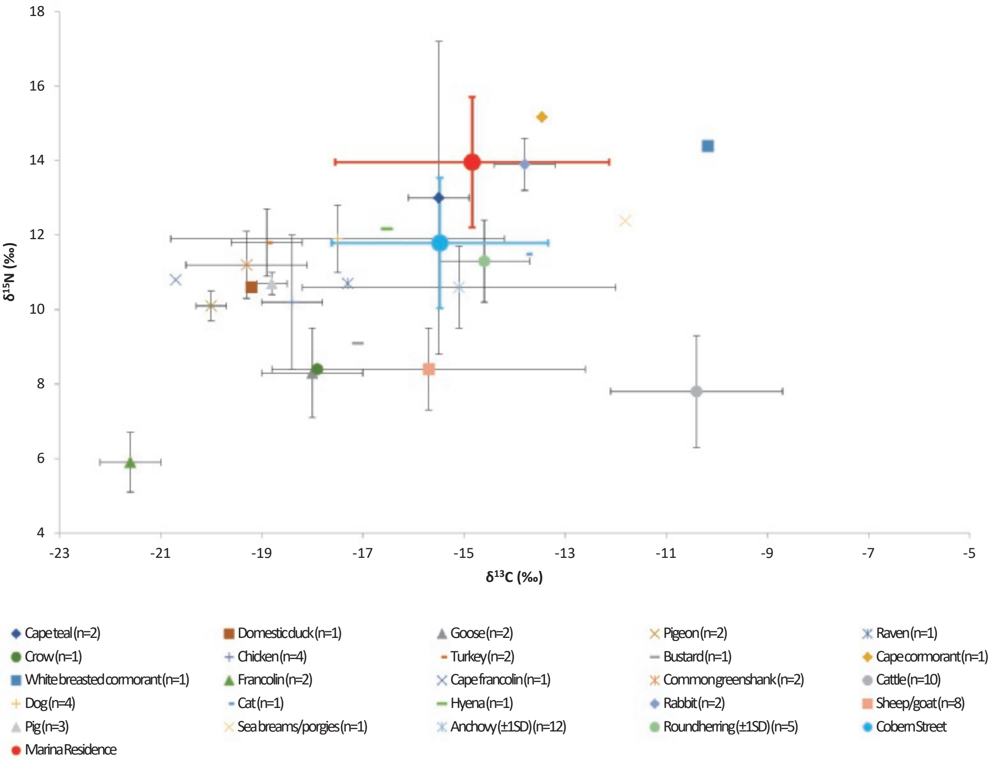

**Figure 17**: Average faunal isotopic values plotted with average isotope values from cancellous bone of individuals from the Marina Residence (n=27) and Cobern Street (n=50) sites.

Beef does not appear to have been a significant part of the diet of either the Cobern Street or Marina Residence individuals. The isotopic data is in contrast to the written sources in which Company slave diet is recorded. The Company journal entry of September 27th, 1674 states:

> The wagon arrives from Hottentoos Holland with a cask of salted beef and mutton, the carcases of cattle and sheep that had been killed in consequence of their leanness and decaying strength. It will be distributed here as food for the slaves (Leibbrandt, 1902:215).

Company-owned slaves' diet included beef, however the Cobern Street and Marina individuals, who may be representative of privately owned slaves, did not eat it in significant quantities. The daily lives of privately-owned slaves were poorly documented, if at all, but it is apparent from the isotopic data that there may have been a significant difference in the diet of Company slaves relative to that of privately-owned slaves.

Domestic and wild birds, and pork were not consumed by slaves in significant quantities, and their presence in the faunal assemblage is most probably as a result of their consumption at the governors table as suggested by Heinrich (2011).

## Conclusions

This study has shed some light on animal husbandry practices at The Cape and its hinterland and provided the first dietary baseline for application to the delineation of the underclass diet at the colonial Cape. The isotopic data from the fauna demonstrate that herds of cattle were probably grazed far inland in an arid $C_4$ biome. A few sheep/goat plotted in the same region suggesting they too were grazed far from the coast. Animals from the domestic sphere displayed elevated $\delta^{15}N$ values probably as a result of consumption of manured plants and/or a combination of a coastal influences.

The data have served mainly to exclude wild and domestic fowl, pork, and beef as significant protein contributors to slave diet. Fowl were rare, and cattle were in short supply and probably reserved for provisioning passing ships and would not be set aside for enslaved persons. Anchovy and mutton are possible contributors to underclass diet which is in agreement with archaeological studies (Markell *et al.*, 1995). There is still room to extend this baseline, particularly with snoek fish isotopic data. Further amino acid stable isotope analysis could clarify whether the isotopic differences between the Cobern Street and Marina Residence individuals are due to dietary or metabolic factors.