

THE FEEDING OF SLAVE POPULATION IN THE  
UNITED STATES, THE CARIBBEAN, AND BRAZIL:  
SOME REMARKS IN THE STATE OF THE ART

LA ALIMENTACIÓN DE LA POBLACIÓN ESCLAVA  
EN ESTADOS UNIDOS, EL CARIBE Y BRASIL:  
COMENTARIOS SOBRE EL ESTADO DE LAS COSAS

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**Abstract.** This article examines the state of the art on the issue of slave feeding in the three largest slave societies of the Americas: The United States, the Caribbean and Brazil. Through a comparative analysis, the paper shows the evolution of the lines of research and methodological approaches on the topic, paying special attention to the problems that historians face at working with disparate sources in pursuit of reconstructing the captives' diet. Finally, we discuss the parameters to measure the appropriate level of nutrient intake based on the slaves' physical constitution.

**Key words:** slavery, slave feeding, slave trade, social conditions.

**Resumen.** El artículo examina el estado de la cuestión sobre el tema de la alimentación de los esclavos en las tres mayores sociedades esclavistas de las Américas: Estados Unidos, el Caribe y Brasil. Mediante un análisis comparativo, se presenta la evolución de las líneas de investigación y los enfoques metodológicos sobre el tema, poniendo especial atención a los problemas que los historiadores enfrentan al trabajar con fuentes dispares en pos de reconstruir la dieta de los cautivos. Finalmente, se discuten los parámetros para medir el nivel adecuado de ingesta de nutrientes en función de la constitución física de los esclavos.

**Palabras clave:** esclavitud, alimentación de esclavos, tráfico de esclavos, condiciones sociales.

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## INTRODUCTION

Food is not only a necessary constituent for life –since it provides energy and materials for the formation of living tissue– but also an important source of enjoyment,<sup>1</sup> and a remarkable indicator of economic, social and cultural differences among human communities. The importance of food in the construction of social differences was already perceived by the French gastronome Jean Anthelme Brillat-Savarin who in 1823 coined the famous mot “tell me what you eat, and I will tell you what you are”. Some years later, the German philosopher Ludwig Feuerbach condensed the idea in a more concise phrase “man is what he eats”. However, despite its undeniable transcendence, the parochial act of eating was away of the historians’ spotlight whose main focus was the political history. Only from the second half of twenty century, the emergence of economic and cultural history reoriented the interest of historians to specific aspects of human life as feeding, which gives us a chance of understanding the nature of slavery from a novelty approach.

The study of food consumption patterns of slave populations is one of the most challenging topics in the historiography about slavery in the New World. For a long time, it was taken for granted that captives were maltreated and poorly fed by their masters in almost every place of America. This belief was backed by abolitionist literature whose anti-slavery discourses emphasized the extremely poor living conditions of captives to justify the legal halt of slavery. On basis of this literary evidence, the historical community tended to accept as a fact the idea that slaves actually lived on the edge of malnutrition.

In 1974, the economic historians Robert W. Fogel and Stanley L. Engerman published a very controversial book entitled *Time on the Cross* that challenged most of the former scholarly about slavery, in special the widespread belief on the “malnutrition of captives”. Their argument was highly provocative: food consumption of North American slaves was greater than that of free men at the eve of Civil War. Even more, they hypothesize that “[slave] diet exceeded modern recommended daily levels of the chief nutrients”.<sup>2</sup> Not surprisingly, the book received a great deal of criticism from scholars and political advocates of African-American rights that accused both authors of doing an unethical defense of slavery system. Beyond the political implications of their study, the Fogel and Engerman’s book not only reopened a controversial issue on the American history, but also posed new methodological questions that greatly enriched the

<sup>1</sup> Sutch, “Care”, 1976.

<sup>2</sup> Fogel and Engerman, *Time*, 1974, p. 113.

academic debate and aid to promote new research projects that are shifting the common ideas about nutrition of slaves in The United States.

The issue of slave diet has also been object of study in other slavery societies of the Americas. In the case of Brazil, there is a vast historiography related to captives' food consumption mostly done for local researchers.<sup>3</sup> On the other hand, US historians made remarkable contributions to the knowledge of nutritional conditions of former English and French Caribbean slaves.<sup>4</sup> Much more modest has been the intellectual interest in exploring the situation of slaves in Spanish dominions, with exception of Cuba.<sup>5</sup>

The topic of slave nutrition attracted a great deal of interest from historians seduced by the Marxist ideas of exploitation and dominion relationships between the Sixties and Eighties. And although historical attention has receded significantly in recent years, there is still space for research to be done in this area. In this regard, the current article explores the state of the art about slave nutrition in three regions of the Americas: The United States, the Caribbean, and Brazil. More than a simplistic account of historical findings, this paper analyzes the methodological issues that historians face when dealing with problematic data about feeding patterns of slave population as well as the obstacles to tackle a comparative study of slave nutrition in a continental level. Other question discussed here is the parameters to measure what an adequate feeding is, since the specific demand of nutrients in human beings greatly vary in function to age, sex, and daily activity performed. Finally, the article examines the dietary regimen of expectant mothers and children to seek probable responses to the high rates of infant mortality among slave populations.

#### QUANTITY AND QUALITY OF SLAVE DIET IN THE UNITED STATES

At the beginning, the intellectual debate on slave nourishment was plagued of moral and political considerations about American slavery society. Not surprisingly, former researchers tackled the issue from a subjective point of view: hunger sensation. Such question divided the academia in two opposite sides aligned to divergent political agendas. Thus, for the opponents of slavery system it was clear that slaves lived in a permanent state of hun-

<sup>3</sup> Freyre, *Casa-grande*, 1933; Coutinho, "Alimentação" 1935; Stein, *Vassouras*, 1957; Karasch, "Slave", 1972; Piratininga, *Dietário*, 1991, and Lorimer, "Impacto", 2001.

<sup>4</sup> Craton, "Jamaican", 1971, and 1975, *Searching*, 1978; Craton, Walvin, and Wright, *Slavery*, 1976; Higman, "Growth", 1979; Eltis, "Nutritional", 1982; Friedman, "Heights", 1982, and Kiple, *Caribbean*, 1984.

<sup>5</sup> Moreno, *África*, 1977; Kiple, *Blacks*, 1976, and Bergad, *Cuban*, 1990.

ger due to the poor food allowance offered by their masters. In order to support their claims, they published several testimonies that described the slaveowners' immoral practice of depriving food for their captives. One of the most famous testimonies in this regard is that of the anti-slavery activist and former slave Frederick Douglass who relates his personal experience in dramatic terms:

Not to give a slave enough to eat, is regarded as the most aggravated development of meanness even among the slaveholders. The rule is, no matter how coarse the food, only let there be enough of it. This is the theory; and in the part of Maryland from which I came, it is the general practice –though there are many exceptions. Master Thomas gave us enough of neither coarse nor fine food. There were four slaves of us in the kitchen –my sister Eliza, my aunt Priscilla, Henny, and myself; and we were allowed less than a half of a bushel of corn-meal per week, and very little else, either in the shape of meat or vegetables. It was not enough for us to subsist upon. We were therefore reduced to the wretched necessity of living at the expense of our neighbours. This we did by begging and stealing, whichever came handy in the time of need, the one being considered as legitimate as the other. A great many times have we, poor creatures, been nearly perishing with hunger, when food, in abundance lay mouldering in the safe and smoke-house, and our pious mistress was aware of the fact; and yet that mistress and her husband would kneel every morning, and pray that God would bless them in basket and store!<sup>6</sup>

A similar autobiographical story was recounted by the ex-slave Charles Ball who refers the customary foodways of captives in Maryland:

As I was always very obedient, and ready to execute all his orders [from his master], I did not receive much whipping, but suffered greatly for want of sufficient and proper food. My master allowed his slaves a peck of corn, each, per week, throughout the year; and this we had to grind into meal in a hand-mill for ourselves. We had a tolerable supply of meat for a short time, about the month of December, when he [the master] killed his hogs. After that season we had meat once a week, unless bacon became scarce, which very often happened, in which case we had no meat at all.<sup>7</sup>

In Antebellum America, these stories were widely publicized by abolitionist activists to prove how slave-owners neglected the feeding of their slaves. On the other side, the advocates of slavery system alleged that most slaveholders were benevolent masters concerned about their slaves' wel-

<sup>6</sup> Douglass, *Narrative*, 1851, pp. 50-51.

