APPETITE FOR BEEF: 
THE QUANTITY AND QUALITY OF GOTHAM’S MEAT SUPPLY, 1780-1860

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Abstract
This paper provides new insights into urban meat consumption patterns in early 19th century America through a case-study of New York City, focusing on three issues: quantity, quality and inequality. First, the paper introduces new data for the three decades between 1790 and 1818, showing that New Yorkers enjoyed historically high levels of meat consumption in this period. Complementing the findings of other scholars who suggested that average per capita meat consumption declined from the mid-1830s, a wide range of indirect evidence is presented to make the case that this negative trend was not triggered, but exacerbated by the recession of 1837/43. Second, the paper explores how New York’s shift from a tightly regulated public market system to a deregulated model of provisioning—completed in 1843—affected the quality of the city’s meat supplies. Even as increasingly deregulated food markets made it easier for residents to buy provisions near to their homes, the price to be paid for greater convenience was the deterioration of the quality of fresh meat supplies. Lastly, the paper documents the process by which in an increasingly immigrant working-class city, social inequalities in access to food became intimately tied to intensifying residential segregation based on income and ethnicity.

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Introduction: The Antebellum Puzzle

Anthropometric history has opened an intriguing new chapter in the standard of living debate. The term Antebellum puzzle refers to the three decades prior to the Civil War characterized by the perplexing combination of rapid economic growth and growing per capita income on the one hand, and deteriorating biological standard of living, in particular, declining physical stature and rising mortality, on the other. Declining body heights for cohorts born from about 1830 to 1860 was first noted among white Union Army recruits, and has later been found among West Point cadets, free blacks in Maryland and Virginia, Georgia convicts, and Ohio National Guardsmen. Further research confirmed that the phenomenon was not confined to the United States, but body heights declined in Britain, Sweden, the Habsburg Monarchy, and Bavaria in the mid- to late 18th century, while the American cycle in the mid-19th century had its European counterparts in Britain and the Netherlands.

Scholars have proposed two distinct lines of explanation: changing diets and worsening disease environments. The nutritional thesis asserts that the amount of protein consumed in infancy, childhood and adolescence has a positive impact on adult body height. In this sense, body height is a proxy for meat consumption, a telling testimony to changing living standards. In his study of West Point cadets, John Komlos set the direction of the debate by making the case for deteriorating diets. He concluded that “after 1839, average calorie and protein intake declined and did not reach its earlier level again until the 1870s.” His reasoning was that productivity gains in agriculture lagged behind the growing demand for food that was a result of population growth and urbanization. Per capita food output declined, while rising relative food prices also pushed consumers to substitute carbohydrates for meat. As the depth and geographic scope of anthropometric research grew, Komlos also included other factors into this explanatory framework. He asserted that rising income inequality must have decreased meat consumption disproportionately for lower income groups. He also pointed to two periods of contractions in the United States (1837/43 and 1848/55) with high unemployment, which probably negatively impacted food budgets. Moreover, he emphasized that town-dwellers paid a premium for having to import food from ever greater distances. As the urban population grew 5% per annum from 1800 to 1860, the urban variable increasingly mattered.

Given the importance of protein intake in determining physical stature, Komlos also centered the debate on changing patterns of meat consumption. For data, he turned to production
figures from the federal censuses. Besides methodological concerns, the census data leave the period prior to 1839 unaccounted for. Michael Haines addressed this problem by using the New York State census, which provides production figures from 1825. When calculating per capita selected livestock, milk and milk products, he excluded New York City, as it imported all of its food, and much of it from out of state. It is also unclear what percentage of the livestock was consumed locally or exported to cities. Haines’s figures thus do not refer to actual consumption rates, but instead suggest relative consumption. In any case, the data confirm Komlos’s thesis, suggesting deteriorating meat consumption rates already between 1825 and 1835. But one important question remains. Was the decline part of a longer trend, or did the decline begin in the 1830s? There are virtually no data prior to Haines’s to make either case. If the decline occurred from a higher equilibrium, the explanation of dietary transition is more robust. But if the decline was part of a longer trend, it remains to be explained why body height deteriorated only for birth cohorts from around 1830.

Haines also reoriented the discussion to address both nutrition and mortality. Using new data to assess the mortality case, Haines, Craig and Weiss found that the urban share of a county’s population and a county’s access to regional transportation networks produced higher crude death rates. Their data did not support the Malthusian thesis of falling per capita nutrition resulting in higher mortality. However, a small but positive relationship was found between regional specialization in agricultural production and mortality. The logic behind this was that commercial farming resulted in more specialized—that is less diversified—regional agricultural production, which in turn, contributed to the deteriorating composition of local diets. Looking at stature, the authors turned to new data on the white Union Army regiments collected by Robert Fogel, Stanley Engerman, et al. They found that both the quantity and quality of the food supply in infancy and childhood mattered. Growing up in a county with a net surplus of protein increased adult body height, while the trend towards regional specialization in agriculture had a slightly negative impact. The data also provide evidence for the importance of deteriorating mortality environment. Spending infancy and childhood in a county with higher death rates resulted in lower adult body height, and so did growing up in a more urbanized county or in a county with better access to transportation. Farmers also tended to be taller than laborers, offering further evidence of the negative impact of urbanization. In this revised model, the authors concluded that the Antebellum puzzle “resulted from a complex set of factors, including
urbanization, increased population mobility, worsening mortality conditions, greater contact via improved transport infrastructure, and deteriorating nutrition.” Growing per capita income in the Antebellum United States “was partly purchased at a price of some deterioration of the biological standard of living.”\textsuperscript{12}

