



Summer Meeting, 6–9 July 2015, *The future of animal products in the human diet: health and environmental concerns*

Food and nutrient intake in low-income families: the archaeology of nutrition

H.J. Hunt-Watts, J.E. Cade and D.M. Hadley

School of Food Science and Nutrition, University of Leeds, Leeds, LS2 9JT; Department of Archaeology, University of Sheffield, Sheffield, S1 4ET

With rising demands on food banks and an estimated 3 million people said to be malnourished in the UK, modern Britain is facing growing food poverty⁽²⁾. The causes behind this have been extensively debated, and it is apparent that it is a consequence of a number of complex factors. The wider project behind the results presented here will examine the historical gap between wealth and health, causes behind food poverty, and the social attitudes towards low-income communities, to reveal the underlying factors which both worsened and improved nutritional health in the 18th and 19th centuries. Here we present the results of an examination of the impact of social status on past nutritional health.

Five human skeletal collections from cemetery sites located in London and Birmingham have been included in the analysis thus far. These sites date to between 1712 and 1863, and the skeletal remains are from individuals of known socio-economic status. Multivariate logistic regression was performed on data from 1614 skeletons to test for the odds of low socio-economic individuals having skeletal indicators of poor nutritional health. Age and sex were adjusted for, and cluster analysis was performed to adjust for the location of different cemetery sites. Skeletons from high-status burials were the comparator and the results below show the risk of poor nutritional health in low-status individuals.

Skeletal indicators of nutritional health	Unadjusted			Adjusted for age and sex			Adjusted for age, sex, cemetery clustering.		
	OR	CI	P	OR	CI	P	OR	CI	P
DISH	0.25	0.14, 0.43	<0.01	0.32	0.18, 0.56	<0.01	0.32	0.12, 0.81	0.02
Rickets	0.75	0.51, 1.09	0.13	0.53	0.35, 0.81	<0.01	0.53	0.41, 0.69	<0.01
Cribriform orbitalia	1.80	1.30, 2.48	<0.01	1.20	0.85, 1.69	0.30	1.20	0.45, 3.19	0.72
Gout	0.43	0.17, 1.06	0.07	0.60	0.24, 1.51	0.28	0.60	0.33, 1.10	0.1
Osteomalacia	1.32	0.42, 4.17	0.63	1.61	0.50, 5.19	0.42	1.61	0.30, 8.66	0.58
Scurvy	3.36	1.42, 7.98	0.01	0.82	0.32, 2.09	0.68	0.82	0.37, 1.84	0.63

Diffuse idiopathic skeletal hyperostosis (DISH) is characterised by ankylosis of the anterior, right vertebral column and occurs predominantly in males over the age of 45⁽³⁾. Similar to gout, DISH is an indicator of excessive diet and related health conditions such as obesity, diabetes, and cardiovascular disease⁽³⁾. Rickets and osteomalacia occur during severe vitamin D deficiency⁽⁴⁾, cribriform orbitalia can indicate iron deficiency anaemia⁽⁴⁾, and scurvy results from vitamin C deficiency⁽⁴⁾.

These results suggest that those buried in low-status cemeteries were less likely to present with signs of poor nutritional health than those buried within high-status cemeteries. That DISH is more likely to occur in high-status individuals is unsurprising, considering that the wealthy probably had access to higher quality foods in larger quantities. However, vitamin D deficiency occurring within the high-status population is more striking, and is possibly the result of cultural behaviour which led to reduced sunlight exposure amongst children of the wealthy.

Further work will concentrate on a comparison of these results, coupled with historical research into 18th and 19th century diet, with modern nutritional health as established by the National Diet and Nutrition and Low Income Diet and Nutrition surveys.

1. White Rose College of the Arts and Humanities
2. Elia M., Smith R.M. (2009) *BAPEN*.
3. Rogers J., Waldron T. (2001) *Int J. Osteoarchaeol.* **11**, 357–365
4. Ortner D.J., Putschar W.G.J. (1981) *Smithsonian contributions to anthropology* **28**