<sup>7</sup> Ball, *Fifty*, 1859, pp. 16-17.

fare. The most representative author of this conservative point of view was Ulrich Bonnell Phillips, who pursued to demonstrate that slavery was a progressive social institution well suited to the Southern character.<sup>8</sup> As evident, the former debate around slave feeding was tackled from the subjective angle of hunger sensation on basis of literary testimonies fueled by partisan politics.

By mid-twenty century, the controversy acquired a more scientific tone when historians began to analyze the slave diet from a quantitative approach. New pieces of evidence would demonstrate that most captives did not experience crude hunger sensation, but severe pictures of specific dietary deficiencies. In other words, slaves probably were supplied with a sufficient food allowance to satisfy their appetite, but such ration was far of being balanced in nutritional terms. Thus, the question of slave nourishment was not an issue of quantity but a problem of quality and variety.

According to different sources, the typical diet of a male working slave consisted on 3½ pounds of salt pork and one peck of corn meal per week,<sup>9</sup> supplemented with some vegetables and fruits.<sup>10</sup> This daily ration was largely deemed as misbalanced for both contemporary witnesses and modern scholars due to that it barely met the nutritional requirements of captives.<sup>11</sup> The probable consequence of such feeding regime based on a monotonous diet was the remarkable augment of cases of metabolic disorders related to bad nourishment. In words of Eugene Genovese, the existence of “specific hungers, dangerous deficiencies, and [an] [...] unidentified form of malnutrition” [might have] led to a significant number of slaves to be “either physically impaired or chronically ill”.<sup>12</sup>

<sup>8</sup> Despite its benevolent nature, Phillips deemed that slavery was a moribund economic institution, responsible for the slow growth rate of Southern US. Phillips, *Life*, 1929.

<sup>9</sup> Sutch, “Care”, 1976, p. 235.

<sup>10</sup> Phillips, *Life*, 1929, p. 197; Sydnor, *Slavery*, 1933, p. 31; Taylor, *Negro*, 1926, p. 90, and Stamp, *Peculiar*, 1956, pp. 283-285.

<sup>11</sup> In his autobiography, Frederick Douglass remembers that “the men and the women slaves on Col. Lloyd’s farm received as their monthly allowances of food, eight pounds of pickled pork, or its equivalent in fish. The pork was often tainted, and the fish were of the poorest quality. With their pork or fish, they had given them one bushel of Indian meal, unbolted, of which quite fifteen per cent was more fit for pigs than for men. With this, one pint of salt was given, and this was the entire monthly allowance of a full-grown slave, working constantly in the open field from morning till night every day in the month except Sunday.” Douglass, *Life*, 1882, p. 29. Kenneth Kiple quotes the testimony of an ex-slave who complained about their feeding because they “weren’t allowed to eat all the different kinds of victuals the white folks ate”. Another slave was more explicit to say that “Marsters would buy a years ration on de first of every year and when he git it, he would have some cooked and would set down and eat a meal of it. He would tell us it didn’t hurt him, so it won’t hurt us. Dats de kind of food us slaves had to eat all de year [sic].” Kiple, *Another*, 1981, p. 80.

<sup>12</sup> Cited in Kiple, *Another*, 1981, p. 81.

If a deficient diet potentially increases the number of sick people and labor absenteeism, then, why planters did not supply a more balanced food ration to their slaves? The answer likely lies on economic motifs. Since the costs of slave living expenses represented the most important share of plantation budget, planters had a strong incentive, in the short run, to cut expenses in feeding by means of standardization of slave diet which entailed to choose a very restricted range of staple foods. The choice for pork and corn was dictated by practical reasons: they were cheap commodities and easy to store for long time. Kenneth Stamppe rejected this economic explanation and rather suggests that masters did not provide an adequate diet to their slaves because of ignorance before avarice, since they probably were not aware of the advances in dietetic science.<sup>13</sup> Richard Sutch agreed with Stamppe in this point, adding that masters were not interested on spending extra money to provide luxury food to their workers because they misjudged the potential of a balanced diet in increasing labor productivity.

The Robert W. Fogel and Stanley L. Engerman's *Time on the Cross* broke this scholarly consensus on the issue of nutritional deficiencies in slave feeding, criticizing the idea of a "monotonous diet" as a historical invention based on a wrong reading of the instructions of the masters to their overseers.<sup>14</sup> Instead they claim that the mention of "pork and corn" in the dietary instructions was not literal, but a standardized language to refer foodstuff in general. In order to prove their point, they conducted an exhaustive research to find out what staple foods comprised the typical slave diet. Their conclusion is that the regular allowance for captives was diversified since it included products such as "beef, mutton, chickens, milk, turnips, peas, squashes, sweet potatoes, apples, plums, oranges, pumpkins, peaches, salt, sugar, molasses, fish, coffee, and whiskey".<sup>15</sup>

The Fogel and Engerman's argument, though provocative, relies on indirect evidence based on the Parker-Gallman sample (extracted from the Agricultural Census of 1860) and processed with a statistical method known as "residual". The premise is that most of the foodstuffs produced in the plantations were consumed by people and animals living in the estates. The procedure is straightforward: from the overall food production is subtracted the share consumed by whites (10%), the grain for animals, and the meat sold off farms (30% of beef and 15% of pork). Since the rest of food was not marketable outside plantations, it is arguable that the "residual product" was devoted to slave feeding.

<sup>13</sup> Cited in Sutch, "Care", 1976, p. 281.

<sup>14</sup> Fogel and Engerman, *Time*, 1974, p. 109.

<sup>15</sup> *Ibid.*, p. 111.

The method and findings of Fogel and Engerman (henceforth F&E) attracted a great deal of criticism because they were based upon premises not supported by empirical data. The first criticism came from the economist Richard Sutch, who questioned two important pieces of evidence: the sample size and the figures of nutritional content of slave diet. Sutch's criticism can be summarized in three major points: 1) F&E used a substantially reduced share of the Parker-Gallman sample (from the Agricultural Census of 1860) to prove their hypothesis. Indeed, the original sample collected by William Parker and Robert Gallman comprises 5 229 farms from Southern US, but F&E barely extracts data from 77 farms that represents less than 10% of population surveyed in the original Parker-Gallman sample. 2) F&E miscalculated the number of whites living in farms and underestimated their food consumption. Sutch argues that the figure of white population only includes the residents of planters' houses, while the rest of whites living in separated residences (such as overseers) did not enter in the statistic. 3) F&E miscalculated the conversion ratio between crop and food output, and between livestock and meat production. Thus, while F&E estimate that slaves received 67% of their daily intake of calories from pork and corn, Sutch asserts that this proportion reaches 82.9%. Finally, Richard Sutch recalculated the figures of *Time on the Cross*, concluding that the slave diet was monotonous and deficient in many basic nutrients since more than  $\frac{2}{3}$  of daily allowance consisted on corn and pork (see table 1).