Placing emphasis on the disease environment puts a premium on urbanization in explaining the phenomenon. The fact that population concentration negatively impacted mortality across the Western world until public health reforms were able to reverse the trend from the latter half of the 19\textsuperscript{th} century is well-established in the literature.\textsuperscript{13} But a closer look at cities provides more to think about the nutritional thesis. Cities by definition rely on the countryside to sustain residents. It is probably true that when overall meat supply falls, city dwellers also suffer, perhaps even more than those living in rural areas. Haines, Craig and Weiss in fact find such a relationship when they show that growing up in a county that produced a net protein surplus had a positive impact on body height. The reverse case is probably also true: if there is plenty of livestock city dwellers also tend to eat better. The problem with either logic is that urban provisioning is a mediated process, whereby sufficient supply is a necessary, but insufficient condition. It is not enough to transport the livestock into the city, but it also matters that a series of mediating institutions function properly so that the animals be slaughtered, processed and retailed to urban dwellers. It is conceivable that even if there is sufficient supply to reach the city, a poorly managed infrastructure of provisioning would negatively impact residents’ nutritional status.

A closer look at the market-system and butchering in New York City during the first half of the long 19\textsuperscript{th} century allows for a better understanding of the process by which livestock landed on the consumer’s dinner plate as meat. In particular, the quantity and quality of the meat supply are of major concern. Declining quantity has been the focus of the standard of living debate, and I will directly address this problem, in part, by incorporating new consumption data for the period prior to 1820, and also by examining how increasing demand due to urban growth put pressure on the city’s infrastructure of provisioning. The equally important issue of quality, however, has largely escaped the attention of scholars. One contribution of this paper is an attempt to shed new light onto the more elusive problem of the quality of city dwellers’ food supplies by concentrating on the core institutions of urban provisioning. Both Komlos and Haines point out that urbanization required food to be transported across larger distances, while
commercialization increasingly separated the producer from the consumer, which factors in turn caused greater concerns over the quality of fresh food, in particular meat and milk. Yet to arrive at even suggestive answers about quality, one has to move below the national level. Haines called for more research at disaggregated data—states, counties, and specific cities. In what follows, I will address the central issues of both the quantity and quality of the urban meat supplies through a case-study of America’s first metropolis.

(1) Quantity of the Meat Supply, 1790-1818

The first objective of this paper is to establish how much meat on average New Yorkers consumed during the early Republican period. What makes the estimation possible is new datasets based on two different series of archival records, both of which were generated by the municipal government. These sources were produced as a result of one specific condition of urban food provisioning in early America, which was codified by the market laws. In New York City, as in most other American cities, minor exceptions notwithstanding, the City Council limited the retail of the four principal categories of fresh meat—beef, veal, lamb and mutton, and pork—to licensed market butchers at the city’s public markets. The underlying intent of this crucial clause—commonly referred to as the “market monopoly of meat”—was to maintain strict municipal oversight of the most important and perishable component of the urban food supply, chiefly for reasons of public health. Market butchers, in return for their trade privilege, as well as to finance the upkeep and expansion of the collective infrastructure of food provisioning for a rapidly growing city, paid sales taxes after the different varieties of fresh meat were sold.

The highly restricted meat trade, in turn, concentrated the sale of all fresh provisions, including fish and shell fish, vegetables and fruits, at the city’s markets. Customarily, market vendors, selling fresh food, and grocers, selling dry food, complemented each other. From around the second quarter of the 19th century, however, market vendors faced mounting competition from outside retailers. By the mid-1830s, as the municipal government failed to expand the market infrastructure to keep up with accelerated spatial and population growth, the overstretched market system was ever more frequently circumvented by a burgeoning informal economy, whereby meat and all other provisions were sold by grocers at retail out of stores or from homes, or by peddlers on the street. Eventually, the Common Council, New York City’s legislative body, broke with centuries of traditions, and deregulated the market system in 1843.
To estimate the quantity of fresh red meat consumed by New Yorkers in the early 19th century, I have drawn on a hitherto unused set of sources: the monthly returns of the Market Clerks, which recorded the number of animals slaughtered for sale at the city’s public markets. Market Clerks were required to register and collect fees on each and every cow, calf, sheep and hog processed at their respective marketplaces. On a monthly basis, they then submitted these returns to the City Comptroller; a substantial amount of these returns has survived for 1816 and 1818 for the city’s three principal markets of Fly, Washington, and Catharine. Additionally, the butcher-turned-historian Thomas F. De Voe’s published works—*The Market Book* (1862) and *The Market Assistant* (1867)—along with his manuscript records, contain complementary sheets of these returns for the missing periods. Combining these two sources, I have been able to make reliable estimates of the total number of cattle, calves, sheep and hogs slaughtered in New York City in 1816 and 1818.

