

Access to Food and the Biological Standard of Living: Perspectives on the Nutritional  
Status of Native Americans

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The high nutritional status of native American equestrian tribesmen in the middle of the nineteenth century is discussed in Steckel and Prince (2001). The aim of this note is to contextualize their important finding by placing it into a broader interpretive and empirical framework. The reported phenomenon is entirely in congruence with our knowledge of the physical stature of many other pre- and early-industrial groups living in comparable environments. Being tall was the standard on the North American frontier prior to the acceleration in population growth and the concomitant urbanization and industrialization of the late antebellum decades (Table 1). People who were self-sufficient in food production, living on productive land, and in regions with low population density (removed from urban markets and their disease pools) tended to be tall, even if they were poor in conventional terms (Komlos, 1998). Proximity to nutrients invariably conferred considerable biological advantages in the early-industrial period vis-à-vis urban populations prior to the emergence of refrigerated railroad cars<sup>1</sup> (Cuff, 1998; Craig and Weiss, 1998; Haines, 1998). The native American subsistence hunters were living in close proximity to an immense source of high-quality inexpensive protein: the bison herds of the plains.<sup>2</sup> Insofar as the plains tribesmen were able to harvest and thrive on this protein-rich natural resource, it is not surprising that they were well nourished (Prince, 1998, p. 57).<sup>3</sup>

By the second half of the 19th century America was no longer living in an epidemiological and socio-economic environment comparable to that of the frontier. Yet, all samples so far examined indicate, that at a time when a larger share of Americans were living in a frontier environment, they were taller than the native Americans (Table 1). Actually, Ohio farmers were taller even during the second half of the 19<sup>th</sup> century, as were students from South Carolina (Table 1, rows 3, 4 and 6).

That the proximity to the source of food conferred biological advantages is now well established: "the tallest men in the Habsburg monarchy were born in the

economically least developed lands.... Although technologically backward, the peasants were self-sufficient and lived on productive land that was not densely populated" (Komlos, 1985, p. 1156). The pattern has been found in a large number of populations: "The fact that Swedes from the northern provinces born before 1850 were substantially taller than their more southern... compatriots accords well with the status of the North as a frontier region, lightly populated and devoted to hunting and raising animals" (Sandberg and Steckel, 1987), and similarly for the United Kingdom: "The tall-but-poor anomaly also holds for other isolated pre-industrial populations"<sup>4</sup> (Nicholas and Steckel, 1997, p. 115). "Town dwellers, however, were generally at a disadvantage for procuring nutrients because they were farther from the source of food supply, and, unlike the rural population, were not paying farm-gate prices for agricultural products" (Komlos, 1998, p. 790).<sup>5</sup> In short, the nutritional status of native Americans was commensurate with their pre-industrial life style.

This implies that a more balanced view of the biological standard of living of the plains Indians is obtained by comparing their height to those attained by others at a time when they were living in a low-population-density protein-rich environment, and were self-sufficient in food production.<sup>6</sup> Such comparative framework indicates that the height of native Americans was, in fact, hardly remarkable, given their nutritional and epidemiological circumstances, and was nearer to African-Americans, who tended to be at the lower end of the socio-economic hierarchy<sup>7</sup> (Table 1). However, I hope that this does not diminish in any way our appreciation of the ability of the native Americans to live in harmony with their natural environment. My intention is merely to emphasize that their relatively high nutritional status fits rather neatly into a by now well-established pattern, according to which prior to the age of refrigeration "propinquity to the source of food provided some [considerable] nutritional advantages" (Komlos, 1989, p. 97).

Table 1. Mean Adult Male Heights of Pre- and Early- Industrial American Populations

Population	Height (cm)	Birth Cohorts
1) Georgia Rural	176.3	1820s
2) USA Farmers	175.3	1820s
3) USA Middle Class	175.0	Late 19 <sup>th</sup> century
4) Ohio Farmers	174.9	Late 19 <sup>th</sup> century
5) Pennsylvania Farmers	174.5	1820s
6) South Carolina	174.1	Late 19 <sup>th</sup> century
7) New York State Farmers	173.4	1820s
8) USA Average	173.0	1820s
9) <b>Native Americans</b> Average	<b>172.6</b>	Mid-19 <sup>th</sup> century
10) Georgia African-Americans	172.2	1840s
11) Maryland Slaves	172.1	1840s
12) Virginia African-Americans	172.0	1820s

Sources: rows 1) Komlos and Coclanis, 1997, p. 445; 2) A Hearn, 1998, 263; 3) Sunder, 2001; 4) Steckel and Haurin, 1995, 124; 5) Cuff, 1998, p. 226; 6) Coclanis and Komlos, 1997, p. 98; 7) Haines, 1998, p. 172; 8) Steckel, 1992, p. 288; 9) Steckel and Prince, 2001, p. 289; 10) Komlos and Coclanis, 1997, p. 445; 11) Margo and Steckel, 1992; 12) Bodenhorn, 1999, 983.

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<sup>1</sup> A similar pattern has been found among contemporary societies: in lowland Bolivia, for example, „measures of material wealth are not significantly associated with measures of childhood growth and nutritional status. In contrast, measures of degree of integration to the market economy are inversely related to children’s growth status, even after adjusting for differences in household wealth“ (Leonard, Foster, Godoy and Byron, 2001).

<sup>2</sup> Commonly known as the buffalo, an animal could yield as much as 500 pounds of meat. The herds were not depleted until the late 1880s; the bison was supplanted by other big game – elk, deer, antelope.

<sup>3</sup> A hunter could kill many bison a day, but a family needed only 24 of them in a year.

<sup>4</sup> “The situation of poor, isolated population being taller than a wealthy, more commercial population was not, then, unique to the Irish-English comparison” (Nicholas and Steckel, 1997, p. 115; See also Shay, 1994, Mokyr and O’Grada, 1994, Baten, 1996).

<sup>5</sup> “Individuals who bought their food had to pay for transportation costs and for the efforts of middlemen, whereas subsistence farmers did not” (Komlos, 1989, p. 97).

<sup>6</sup> Note, that the equestrian Plains Indians is a subset of all native Americans. They are distinguished by location – the plains – and by mode of production – nomadic hunting with horses. As a consequence, it makes sense to compare them to a subset of Americans, for example, those living in frontier areas as farmers. It is less informative to compare these nomadic tribesmen living in a sparsely populated area extending from Canada to Texas and numbering less than 100 thousand, to average Americans with a male population of 17 million in 1870, which included urban dwellers in Boston, New York City and Philadelphia.

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<sup>7</sup>Note that height of American farmers vary in Table 1 by about 3 cm on account of the various degrees of urbanization, population density, and soil productivity that are not controlled for in this univariate table. Note that the tribal heights varied by more: by as much as 9 cm (Steckel and Prince, 2001, p. 289). This is not the place to discuss these variations, even if they point to considerable variance in environmental circumstances. The interested reader might consult (Jantz, 1995).