In 1992, Robert Fogel wrote a reply which further amplifies some points of his book. 1) He found that his former calculation on slave diet gives virtually identical energy values than that provided by Richard Sutch (4 125 calories in *Time on the Cross* versus 4 206 calories in "The Care and Feeding of Slaves"). 2) Even though the daily allowance seems narrow and monotonous, as Richard Sutch claims, it actually met the nutritional demands on basic nutrients (with exception of riboflavin). 3) The method of calculating an average daily intake of a given food checklist offers a false impression of dietetic misbalance; when, in fact, slave diet greatly varied throughout the year which probably aided to correct any nutritional deficiency. Likewise, Fogel found that slaves did not fully rely on the weekly ration provided by their masters, since they could obtain food by other means.<sup>16</sup> He cited an article of Stephen C. Crawford, who suggests that slaves supplemented their formal daily ration by means of opportunistic strategies such as cultivate garden plots, hunt, fish, beg, or steal food.<sup>17</sup> Further research made in former slave households by archeologists and medical anthropologists have confirmed the existence of some of those

<sup>16</sup> Fogel and Engerman, "Slave", 1992, pp. 291-304.

<sup>17</sup> Crawford, "Problems, 1992, pp. 331-393.

TABLE 1. FOOD CONSUMPTION OF AMERICAN SLAVES

<i>Food</i>	<i>Fogel and Engerman</i>		<i>Sutch</i>	
	<i>Pounds per year</i>	<i>Calories per day</i>	<i>Percent of energy derived</i>	<i>Percent of energy derived</i>
Pork	88	543	13	16.3
Corn	507	2 265	54.1	66.6
<i>Subtotal</i>	595	2 808	67.1	82.9
Beef	43	108	2.6	2.3
Mutton	2	5	0.1	0
Milk	171	144	4.2	2.1
Butter	3	30	—	—
Sweet potatoes	318	424	10.1	5.6
Irish potatoes	22	19	0.5	0.3
Cowpeas	101	427	10.2	3.5
Wheat	34	156	3.7	3.3
Miscellaneous grains	14	64	1.5	0
<i>Total</i>	1 303	4 185	100	100
			<i>Pounds per year</i>	<i>Calories per day</i>
			150	685
			636	2 803
			786	3 488
			29	96
			0	0
			105	88
			3	—
			204	233
			18	14
			35	149
			34	138
			0	0
			1 214	4 206

Sources: Sutch, "Care", 1976, p. 262, and Fogel and Engerman, *Time*, 1974.

practices aimed to improve the customary diet of captives. Table 2 shows the nutritional content of the diet revised by Richard Sutch.

Despite its undeniable attractiveness, data on slave diet only provides quantitative information about daily food intake, but it does not render specific evidence about physical conditions of captives. Therefore, scholars have sought more accurate indexes to measure these parameters such as height and body mass index. Robert A. Margo and Richard H. Steckel worked with the data of coastwise manifests which offer rich information on age, sex and height of slaves in America Antebellum. By means of an exhaustive analysis of slave physical development, they came to a surprising finding: “slaves reached adult height at earlier ages and were taller as adults than members of many nineteenth-century European populations”.<sup>18</sup> Other remarkable finding is that the average age at menarche among slave women was earlier than in their white Westerners counterparts at the first half of the 19<sup>th</sup> century.<sup>19</sup> On basis of those pieces of evidence, Margo & Steckel suggest that slaves probably were better fed than many white populations. However, height index still is not a fully reliable proof of good feeding, since results may be biased by several factors such as physical activity, region of origin, migrant status, birth cohort, and genetics.

The Margo & Steckel’s work paved the path to new research, raising a challenging question: did the slaves become taller or shorter in the long-term? In order to answer this question, John Kolmos conducted a survey to compare the heights of American and European populations on the first half of nineteenth century. Surprisingly, he found that while free people became shorter, the chattel slaves became higher at the same time. For Kolmos, this paradox –known in Europe as the “early-industrial-growth puzzle” and in America as the “Antebellum puzzle”– has an economic explanation. The early industrialization led to a massive rural migration to the new industrial urban areas. Rapid population growth and explosive urbanization increased the demand for food that traditional agriculture could not meet due to that it lagged behind in matter of technology and productivity. As food prices steadily rose, most urban worker families had to reduce or even to halt the consumption of certain products such as meat and milk, which are significant sources of calcium and proteins for children during their formative, developing years. Consequently, the average stature of free population tended to drop in the long-run. Conversely, planters were willing to offer a greater food allowance to their slaves in order to increase their productivity as agricultural workers in times of good prices for

<sup>18</sup> Margo and Steckel, “Heights”, 1982, pp. 516-538.

<sup>19</sup> Early menarche is very common among well fed healthy teenagers.

TABLE 2. NUTRITIONAL CONTENT OF THE SLAVE DIET

<i>Nutrient</i>	<i>Average daily recommended allowances (RDA)</i>	<i>Nutrients in Sutch's revised diet</i>	<i>Percentage by which nutrients in Sutch's exceed (+) or fall below (-) the standard (percent)</i>
Protein	56 gr	150.39	168
Calcium	400-500 mg	591.07	31
Iron	10 mg	35.7	257
Vitamin A	5 000 IU	28 607.4	472
Thiamine	2.11 mg	6.05	187
Riboflavin	2.54 mg	2.09	18
Niacin	27.90 mg	32.65	17
Vitamin C	45 mg	61.79	37

Sources: Sutch, "Care", 1976, and Fogel and Engerman, "Slave", 1992, p. 295.

agrarian commodities. It may explain the steady increase of slave stature during the first half of nineteenth century.<sup>20</sup>

Other studies demonstrated that malnutrition did not impair all slaves equally, but primarily expectant mothers and children.<sup>21</sup> Already some contemporary witnesses were aware of this dramatic situation such as the southern planter Thomas Afflick who asserts that “of those [slaves] born, one half die under one year”.<sup>22</sup> Richard H. Steckel found that the infant mortality rate among slave population in North America reached an astonishing figure of 350 children per thousand at the first year of life, which even may be greater if stillbirths are counted. Steckel speculates that the high ratio of mortality among newborn and infant slaves was basically caused by overworking of pregnant slave women, since excessive physical work put a woman at high risk of having a dangerous pregnancy and lactation period. A specific consequence was the remarkable increase in the number of cases of a mortal disorder known as Sudden Infant Death Syndrome.<sup>23</sup> Even if a slave woman gave birth to a healthy child, the chances of this baby to survive during first years of live were low due to deficient feeding. For Steckel, the precarious living conditions of expectant women and children have an economic explication: masters wanted to maximize the slave labor by which they were not willing to offer time off for female pregnant slaves or mothers taking care of their babies. This crude “cost-benefit” analysis led to the planters to neglect the specific care for mothers and children, since they were not productive investments in the short-run.

Philip R. P. Coelho and Robert A. McGuire questioned the Steckel’s argument because of its excessive reliance on economic rationality of planters. For Coelho & McGuire, the most plausible explanation of increasing infant mortality rate is rather the spread of debilitating diseases (e. g. malaria and hookworm) that impaired pregnant slave women. The adult people exposed to such diseases generally did not die, but suffered typical debilitating illnesses such as anorexia, anemia and chronic malnutrition. In the case of expectant mothers, the consequences were devastating not only for their own health but also for the fetus. Although Coelho & McGuire do not offer precise statistics about malaria and hookworm, the fact that both diseases were prevalent in semitropical regions of Southern US led them to think that a significant share of fertile slave women were not in good health conditions to give birth and rear healthy children.