In addition to this, the Proceedings of the City Council document the amount of market fees collected from the market butchers between 1790 and 1818. Given that fees were collected in the form of sales taxes on the amount of meat sold, and that the tax rates applied to the different kinds of meats, it is possible to estimate the actual volume of meat sales for most of the years during this period. Overall, combining these two sets of data makes it possible for the first time to measure per capita red meat consumption in a major American city of the early Republic—and not only for one year, but for nearly three decades.

One should note that the data have two important limitations. The City Council collected revenue only on the sale of butcher’s meats. All other meats, including poultry, fowl and game, which were sold by farmers and hucksters at the city’s markets, as well as processed and preserved meats, such as ham, sausage, lard, salted pork and beef, smoked beef, or corned beef, which were retailed by the city’s grocers, fell outside the remit of municipal taxation. Any attempt to quantify per capita meat consumption is therefore necessarily limited to red meat, leaving a substantial portion of the urban meat supply unaccounted for. Based on the Market Clerk’s monthly returns, complemented by De Voe’s records, my per capita red meat consumption estimates are as follows: in the late 1810s, New Yorkers on average ate between 85.9 to 92.1 pounds of beef, 16.9 to 19.6 pounds of veal, 28.6 to 34.1 pounds of lamb and mutton, and 10.7 to 13.5 pounds of pork—for all categories, the year of 1816 representing the
upper, while the year of 1818 the lower bound.\textsuperscript{20} On the whole then, annual per capita fresh red meat consumption reached 159.3 pounds in 1816 and 142 pounds in 1818.

Two caveats are in order. First, these figures are likely to slightly underestimate per capita butcher’s meat consumption, as they refer to animals officially accounted for and prepared and sold by licensed butchers at the city’s public markets. Given the “market monopoly of meat,” this should have been the whole supply. Yet despite a well-functioning and strictly enforced public market system at the time, there was already evidence of some informal trade. It is also unlikely that Market Clerks managed to count all animals sold by the butchers. Butchers paid taxes after each and every animal was slaughtered, and thus had the incentive not to report all sales. The figures, on the other hand, may also slightly overestimate per capita consumption. By 1810, New York surpassed Philadelphia to become North America’s most populous city and greatest emporium of commerce.\textsuperscript{21} At any given day, there were many thousands more eating butcher’s meat in New York than there were residents. It is impossible to know which factor was more important, and to what extent the two cancelled each other out.

But before continuing with the analysis: are these figures realistic for the North American context? Roger Horowitz offers precise estimates of urban meat consumption levels for the 20\textsuperscript{th} century. In 1909, per capita meat consumption ranged from an average of 136.1 pounds for lower-income families, to 163.7 pounds for middle, and to 201.6 pounds for higher-income families. By 1942, the Depression pushed total meat consumption for the respective income groups down to 107.5, 143.6, and 166.1 pounds. Yet by 1965, per capita meat consumption reached record levels with figures as high as 205.2 pounds for lower, 219.4 pounds for middle, and 230.2 pounds for higher income families.\textsuperscript{22} In addition, the U.S. Department of Commerce estimated that on average Americans ate 81.5 pounds of beef in 1909, dropping to 69.4 pounds by 1942, and reaching a staggering 104.7 pounds by 1965.\textsuperscript{23} In comparison to these figures, the market data indicate high, but by no means unrealistic levels of meat consumption for the late 1810s.

The years 1816 and 1818, however, are only two cases in point. They are also too close to each other to suggest any trend, and while unlikely, it is possible that they refer to exceptional years, which might explain the high consumption figures. Further evidence is needed to expand the chronology and thus solidify the consumption estimates. For each year between 1790 and 1800, and for some of the years between 1801 and 1816, the Proceedings of the Common
Council report the fees Market Clerks collected on the total amount of meat sold. Given that the respective fees for the four kinds of butcher’s meats—beef, veal, lamb and mutton, and pork—remained largely unchanged, and that the market laws limited the sale of fresh meat to the public markets, the market fees reflect relative levels of meat consumption over the period.

Figure 1 compares the increase of New York City’s population to that of the market fees collected on the sales of fresh butcher’s meats—beef, veal, lamb and mutton, and pork—between 1790 and 1818. It clearly shows how market fees grew at about the same rate as did the city’s population between 1790 and 1807. For the subsequent decade, the data are more sporadic, and the interpretation is more difficult. Yet it is evident that the war of 1812 caused a temporary collapse in meat sales in 1813—and probably in 1814—, after which market fees rebounded to the same level vis-à-vis the population as before. De Voe himself noted that the prices of provisions became very high at the commencement of the war, and continued so for five or six years, resulting in notable scarcities in supplies. Yet exorbitant prices were only part of the story, as meat sales swiftly recovered by 1816, despite prices remaining high. The war not only disrupted the city’s connections to its hinterlands, causing shortages in meat supplies, but also interrupted the day-to-day functioning of the city’s vital institutions, including its infrastructure of provisioning. It took some time for the markets to fully recover, and for the city’s butchers to resume business.

Although the war of 1812 presented the sharpest setback, food consumption levels were not immune to other external shocks. After five years of steady growth, market fees remained flat from 1794 to 1795, when yellow fever hit New York for the first time, claiming the lives of 1.6% of the city’s population. Three years later, in 1798, market fees dropped by a shocking
14.2% compared to the year before, as the most devastating yellow fever wiped out nearly 4% of the city’s population, and sent thousands into the countryside.\textsuperscript{29} For the epidemic of 1803, there are no corresponding market data, while in 1805 market fees continued to rise despite a milder yellow fever outbreak.\textsuperscript{30} The drop from 1806 to 1807, however, is more noteworthy, as it corresponds to the 1807 Embargo Act. New York City’s meat supplies derived from regional sources, and thus the embargo did not directly hurt the meat trade. But for a commercial city, the interruption of foreign trade presented a severe economic setback, which in turn, manifested in a 4.2% decline in the volume of meat sales.\textsuperscript{31}

Despite setbacks caused by epidemics, the embargo of 1807, or the war of 1812, the market fee data provide strong evidence for the steady growth of the city’s meat supplies between 1790 and 1818. The consistency of the series is confirmed by its responsiveness to external shocks. Moreover, fees calculated from the original market returns of 1816 and 1818—which were based on animal counts—fit remarkably well into the dataset. Earlier, I used the original market returns to calculate per capita meat consumption levels for 1816 and 1818. Given the reliability of the market fee data, it makes sense to convert fees into meat consumption figures for the two-and-a-half decades prior to 1816. For such a conversion, one needs to know the relative importance of the four kinds of butcher’s meat throughout the period. Lacking such data, my estimations make a reasonable, but not unproblematic assumption: that the 1816 ratios between the sales of beef, veal, lamb and mutton, and fresh pork reflected stable consumption patterns.\textsuperscript{32}

Table 1 summarizes per capita meat consumption estimates for New York between 1790 and 1818. Even if the data are far from perfect, they provide new insights into urban meat consumption levels for an undocumented period. The figures show that per capita consumption of fresh red meat increased from 132.3 pounds in 1790 to rates as high as 154.7 to 166.5 pounds between 1795 and 1816—excluding the war year of 1813, when it dropped back to 131.6 pounds. The corresponding rates of beef consumption rose from 76.5 pounds in 1790 to 89.5 to 96.3 pounds between 1795 and 1816. Importantly, the 1818 figures indicate a sharp decline in per capita red meat consumption compared to two years earlier from 159.3 pounds to 142 pounds. No external shock explains this drop, but there is good evidence that the 1818 data are likely to underestimate the overall number of animals butchered in New York, in which case the 1818 rates were probably much closer to those of 1816 than the figures would suggest.\textsuperscript{33}
Table 1:
Per capita butcher’s meat consumption in NYC (lbs), 1790-1818

<table>
<thead>
<tr>
<th>Years</th>
<th>Beef</th>
<th>Veal</th>
<th>Lamb &amp; mutton</th>
<th>Pork</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>1790</td>
<td>76.5</td>
<td>16.3</td>
<td>28.3</td>
<td>11.2</td>
<td>132.3</td>
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<tr>
<td>1795</td>
<td>96.3</td>
<td>20.5</td>
<td>35.7</td>
<td>14.1</td>
<td>166.5</td>
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<td>1800</td>
<td>89.5</td>
<td>19.0</td>
<td>33.1</td>
<td>13.1</td>
<td>154.7</td>
</tr>
<tr>
<td>1805</td>
<td>93.2</td>
<td>19.8</td>
<td>34.5</td>
<td>13.6</td>
<td>161.2</td>
</tr>
<tr>
<td>1813</td>
<td>76.1</td>
<td>16.2</td>
<td>28.2</td>
<td>11.1</td>
<td>131.6</td>
</tr>
<tr>
<td>1816</td>
<td>92.1</td>
<td>19.6</td>
<td>34.1</td>
<td>13.5</td>
<td>159.3</td>
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<tr>
<td>1818</td>
<td>85.9</td>
<td>16.9</td>
<td>28.6</td>
<td>10.7</td>
<td>142.0</td>
</tr>
</tbody>
</table>