<sup>20</sup> Komlos, “Shrinking”, 1998, pp. 779-802.

<sup>21</sup> Fogel, *Slavery*, 2003, p. 35.

<sup>22</sup> Cited in Steckel, “Dreadful”, 1986, pp. 427-428.

<sup>23</sup> Boles, *Black*, 1984, p. 100.

It is paradoxical that despite the tremendous obstacles to reproduction of captives in Southern plantations, the overall slave population grew to such a fast pace to the point of tripling its number between 1807 and Antebellum. In order to explain this puzzle, some authors have put forward the controversial idea that the Upper South (which comprised the states of North Carolina, Tennessee, Virginia, Kentucky, and West Virginia) deliberately concentrated in slave breeding to get “marketable human merchandise” to sell in the states of Lower South where the slave labor demand was quite high.<sup>24</sup> The Conrad and Meyer’s article is based on two lines of argument: the high fertility ratios and the high price of female slaves in those states devoted to slave breeding. Sutch added that some slaveholders preferred to export male slave and retain women in fertile age. The fact that some plantations remained with a majority of fertile teenagers and children would indicate that they were stud farms for slave breeding. Michael Tadman objected this thesis due to two serious inconsistencies: first, the Sutch’s sample size is too narrow to be used as solid evidence since it hardly included a list of 47 “possible stud farms” from a universe of 2 600 slaveholdings that comprised the original Parker-Gallman database. It is possible that the disproportionate number of women in relation to men in a few cases were explained by the importation of women for domestic service or the residence of slave husbands in neighborhood plantations. Second, the male bias in the exporting reports may express the intense traffic of young slave men for the cane plantations in Louisiana where unitary prices for male slaves were remarkably high, rather than the slave-owners’ desire of retaining women for reproduction.<sup>25</sup> In any case, the rapid increase of slave population implies a dramatic drop of infant mortality rates whose explanation still remained unsolved. Was it resulting of better care by slaveholders, or sanitary and cultural improvements in the care of expectant mothers and newborns? It is expected that further research will answer this striking issue.

#### THE NUTRITION OF CARIBBEAN SLAVE POPULATION

Despite sharing the same status of forced workers, Caribbean slaves showed remarkable disparities regarding to their US counterparts in matter of nutrition. A first divergence is related to the place of origin, by mid nineteenth century, almost the total of captives in The United States born there; while a significant part of Caribbean slaves were Western African

<sup>24</sup> Conrad and Meyer, “Economics”, 1958, and Sutch, “Treatment”, 1975.

<sup>25</sup> Tadman, *Speculators*, 1989, pp. 121-125.

newcomers (in a large part of the Spanish dominions).<sup>26</sup> Therefore, any study about nutritional background of African born slaves in the Caribbean should date back to their former feeding regime in their motherland. The scattered evidence in such matter suggests that Western Africans largely relied on poor vegetarian diet consisted on taro, yam, millet, rice, bananas, cassava and corn. It seems likewise that consumption of food from animal origin such as meat and milk was rare due to the biological obstacles to raising cattle<sup>27</sup> and the intolerance to lactose in many African populations. As a result of this poor dietary regime, Western African populations lived permanently under threat of famine. Their situation got worse during Atlantic passage because of awful sanitary conditions and the extremely poor daily ration consisted on boiled rice and salted fish. Not surprisingly, most African slaves showed clear signs of chronic malnutrition upon their arrival to Caribbean islands.

Once in the Caribbean, African born captives came to occupy the lowest strata in the colonial social ladder, which was mirrored in the nutritional differences with regard to their creole counterparts. Using an index of stature, B. W. Higman found a remarkable trend in slave populations: most colored Caribbean slaves were taller than those from African origin. The data from Cuba and Trinidad backed this hypothesis, but the equation is slightly different in the case of Guyana.<sup>28</sup> The fact that creole blacks were children or grandchildren of Africans would indicate that the height trend was quickly established. David Eltis notes that this gap in the stature of black populations to both sides of Atlantic is observable even today.<sup>29</sup> The most plausible explanation to this divergence in matter of height is the extreme food insecurity in Africa. Conversely to the situation of American captives, the African population sometimes experienced periods of severe food shortage that eventually led to episodes of starvation. On the other hand, the average intake of key amino acids and vitamins was substantially lower in Africa than in any American territory which also contributes to explain the increased height trend in creole slave populations.<sup>30</sup> Table 3

<sup>26</sup> The number of African born slaves steadily dropped in British dominions since the Eighteenth Century. Already by the beginning of 19<sup>th</sup> century, less of the 10 per cent of Barbadian captives were natural of Africa. Handler and Corruccini, "Plantation", 1983, p. 88. On the contrary, the majority of slave populations in Spanish colonies of Cuba and Puerto Rico were African born by mid 19<sup>th</sup> century. Barcia, *Seeds*, 2008, pp. 13-14.

<sup>27</sup> Nagana primarily attacked bovine cattle, horses and pigs, debilitating their victims and reducing its production of meat and milk. Therefore, nagana made unprofitable cattle's raising in certain regions of Western Africa where such disease was endemic.

<sup>28</sup> Higman, "Growth", 1979, pp. 373-385.

<sup>29</sup> Eltis, "Nutritional", 1982, pp. 466-467.

<sup>30</sup> *Ibid.*, p. 470.

shows mean height of creole and Africans in three different countries of the Caribbean region and The United States.

Despite the tropical isolated nature of Caribbean islands was not very appropriate for the production of food, Caribbean slaves were offered with a similar daily ration than their US counterparts. The economic historian Kenneth Kiple reconstructed the Caribbean slave diet on base of several sources (e. g.: instructions to overseers, travel accounts, slave care's treatises, and so forth), coming to the conclusion that its composition was quite similar to that of US Southern slaves. The typical daily ration comprised a portion of animal protein (beef or fish), a portion of cereal (corn or rice), and tropical vegetable supplements (taro, yam, bananas, and plantains). This feeding pattern is clearly noticeable in British colonies where, in words of the English medical doctor Pinckard (1796), "the food of the Negroes is very simple and but little varied; breakfast, dinner, and supper being similar throughout the year. It consists mostly of Guinea corn, with a small bit of salt meat or salt fish."<sup>31</sup> Sometimes the captives were granted with stimulants such as tobacco, molasses, and rum to award their hard-working and labor discipline. The table 4 shows the nutritional estimation of a typical daily slave diet in the Caribbean region.

Did this standardized diet meet the nutritional demands of Caribbean slaves? Based on the mean nutritional requirements for an adult male worker, Kipple analyzed the specific dietary values of a typical daily slave ration, coming to the following results: *a*) the basic food allowance included all key macronutrients; *b*) there was a moderate deficit in essential elements such as calcium, vitamin A, and vitamin B2 (Riboflavin), and *c*) it was detected a very low intake of fat which impairs the absorption of two key fat-soluble vitamins (vitamin A and B1). The lack of vitamin A was responsible for the high rate of night blindness among some Caribbean slave populations, and for the inability to digest certain proteins of animal origin. On the other hand, the chronic shortage of vitamin B1 led to an increasing number of cases of a debilitating disease known as beriberi.<sup>32</sup> Kipple suggests that the reliance on a feeding based on rice could have been linked to the notable prevalence of beriberi in certain regions of the Caribbean.<sup>33</sup>

Jerome S. Handler and Robert S. Corruccini also found physical traces of feeding disorders related to specific nutritional deficiencies in the slave population of Barbados. By means of a careful examination of dental structure of a sample of deceased Barbadian slaves, they determine the exis-

<sup>31</sup> Cited on Handler and Corruccini, "Plantation", 1983, p. 76.

<sup>32</sup> Kiple, *Caribbean*, 1984, pp. 89-103.

<sup>33</sup> Kiple, "Nutritional", 1989, p. 679.

TABLE 3. HEIGHTS (IN CENTIMETERS) OF AFRICAN  
AND CREOLE ADULT SLAVES (AGED 25-40 YEARS)

	No.	Males			Female			
		Mean	S. D.	Median	No.	Mean	S. D.	Median
<i>Trinidad, 1813</i>								
African	4 911	163.3	8.1	162.6	3 331	153.9	8.1	154.9
Creoles	128	165.6	7.6	167.6	149	154.9	8.4	157.5
<i>Guyana, 1819</i>								
African	397	164.3	7	162.6	355	154.6	6.7	153.2
Creoles	224	162.7	8.6	162.6	189	154.1	7.8	153.2
<i>Cuba, 1855-1859</i>								
African	640	158.4	10.5	n. a.	434	150.4	8.8	n. a.
Creoles	280	161.5	8.1	n. a.	281	154.2	7.6	n. a.
<i>The United States, 1828-1860</i>								
Total	518	171.6	n. a.	n. a.	n. a.	158.6	n. a.	n. a.

n. a.: not available.

Source: Higman, "Growth", 1979, p. 376.

TABLE 4. ANALYSIS OF CARIBBEAN SLAVE DIETS COMPUTED ON A DAILY BASIS

<i>Diet 1</i>	<i>Calories</i>	<i>Protein</i>	<i>Fat</i>	<i>Calcium</i>	<i>Phosphorus</i>	<i>Iron</i>	<i>Vitamin A</i>	<i>Thiamine</i>	<i>Riboflavin</i>	<i>Niacin</i>	<i>Vitamin C</i>
0.42 lb beef	387	65	12	38	791	9.7	0	0.13	0.6	7.2	0
1 pint cornmeal	884	22	8	42	544	4.4	1 180	0.74	0.2	4.6	0
Vegetable supplements	1 359	17	0	294	606	12	3 360	0.93	0.6	8.7	142
<i>Total</i>	2 630	104	20	374	1 941	26.1	4 540	1.8	1.4	20.5	142
Percentage RDA <sup>a</sup>	88	189	-	47	243	-	91	123	81	108	316
<i>Diet 2</i>											
0.42 lb fish	440	67	1	311	790	2.5	0	0.15	0.8	5.2	0
1 pint rice	1 416	26	2	94	366	3.2	0	0.28	0.12	6.2	0
Vegetable supplements <sup>b</sup>	1 359	17	0	68	607	12	3 360	0.92	0.57	8.7	142
<i>Total</i>	3 215	110	3	473	1 763	17.7	3 360	1.35	1.49	20.1	142
Percentage RDA	107	200	-	87	220	-	67	93	88	106	316

<sup>a</sup> Recommended Dietary Allowances. Kenneth Kiple made use of the RDA of 1974 for adult males between 18-35 years.

<sup>b</sup> 1/2 lb yams, 1/2 lb taro, 1 lb bananas, and 1 lb plantains.

Source: Kiple and Kiple, "Deficiency", 1980, p. 201.

tence of a high rate of growth-stoppage pathologies whose origin might have been linked to an erratic pattern of feeding. Indeed the discovery of a widespread number of teeth abnormalities such as hypercementosis, hypoplasia, and bilateral dental asymmetry<sup>34</sup> led them to hypothesize that slaves might have alternated periods of plenty feeding with other ones dominated by hunger. Handler and Corruccini presume that the approximated age of metabolic crisis due to deficient feeding occurred between the ages of three and four, which is roughly a year after infant weaning when children had to eat the same food provided to their parents.

Despite slaveholders tended to impose a rigid labor discipline in Caribbean cane plantations, they facilitated time off for captives to get supplementary food sources. Thus, most planters routinely granted their slaves small plots to raise poultry, small livestock or crops as a means to cut living expenses. The captives exchanged or sold a part of that they produced in their plots, or stole from plantations within the informal markets of the islands. Although those practices were only observable in Martinique and Barbados, they could have been widespread on all Caribbean regions where food represented the major share of plantations' budget.<sup>35</sup> The slaves also resorted to other ways to improve their diet such as collecting marine plants and animal, or eating earthy (geophagy), habit directly related to specific nutritional deficiencies.

Although many captives lived on the edge of malnutrition, this condition primary impaired Caribbean infants due to their fragile physical constitution. In his study about biological features of Caribbean slave populations, Kenneth Kiple provides an array of evidence in relation to infant diseases linked to deficient dietary regime. He refers the case of a rare illness known as "jawfall", "trismus", or "locked jaw" in British Islands; "mocezuelo" in Puerto Rico; and "tetanus neonatorum" in Cuba that caused the major number of deceases among newborn and whose primary symptom was an intense involuntary muscular movement for which it was typically diagnosed as tetanus. Kiple disputes this medical verdict on basis of the particular etiology of such disorder and the nutritional background of former women slaves during pregnancy and lactation. He rather suggests that uncontrollable muscular activity is a classical symptom of extreme shortage of calcium in feeding which could not be supplied for maternal milk due to that enslave mothers also suffered this nutritional deficient.<sup>36</sup> The beriberi was another disease prevalent among Caribbean infant slaves whose diagnosis was a bit problematic for contemporary phy-

<sup>34</sup> Handler and Corruccini, "Plantation", 1983, pp. 65-90.

<sup>35</sup> Walton, "Plantation", 1991, p. 396.

<sup>36</sup> Kiple, *Caribbean*, 1984, pp. 120-124.

sicians since the symptoms are different of those experienced by adults. Thus, if a slave baby survived to the “jawfall” disease, he still could get sick of three different forms of beriberi before his first year of life. The first type of beriberi was a cardiac form characterized by vomiting, loss of appetite, convulsions, and cardiac failure, that normally attacked infants between the first and fourth month of life. The second “aphonic” form, observable between the fifth and seventh month of life, was customarily associated to respiratory disorders since the major symptom was the aphonia. Finally, the third “pseudomeningeal” form, which occurred from the eight to tenth month of age, concentrated its attack on the central nervous system for which its clinical picture was confused with those of tuberculous meningitis or encephalitis.<sup>37</sup> Slave children also suffered a specific alimentary syndrome characterized by loss of weight, “weanling diarrhea”, and behavioral disorders. Modern physicians diagnose this bizarre illness as Protein Energy malnutrition, a technical expression to refer a very severe form of malnutrition that primary impairs people in both extremes of cycle of life (infants and elderly).<sup>38</sup> The probable cause of this disorder was the inadequate feeding provided to infants. In the early 1800s, the plantation doctor Henry Holder pointed out that infants under a year were routinely fed with “cold pottages prepared from the most flatulent and indigestible vegetables or eating roots which they cannot digest”.<sup>39</sup> As a consequence, their stomachs became swelled and began an incessant diarrhea that debilitated their fragile bodies.

The inadequate feeding provided to pregnant women enslaved and infants during first years of life caused a high rate of infant mortality that made untenable the natural reproduction of Caribbean slave population. In this scenario, the slaveholders just had two choices: import more captives or promote slave breeding. The fate of black populations in the Caribbean largely depended on such crucial decision.