Table 2:
Estimated meat consumption in North America (lbs), 1740-1830

<table>
<thead>
<tr>
<th>Period</th>
<th>Widow rate</th>
<th>Widow rate</th>
<th>Labourer</th>
<th>Per capita</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All meats</td>
<td>All meats</td>
<td>All meats</td>
<td>Butcher’s meats</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middlesex Co.</td>
<td>SE PA</td>
<td>Philadelphia</td>
<td>NYC</td>
<td></td>
</tr>
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<td>1740-59</td>
<td>168.2</td>
<td>150.0</td>
<td>174.5</td>
<td>132.3</td>
<td>1790</td>
</tr>
<tr>
<td>1760-78</td>
<td>183.5</td>
<td>174.5</td>
<td>1795</td>
<td>166.5</td>
<td>1795</td>
</tr>
<tr>
<td>1781-99</td>
<td>178.0</td>
<td></td>
<td>154.7</td>
<td>1800</td>
<td>1800</td>
</tr>
<tr>
<td>1800</td>
<td></td>
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<td>161.2</td>
<td>1805</td>
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<td>1808-15</td>
<td>201.8</td>
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<td>131.6</td>
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<td>1816-17</td>
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<td>159.3</td>
<td>1816</td>
<td>1816</td>
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<tr>
<td>1818-30</td>
<td></td>
<td></td>
<td>142.0</td>
<td>1818</td>
<td>1818</td>
</tr>
</tbody>
</table>

The data confirm the earlier tentative claim based on 20th century comparisons that New Yorkers were well-supplied with fresh meat in general and beef in particular. It also extends the chronology backward, allowing for further comparisons from similar observations across the period. Table 2 presents comparative data concerning average meat consumption levels in the Northeastern region during the latter half of the 18th and early 19th centuries. The best estimates for the Colonial and early Republican periods come from Sarah F. McMahon’s meticulous studies of a large sample of wills from rural Middlesex County in Massachusetts. She shows that the yearly meat allowance of widows grew gradually from 120.8 pounds in the early 18th century, to 168.2 pounds by the mid-century, to 183.5 pounds by the Revolutionary era, then it slightly decreased to 178 pounds during the last two decades of the century, to reach an impressive 201.8 pounds by the first quarter of the 19th century. James T. Lemon’s calculations based on similar sources from Southeastern Pennsylvania arrive at a lower figure of 150 pounds of meat for the second half of the 18th century. The difference most probably reflects regional variations in widow rates. In addition, Billy Smith’s attempt to reconstruct a
Philadelphia labourer’s diet for 1772 produces an overall meat consumption level of 174.5 pounds. This figure appears low compared to McMahon’s 183.5 pounds of widow rate if one considers the much greater calorie needs of an average urban labourer than a rural widow.

Even if widow rates are not the same as average per capita consumption, they provide a good idea of societal expectations of what constituted a reasonable supply of meat at any given time. And the New York City average of about 160.4 pounds of fresh butcher’s meat between 1795 and 1816—excluding the war year of 1813, and the probably underestimated figure for 1818—compares well with McMahon’s estimate of between 178 and 201.8 pounds of meat allowance for the late 18th and early 19th centuries. It is in fact surprising that the New York City figures are only slightly lower, given that, as I earlier noted, they exclude preserved meats (ham, sausage, lard, salted pork and beef, smoked beef, or corned beef) as well as poultry, fowl and game. If, on average, New Yorkers ate about 160 pounds of fresh red meat, there had to be plenty more on their dinner table once these categories are also accounted for, adding up to a total per capita meat consumption level well above McMahon’s rural averages.

The data also underline one profound difference between urban and rural diets. Horowitz notes that the consumption of fresh meat, beef in particular, was largely an urban privilege. Indeed, whereas almost all of McMahon’s estimates derive from preserved meats, New Yorkers first and foremost ate fresh red meat. Only in cities was demand sufficient and constant enough to maintain big supplies of slaughtered and retailed beef for immediate consumption.

The primacy of fresh meat contributed to yet another important distinctive feature of the urban diet: city residents experienced seasonal variations in their supplies of meat more markedly than rural dwellers. Looking more closely at the Market Clerk’s monthly returns from 1816, figure 2 charts the monthly rates of sales for beef, veal, lamb and mutton, and pork, while figure 3 presents per capita monthly meat consumption estimates. The graphs reveal relatively low levels of seasonality for beef, and large seasonal fluctuations for the other three meats. The figures highlight how the supply of beef dominated the yearly cycle of red meat consumption. Throughout the year, New Yorkers had an appetite for beef. They compromised their beef consumption when veal came into season over the spring and early summer. Once veal was gone, the beef diet was complemented by lamb and mutton during the summer months, and by the late fall and early winter, Market Clerks registered the highest sales of beef matched by a peak in the sale of pork.
Overall, the red meat cycle sustained a reasonably constant rate of meat consumption throughout the year. Red meat consumption peaked in October, reaching 19.5 pounds per capita, and was lowest in February, when it dropped to 9.4 pounds. For most of the year, however, the average New Yorker could count on consuming an impressive ten to sixteen pounds of fresh red meat each month. The point is that the urban standard of living, in so far as meat consumption was concerned, depended on these strong complementary seasonal cycles, which ensured a stable supply of meat through the different months of the year, and then from one year to the next.