#### THE SLAVE DIET IN BRAZIL

Brazil is almost a continent-country with greater diversity in matter of feeding due to that each region has its own culinary tradition. Therefore there was not a typical diet, but regional differences both in terms of quantity and variety. In 1887, the Bahian physician Hernani da Silva Pereira wrote an interesting treatise entitled “The Most Common Foods in Our Prov-

<sup>37</sup> *Ibid.*, p. 126.

<sup>38</sup> Handler, “Diseases”, 2009, pp. 34-35.

<sup>39</sup> *Ibid.*, p. 34.

inces” where describes the customary feeding in different regions of the country. In the case of Rio de Janeiro and Sao Paulo, the rich and middle class people primarily consumed fresh meat and beans while the poor had to content themselves with a modest ration of dried meat and cornmeal (or manioc flour). This disparity was less significant in Minas Gerais and Rio Grande do Sul where there was a plentiful supply of food available for all social groups. Thus, the standard diet of a *mineiro* comprised pork, cornmeal, and beans, while the daily allotment of a *riograndense* included fresh meat, a portion of cereal, and vegetables. Comparatively, the feeding of a *nordestino* (people of the Northeast region) was poorer since it consisted on a meager ration of dried meat and manioc flour.<sup>40</sup>

In the case of the slaves, there are serious discrepancies among historians because of the ideological burden of slavery in the Brazilian history. The traditional historiography, led by the eponym figure of Gilberto Freyre, traced a sympathetic portrait of slavery based on an idealized view of the relationships between masters and slaves, claiming that –in broad terms– slaves were well fed by their masters. However, this idealistic view was rejected by contemporary testimonies such as this of Luis dos Santos Villena who crudely referred “o barbaro e cruel e inaudito modo como a maior parte dos senhores tratam os seus desgraçados escravos de trabalho. Tais ha que nao lhes dando sustento algum lhes facultam somente trabalharem no domingo ou dia santo em um pedacinho de terra a que chama ‘roça’ para daquele trabalho tirarem sustento para toda a semana, acudindo somente como alguma gota de mel, o mais grosseiro, se e tempo de moagem.”<sup>41</sup> A similar opinion was expressed by the English traveler Henry Koster, who stated that “the food provided to slaves is not sufficient in quantity, and the nutritional content of the food is not proportional to the work required”.<sup>42</sup> Although interesting, both testimonies are subjective viewpoints with no quantitative basis to support a scientific study of slave diet.

Unlike The United States and Caribbean planters, the Brazilian slaveholders did not keep a detailed record of the amount of specific foods provided to their captives. This lack of quantitative data is the major obstacle to estimate the nutritional value of daily slave diet in order to make a comparative study on a national or continental scale. Historical sources barely offer such a list of relevant food that comprised the customary slave ration in different regions of the country. Thus, in the case of the Reconcavo (Bahia), the daily standard allotment in mid-eighteenth century was a ration

<sup>40</sup> Kiple, “Nutritional”, 1989, p. 80.

<sup>41</sup> Moura, *Dicionario*, 2004, p. 25.

<sup>42</sup> *Ibid.*

of manioc flour (*farinha de mandioca*), and salt-cured meat or fish.<sup>43</sup> This diet was supplemented with bananas, rice,<sup>44</sup> whale fish,<sup>45</sup> rum and sugar byproducts during the sugarcane harvest.<sup>46</sup> In 1834, the French physician Jean Baptiste Alban Imbert published a *Manual do Fazendeiro* where describes the customary slave ration in sugar plantations of Rio de Janeiro: a piece of bread and a cup of rum (*cachaça*) very early in the morning before working day. At mid-morning slaves stopped working to have a breakfast that comprised a portion of boiled rice, bacon, and coffee. Dinner was served in the field at midday and consisted of dried meat and vegetables. At night, slaves were provided with a supper of cooked vegetables, manioc flour, and fruits.<sup>47</sup> The historians Iraci Costa and Renato Marcondes collected data about slave diet from several foreign travelers, which may aid us to reconstruct the regional differences regarding feeding among slaves in Brazil (see table 5).

Although the testimonies of foreign travelers cannot be taken as fully reliable pieces of evidence, their relative uniformity is sufficient to trace a broad picture of slave feeding in Brazil. For a basic question of economic rationality, the slaveholders tended to feed their captives with a standardized diet consisted on cheap foodstuffs supplied by own plantations or local suppliers. In general, a daily customary allotment comprised: *a*) a ration of carbohydrates in form of manioc flour (Pernambuco, Recôncavo, Rio), cornmeal (Minas, Sao Paulo), and/or rice (Rio); *b*) a portion of animal protein in form of dried meat or “carne seca” (Pernambuco, Recôncavo, Rio), fresh meat (Minas), bacon (Rio, Sao Paulo, Minas), fish (Pernambuco, Recôncavo, Rio, Minas), whale fish (Recôncavo), chicken (Recôncavo), and/or crustaceans (Rio); *c*) vegetables such as beans or “feijão” (Rio, Sao Paulo, Minas), and pumpkin (Recôncavo); *d*) fruits such as bananas (Recôncavo, Rio), orange (Rio, Sao Paulo), and/or coconut (Recôncavo), and *e*) stimulants such as sugar (Recôncavo, Rio), coffee (Rio), rum or *cachaça* (Rio, Minas), and/or tobacco or *fumo de rolo* (Minas).

Typically, slaves received three meals by day with no more than four or five types of staple food: cornmeal or manioc flour, and meat (dried or fresh). The provision of vegetables and fruits was irregular and conditioned to seasonal availability. Finally, stimulants were offered to the captives to encourage them to work in periods of intense demand of labor. On base of the historical sources regarding feeding patterns, Warren Fish made a map to describe regional distribution of foodstuffs in Brazil (see graph 1).

<sup>43</sup> Fresh meat was only offered to sick slaves.

<sup>44</sup> Rice was introduced in Ilheus in 1730.

<sup>45</sup> Bahia was the center of whaling industry in Southern Atlantic.

<sup>46</sup> Schwartz, *Sugar*, 1985, p. 138.

<sup>47</sup> *Ibid.*

TABLE 5. TESTIMONIES ABOUT THE TYPICAL SLAVE DIET IN BRAZIL

<i>Witness</i>	<i>Nation</i>	<i>Years in Brazil</i>	<i>Region</i>	<i>Manioc</i>		<i>Beans</i>	<i>Bananas</i>	<i>Bacon</i>	<i>Cornmeal</i>	<i>Rice</i>	<i>Fresh meat</i>	<i>Fish</i>	<i>Other</i>
				<i>flour</i>	<i>dried meat</i>								
Friedrich von Weech	German	1823-1827		X	X	X	X						Orange
Johann Moritz Rugendas	German	1830s		X	X	X	X						
Henry Koster	English	1815-1816	Pernambuco	X	X							X	
Jean Ferdinand Denis	French	1816-1831	Recôncavo? <sup>a</sup>	X	X		X					X	Whale meat, pumpkin, sugar
Louis-François de Tollenare	French	1816	Recôncavo	X	X								
Maria Graham	English	1821	Recôncavo	X	X								Chicken, pumpkin, coconut
Jean -Baptiste Debret	French	1816-1831	Rio de Janeiro	X	X	X	X		X				Orange
Auguste de Saint-Hilaire	French	1818	Rio de Janeiro	X	X	X							
Carl Seidler	German	1820s	Rio de Janeiro	X		X	X				X		
J.J. Tschudi	German	1850s	Rio de Janeiro		X	X	X		X			X	Coffee, sugar, <i>cachaça</i>