Returning to annual aggregates, one also wonders how meat consumption in New York compared to those of other rapidly growing cities outside the United States. Thanks to its highly centralized and closely monitored public abattoir system, data concerning the number of animals slaughtered for sale in Paris are exceptionally good. Table 3 compares my per capita estimates for New York to systematic evidence presented by Armand Husson in his *Les consommations de Paris* (1875). Accordingly, during the late 18th and early 19th centuries, the per capita annual consumption of beef, veal, lamb and mutton were strikingly similar in the two metropolises—pork is treated as a separate category, as in Paris, it also included cured meats (*charcuterie*).
Interestingly enough, not only the total amount of red meats consumed, but also their distribution in the diet was very similar. At first reading then, the data raise doubts about the conventional wisdom that 19th century Americans consumed far more meat, in particular beef, than Europeans.

Table 3:
Per capita butcher’s meat consumption in New York City and Paris (lbs), 1781-1818

<table>
<thead>
<tr>
<th>Period</th>
<th>NYC</th>
<th>P</th>
<th>NYC</th>
<th>P</th>
<th>NYC</th>
<th>P</th>
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<th>P</th>
<th>NYC</th>
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<th>NYC</th>
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<tbody>
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<td>1786-88 &amp; 1790</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1781-86</td>
<td>80.4</td>
<td>88.3</td>
<td>17.1</td>
<td>12.6</td>
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<td>127.3</td>
<td>124.8</td>
<td>11.8</td>
<td>15.6</td>
<td>42.1</td>
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</tr>
<tr>
<td>1799-1802 &amp; 1804-07</td>
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<td>88.8</td>
<td>89</td>
<td>18.9</td>
<td>20.1</td>
<td>32.9</td>
<td>26.9</td>
<td>140.6</td>
<td>136.0</td>
<td>13.0</td>
<td>20.2</td>
<td>43.2</td>
<td></td>
</tr>
<tr>
<td>1816 &amp; 1818</td>
<td></td>
<td>89.0</td>
<td>88.8</td>
<td>18.2</td>
<td>17.5</td>
<td>31.3</td>
<td>26.2</td>
<td>138.6</td>
<td>132.6</td>
<td>12.1</td>
<td>25.5</td>
<td>44.8</td>
<td></td>
</tr>
</tbody>
</table>

A few qualifying remarks are in order. First, even if Parisian meat consumption rates were remarkably close to those of New York, the discrepancy between urban and rural diets was far greater in France than in the United States. Whereas Parisians ate three to four times as much meat as the average French citizen, rural New England widow rates, for example, were not all that different—at least in so far as quantity was concerned—from meat consumption levels in New York. Explaining the comparatively smaller inequality between urban and rural diets in North America presents an intriguing question for further research.

Besides, Parisian meat consumption appears unusually high by European standards. Even as systematic data for London are lacking, according to John Ramsay McCulloch’s calculations, in 1837, per capita meat consumption—exclusive of bacon, hams, salted provisions and poultry—reached 107 pounds. The London figure thus was about two-thirds that of early 19th century New York, albeit one should add that 1837 was the first year of a long recessionary cycle. Similarly, in the case of Berlin, the 1845 figure—including all red meats—was 104.7 pounds, while between 1854 and 1861, it stood at about 95.9 pounds, that is at much lower levels than in early 19th century New York. Obviously, these comparisons are only for orientation. To situate New York City more firmly within a web of trans-Atlantic comparisons, better and broader data are needed, while differences in urban and rural diets also have to be accounted for.

Overall, it is safe to conclude that New Yorkers, from the mid-1790s until the late 1810s, ate remarkably well for their own time, as well as in comparison to later periods. They ate about as much meat as did better off urban Americans in 1909, and only a little less—if at all—than the average urban American in the record year of 1965. More precisely, they consumed about 14%
more beef than the average American in 1909, and about 11% less than the average American in 1965. The data also complement McMahon’s claim of progressively rising meat consumption levels from the 18th through the early 19th century. Compared to McMahon’s estimate of a 10% increase from the Revolutionary period to the early 19th century, the market fees suggest a more robust 19% increase between 1790 and the period between 1795 and 1818.45 The remarkable stability of the consumption rates between 1795 and 1816 provides strong evidence that after the Revolution, meat consumption gradually reached a very high equilibrium. Moreover, the data show that urban meat consumption levels, at least in the case of New York, were considerably higher than rural averages. In short, New Yorkers not only had the privilege of eating fresh meat, in particular beef, all year around, they also ate more of it than their rural counterparts who fed them.