<i>Witness</i>	<i>Nation</i>	<i>Years in Brazil</i>	<i>Region</i>	<i>Manioc</i>		<i>Beans</i>	<i>Bananas</i>	<i>Bacon</i>	<i>Cornmeal</i>	<i>Rice</i>	<i>Fresh</i>			
				<i>flour</i>	<i>meat</i>						<i>meat</i>	<i>meat</i>	<i>Fish</i>	<i>Other</i>
Antonio Jose de Souza	Brazilian	1851	Rio de Janeiro	X	X	X			X	X				Crustaceans
Antonio Pinto Correa	Brazilian	1869	Rio de Janeiro		X	X								
Hermann Burmeister	German	1850-1851	Rio and Minas	X		X		X						
F. A. Veiga de Castro	Brazilian	1862	Sao Paulo			X		X	X		X			Orange
John Mawe	English	1809	Minas Gerais			X		X	X					
Auguste de Saint-Hilaire	French	1817	Minas Gerais					X	X		X			Tobacco
Johann Baptiste von Spix & Carl Friedrich Phillip von Martius	German	1818	Minas Gerais			X		X	X					<i>Cachaça</i>
Alcides D'Orbigny	French	1832	Minas Gerais	X		X			X					Tobacco
Cunha Matos	Brazilian	1837	Minas Gerais						X	X	X	X		

<sup>a</sup> Not confirmed local by the source.

Source: Costa and Marcondes, "Alimentação", 2001, pp. 199-246.

GRAPH 1: REGIONAL DISTRIBUTION OF FOODSTUFFS IN BRAZIL

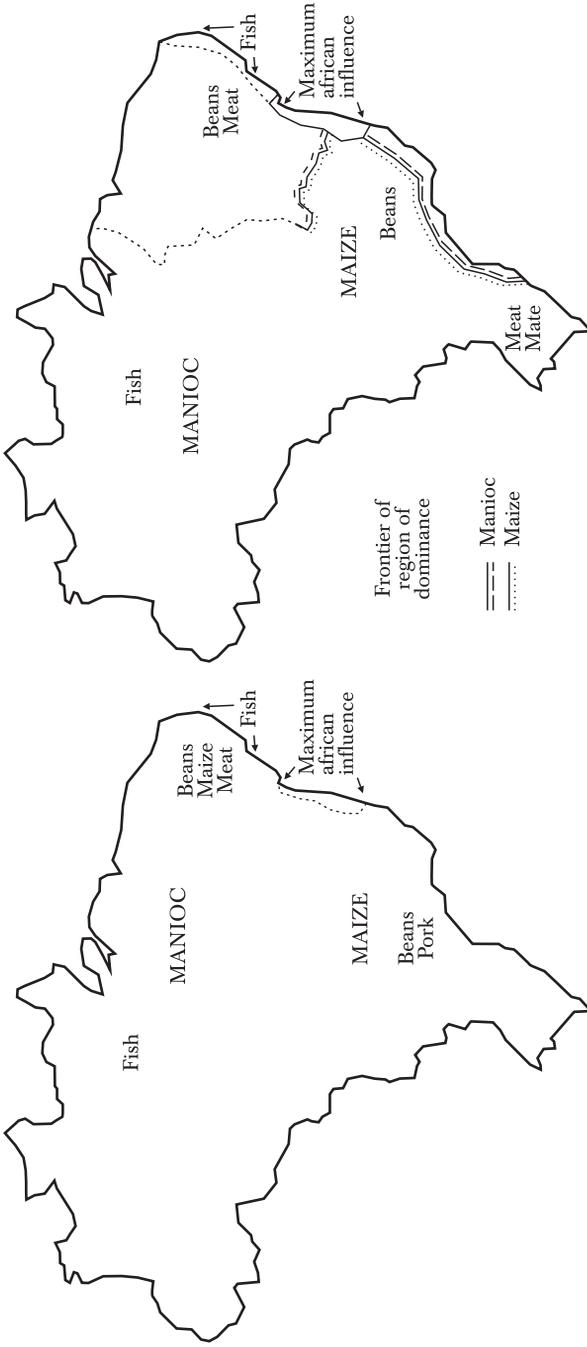


Figure 1. Food use patterns in Brazil. Circa 1690.

Figure 2. Food use patterns in Brazil. Circa 1790.

Source: Fish, "Changing", 1978, p. 71.

The nutritional content of diet also depends on the quality and condition of the food. Numerous contemporary testimonies reveal how slaves were provided with poor-quality-rotten foodstuff whose dietary potential were not only minimal but also absolutely inappropriate for human feeding. The physician Joao Imbert, who was not precisely sympathetic to the condition of slaves, asserted that they were provided with spoiled food that caused them many stomach disorders.<sup>48</sup> The captives not even could rely on the foodstuff sold by local butchers or street vendors since they often took advantage of the poverty and ignorance of coloureds and slaves to sell them their spoiled stocks.<sup>49</sup>

It would be a mistake to think that slaves were content only with the food offered by their masters. In fact, they were willing to do whatever they could to improve their staple diet by different means such as catch, scavenge, gather, hunt, or steal food. The colonial and Church authorities were not indifferent to the sad condition of starved slaves for which they issued several laws to force plantation owners to improve the feeding regime of their chattel enslaves. For instance, the Council of India (which administered Brazilian possessions) recommended granting a free off day to slaves in order to cultivate small plots for getting their own food.<sup>50</sup> Although the idea attracted private entrepreneurs who pursued to cut costs, most of them disagreed with the Church's proposal of granting Saturdays in order to respect the sacred Sabbath. In practice, each planter had a great deal of independence to decide in this regard.<sup>51</sup> Even if planters refused to fulfill the official edicts about time off on Saturdays, the Brazilian slaves could consider themselves as fortunate in comparison to their American counterparts, because they had at least 35 religious holidays plus the Sundays at their disposal to work in their own plots to raise food. According to the German traveler Henry Koster, slaves sold an important share of their production to save money for purchasing their liberty.<sup>52</sup>

Due to the lack of specific data in relation to nutritional content of slave diet, historians have sought alternative ways to determine the potential deficiencies in the patterns of slave feeding by means of the study of diseases related to nutritional deficits. One of the most prevalent diseases in the 19<sup>th</sup> century among Brazilian slaves was the beriberi. Its geographical distribution shows a remarkable pattern: a high incidence in Bahia, Rio

<sup>48</sup> Schwartz, *Sugar*, 1985, p. 137.

<sup>49</sup> Russell-Wood, *Black*, 1982, p. 118.

<sup>50</sup> *Ibid.*, pp. 137-138.

<sup>51</sup> According to the *estatuto do fazendeiro*, slaves only could work on Sundays or religious holidays in case of danger situations or urgent maintenance works in plantation. Castro, "Fazendeiro", 1944, p. 40.