This was no small feat, considering that over the three decades between 1790 and 1820, the city’s population nearly quadrupled from slightly below 33,000 to a little over 120,000 inhabitants. Besides, these were turbulent times, with frequent outbreaks of yellow fever, economic setbacks, and a devastating war. It would be mistaken to assume that in so far as there was a sufficient supply of meat reaching the city, residents were by definition well-fed. Most importantly, the Common Council committed the necessary resources to maintain and expand the market-system.46 New markets were opened in new areas even as the city pushed incessantly northward. From the one-market model of the 1790s, by the early 1810s gradually emerged a spatially well-allocated market system of three dominant markets in the center complemented by small area markets in urbanizing northern wards (see maps 1-4).47 The spatial expansion of the system guaranteed that residents walked more or less the same manageable distances for their provisioning journeys over the three decades. Besides opening new markets in undersupplied areas, the Council also added more stalls at existing locations to meet growing demand. As a result, the scale and relative volume of trade of the individual markets closely mirrored the city’s shifting population densities.48

The expansion of the market system refers to this dual process of building new markets in new areas, and adjusting the scale of existing markets according to changing demand. Figure 4 charts the number of available and occupied butcher stalls for each year between 1790 and 1820, while figure 5 calculates how many residents there were for each available stall in the city during this period.49 Of course, there needs not to be a one-to-one relationship between the number of
Maps 1-4: Expansion of the market system, 1792-1816
stalls and how many customers they could supply. It is feasible that a butcher could expand his sales to many more customers. However, three structural obstacles limited the scale of the retail butcher’s trade. First and foremost, the distances New Yorkers were willing to walk on a daily basis confined the pool of customers for any butcher. Second, lacking proper refrigeration, a butcher could cut up only about as much meat as he expected to sell at any given day. And even if he could overcome some of these constraints by hiring more apprentices, the relatively small—and prescribed—size of his stall posed further limitations on how much meat could be handled.

In so far as the retail butcher’s trade remained largely unchanged, there was an upper bound to how many customers he could supply, and hence increasing demand had to be met by adding new stalls to the system, and by licensing more butchers.

![Figure 4: Nr. of butcher stalls (1790-1820)](image)

![Figure 5: Nr. of residents per butcher stall (1790-1820)](image)

Figures 4 and 5 confirm this interpretation. It is revealing how, as shown by figure 4, the market system expanded only at a slightly lower rate than did the city’s population. Between 1790 and 1800, the population grew at an annual rate of 6.2% from 33,131 to 60,515, while the number of butcher stalls increased from 75 to 131, also by 6.2% per annum. By 1810, the number of New Yorkers reached 96,373, representing an annual rate of growth of 4.8%. During the same period, the number of stalls increased to 186—at a slightly lower rate by 3.3% annually. Because of the war of 1812, the city’s population stagnated until 1816, and then it
grew rapidly to reach 123,706 by the end of the decade. Corresponding to this lower rate of population growth at 2.6% per annum, the market system also expanded more slowly, by 2% annually, to reach 223 stalls.

The number of residents per stall (figure 5) increased, albeit very little. Whereas in the 1790s, there were on average 433 residents for each stall, during the first decade of the 19th century, this ratio increased to 488, and to 498 for the 1810s. In other words, despite growing demand, the average butcher in the 1810s retailed meat to a clientele only about 15% larger than his predecessor two decades earlier. Greater demand was not met by more efficient retail practices, but by more butchers entering the trade, which, given the market laws, depended on the city’s commitment to adding new markets and stalls to the municipal infrastructure. One should add that in addition to market butchers, the City Council also licensed on a case-by-case basis a few butchers to retail from street stalls in areas undersupplied by markets. The exact number of these butchers is unknown, but remained probably very low. If those butchers were also included, the increase in the ratio of residents per stall would be even smaller.

All in all, New Yorkers were well-fed with meat only in part because the city could rely on sufficiently expanding supplies. This was a necessary, but not a sufficient condition. It also mattered that the Common Council maintained and expanded the market-system at a sufficient rate to ensure the proper distribution of meat to residents. If New Yorkers were as well-supplied with meat as the data suggest, despite having lived through a turbulent time with numerous external shocks and a remarkable rate of population growth, which made their city the largest of the Americas, this should be regarded as a remarkable success.

(2) Quantity of the Meat Supply, 1821-1860

Moving to the second quarter of the 19th century, the data are far more limited to arrive at reliable estimates concerning Gotham’s meat supplies. This is most unfortunate, given that much of the Antebellum puzzle focuses on this period, when a notable decrease in adult male body height—for birth cohorts between 1830 and 1860—indicates falling rates of per capita protein consumption. Haines’ New York State census figures date the beginning of the decline in per capita meat production before 1835, while the national census used by Komlos picks up on this already unfolding process from 1839. It is probable that New Yorkers experienced a similar negative trend during the second quarter of the 19th century just like the rest of their state.
or the nation. In what follows, I will present a range of indirect evidence to make suggestive claims about changes in per capita meat consumption in New York City after 1820, compared to the very high equilibrium documented for the period between 1795 and 1818.