<sup>52</sup> Koster, *Viagens*, 1942, pp. 494-495.

de Janeiro and Sao Paulo while it was almost nonexistent in Minas Gerais and Rio Grande do Sul. For Kenneth Kiple, beriberi was associated with wide consumption of manioc flour (*farinha de mandioca*) whose content of thiamine is even less than a poor thiamine-cereal such as rice. However it does not explain why some populations who consumed manioc flour were not getting sick. Kiple hypothesizes that beriberi was directly related to a low fat diet, since it increases the corporal demand of thiamine. Hence such disease was basically common among slaves with a low fat diet such as those ones from Bahia, Rio de Janeiro and Sao Paulo who consumed dried meat. Conversely, the prevalence of beriberi was quite low in Minas Gerais and Rio Grande do Sul where slaves consumed large rations of big fat meat in form of bacon and fresh meat. The Brazilian authorities also reported the recurrent slave practice of eating earthy (geophagy) that wrongly deemed as a disgusting African tradition when it was basically the expression of an acute lack of essential minerals in slave diet. The authorities issued some regulations to halt this practice such as the compulsive use of iron masks for transgressor captives.<sup>53</sup>

Another clear indicator of nutritional issues was the high incidence of certain diseases related to children's growth such as rickets. This disorder, which affects the normal development of bones in children with deficiency of vitamin D, was related to the customary practice of extending the breastfeeding for two or three years among slave women. The reliance on maternal lactation led to chronic malnutrition due to the lack of key nutrients such as vitamins, iron, proteins and calcium. Although rickets may impair children from both sexes, such disorder was especially harmful for young girls, since it severely affects their ability to bear live children. African slave children were also impaired by debilitating diseases during the Atlantic passage such as pellagra and scurvy, which might eventually have caused irreparable damage on their corporal and mental development. Beyond any specific nutritional disorder, the inadequate feeding of pregnant and lactating women and infants largely reduced the natural ability of slave population to breed.<sup>54</sup> Then, demographic growth of slave populations in Brazil primarily relied on the steady import of African forced labor until mid-nineteenth century.

<sup>53</sup> Carneiro, *Antologia*, 1950, p. 98.

<sup>54</sup> Karash, *Slave*, 1972, pp. 173-181.

## CONCLUSION

Food was one of the key expenses of any slaveholding since it provided the energy that put in motion human machines of which depended on the fate of vast agricultural enterprises. Not surprisingly, slave feeding was one of the most expensive items in the plantation budgets from all the Americas. It would be expected, therefore, that foodstuff offered to slaves were both plentiful and varied to meet their nutritional requirements. But the historical sources show consistent evidence that slave feeding was not precisely complete and adequate according to modern standards.

In order to answer specific questions regarding to the nutritional potential of slave diet, historians have had to resort to the collaboration of scholars from other disciplines. In fact, the study of slave feeding is perhaps one of the most productive fields for the interdisciplinary work, since it gathers efforts from several specialists in different sciences such as Anthropology, Archeology, Medicine, and Economy. Even so, there are still obstacles to undertake a research from a more ambitious continental scope. The first one has to do with the disparity of resources devoted to new research. Indeed, most of the scholarly contributions in matter of slave feeding come from The United States due to the key importance of slavery in the American historiography and –more important– to the generous financial support for research projects in such field. It is possible as well to find interesting works for the case of the former English, French and Spanish dominions in the Caribbean, or even for Brazil. But the intellectual production in such topic is almost nonexistent in the continental Spanish colonies. Even so, I think there are good chances of undertaking a comparative study that embrace all regions of the Americas thanks to the increasing number of new scholarly publications related living conditions of slave populations.

The second major obstacle is the disparity of data collected from historical sources. Since the slaveholding management style was highly diverse throughout of the Americas, the data from plantations' records related to feeding and physical condition of slaves may show considerable differences. This is particularly problematic in the case of quantitative data regarding to physical indexes (sex, age, height, origin) or specific quantities of foodstuffs in slave diet. The fact that the English planters kept a more careful detailed record of their chattel slaves that their Portuguese or Spanish counterparts would explain the relative success of cliometric studies about slavery in The United States and the former English Caribbean colonies in comparison with the poor quantitative production in Latin America.

The topic of slave diet has been tackled from multiple dimensions. At the beginning, historians just paid attention to the subjective hunger sensation. Although historical sources offer mixed opinions in this regard, scholars are inclined to think that slaves could have undergone episodes of hunger probably induced by masters as a form of punishment, but rarely a permanent state of famine. Moreover, slaves were not passive food recipients, since they actively sought to supplement their diet with opportunistic strategies such as cultivate garden plots, hunt little animals or steal food, which eventually helped them to overcome any food shortage.

Even so the daily allotment offered to captives conferred a sense of satiety, it does not necessarily met their nutritional demands. Researchers who pursue to answer this question have to deal with a first obstacle: the existence of quantitative sources. Given the fact that quantitative data is mostly available in former English colonies and much rarer in regions of former Portuguese and Spanish colonization, comparative studies in this matter primarily embraces The United States and certain regions of the Caribbean. The first issue related to nutritional content of slave diet has to do with the variety of foodstuff. At glance, it seems that slave diet was quite monotonous in all regions of the Americas, since it basically comprised a ration of cereal and meat: cornmeal and pork in US Southern plantations; cornmeal or rice, and beef or fish in the Caribbean; manioc flour or cornmeal, and dried meat or bacon in Brazil. Foods were not chosen because of their nutritional properties, but their availability and low price. This daily allotment was supplemented with vegetables, fruits, and some stimulants (liquor, coffee, tobacco, and sugar) to encourage slaves to work during seasonal periods of high demand of labor. In any case, feeding was not conceived to please the palate of slaves, but simply to provide them enough energy to work. In few words, feeding was not a pleasure, but a necessity.

Did the fact that slave diet was monotonous mean that it was deficient in nutritional terms? Most scholars suggest that this equation is correct on base of traditional medical knowledge, but cliometric historians challenged this viewpoint in the case of Southern US plantations, alleging that the slave diet fully met the energetic requirements of hard physical work and was only deficient in few specific elements. However their statistical methods have been put on question by some critics due to problematic issues such as the sample size or the use of indirect evidence to prove their points.

The fact that the slave rations were monotonous did not imply that it was not nutritious. As a matter of fact, scholars have found that the slave diet in The United States and the Caribbean might have met the energy requirements and even the recommended daily allotment of proteins. However, there was evidence about the deficiency of key nutrients in the daily

ration, which might have caused some diseases such as beriberi, pellagra, or night blindness.

It would be a mistake to consider that the slaves accepted with resignation their usually poor daily allotment. Rather, they resorted to different means to get food: work in their own garden plots to cultivate vegetables and fruits that they could trade in the local market, beg and steal food, hunt or fish, and so forth. It is demonstrated that they actively employed strategies to increase their provision of foodstuffs, which became a necessary supplement of their monotonous diets.

Making use of the evidence of slave heights, the scholars drew the conclusion that United States slaves were better fed than their counterparts in the Caribbean. Remarkably, the US slaves were also taller than the American and European free workers in the 19<sup>th</sup> century. This famous “Antebellum puzzle” reveals the profound changes in the distribution of income during the first stage of industrialization which led to the pauperization of the working classes in cities, but the slave living conditions remained the same. Unfortunately we do not have a study of Brazilian slave heights which could help to compare the physical condition of Brazilian slaves in comparison with slaves of North America and the Caribbean.

Finally, there is plenty of evidence to state that malnutrition affected basically the infant and children slaves. To be dependent on the milk of their mothers who surely were underfed, led many children to suffer different illnesses which would explain the high rate of infant mortality among the slave population in the Americas. If those slave societies were unable to raise enough children to maintain demographic vitality, it would make necessary to increase the importation of African slaves. However, the ability of newcomers to reproduce themselves was inferior to that of the local population, which inevitably led to a drop in the rate of growth. The United States was the only country where the slave population increased during the 19<sup>th</sup> century, although its rate of infant mortality was quite high. Even so, further research must be done to answer many questions regarding the interesting topic of the slave diet in the Americas.

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