The main problem is that after 1820, the Council no longer collected market fees based on the amount of butcher’s meats sold, but instead collected annual rents for market stalls on a weekly basis from the city’s butchers, and daily fees from all other vendors—fishermen, farmers and hucksters—for standing at the markets. In other words, the city’s market revenues after 1820 do not directly reflect meat consumption levels. Fortunately, the market laws, which limited the sale of fresh meat to the city’s public markets, ensured that officials had access to some information concerning the city’s meat supply. I have found data about the number of beef cattle slaughtered in the city for 1831, from between 1836 and 1838, and for 1842.\textsuperscript{51} In addition, for the period between 1832 and 1835, the Market Committee noted that “the number of beef cattle slaughtered in the city went on gradually and regularly increasing,” allowing to make further estimates. As for 1842, the City Comptroller arrived at a rounded figure based on the “best data” he was able to collect. To what extent these figures are reliable is difficult to judge. One concern is that New York did not build public abattoirs like Paris, nor had access to a single livestock market and slaughterhouse like Brighton Market, which served Boston.\textsuperscript{52} Instead, butchers killed and processed animals in hundreds of private slaughterhouses across the city. To better assess the reliability of the New York data, table 6 compare these sporadic figures to the more consistent observations from Boston’s Brighton Market.\textsuperscript{53}

As Brighton Market did not exclusively supply meat for Boston, but also served the city’s greater region, per capita figures for Boston were easily three times higher than for New York. The point of using the Brighton Market data is not to compare absolute consumption rates, but rather to trace trends over time. As table 6 shows, the two series follow a similar course over the 1830s: the number of beef cattle slaughtered gradually increased during the first half of the decade, decreased notably during the second half, to recover by the beginning of the 1840s. There are two notable differences in the series. Whereas the New York data show consistent growth until 1836, a sharp drop in 1834 interrupted the rising trend in Boston. It is also true that for between 1832 and 1835, the New York figures are my own estimates based on the Market Committee’s note that the city’s beef supply increased gradually and regularly. Another discrepancy is that the decline began one year earlier for Boston than New York.
Table 4:
Beef cattle slaughtered in New York City and Boston, 1831-1850

<table>
<thead>
<tr>
<th>Year</th>
<th>Beef, nr. (NYC) Total</th>
<th>Beef, lbs (NYC) Per capita</th>
<th>Beef, nr. (Boston) Total</th>
<th>Beef, lbs (Boston) Per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>1831</td>
<td>27,554</td>
<td>57.8</td>
<td>33,922</td>
<td>240.9</td>
</tr>
<tr>
<td>1832</td>
<td>32,949*</td>
<td>65.2</td>
<td>40,807</td>
<td>280.7</td>
</tr>
<tr>
<td>1833</td>
<td>38,344*</td>
<td>71.7</td>
<td>49,180</td>
<td>327.7</td>
</tr>
<tr>
<td>1834</td>
<td>43,739*</td>
<td>77.2</td>
<td>36,382</td>
<td>234.8</td>
</tr>
<tr>
<td>1835</td>
<td>49,134*</td>
<td>81.9</td>
<td>51,096</td>
<td>319.4</td>
</tr>
<tr>
<td>1836</td>
<td>54,531</td>
<td>88.2</td>
<td>38,504</td>
<td>233.2</td>
</tr>
<tr>
<td>1837</td>
<td>44,495</td>
<td>69.9</td>
<td>32,644</td>
<td>191.5</td>
</tr>
<tr>
<td>1838</td>
<td>40,877</td>
<td>62.4</td>
<td>25,830</td>
<td>146.8</td>
</tr>
<tr>
<td>1839</td>
<td></td>
<td></td>
<td>23,624</td>
<td>130.0</td>
</tr>
<tr>
<td>1840</td>
<td></td>
<td></td>
<td>34,160</td>
<td>182.1</td>
</tr>
<tr>
<td>1841</td>
<td></td>
<td></td>
<td>36,607</td>
<td>182.2</td>
</tr>
<tr>
<td>1842</td>
<td>52,000</td>
<td>69.9</td>
<td>32,970</td>
<td>153.9</td>
</tr>
<tr>
<td>1843</td>
<td></td>
<td></td>
<td>37,340</td>
<td>164.1</td>
</tr>
<tr>
<td>1844</td>
<td></td>
<td></td>
<td>37,610</td>
<td>156.2</td>
</tr>
<tr>
<td>1845</td>
<td></td>
<td></td>
<td>48,910</td>
<td>192.4</td>
</tr>
<tr>
<td>1846</td>
<td></td>
<td></td>
<td>38,670</td>
<td>146.8</td>
</tr>
<tr>
<td>1847</td>
<td></td>
<td></td>
<td>43,425</td>
<td>159.0</td>
</tr>
<tr>
<td>1848</td>
<td></td>
<td></td>
<td>40,784</td>
<td>144.1</td>
</tr>
<tr>
<td>1849</td>
<td></td>
<td></td>
<td>46,465</td>
<td>158.3</td>
</tr>
<tr>
<td>1850</td>
<td></td>
<td></td>
<td>42,830</td>
<td>140.8</td>
</tr>
</tbody>
</table>

How to explain these trends? One possibility is that the decline in urban beef consumption during the second half of the 1830s was the result of worsening supply conditions. Indeed, Haines’s production figures obtained from the New York State censuses testify to the diminishing supply of beef cattle between 1835 and 1840. At the same time, it was probably no accident that the sharp decline in urban beef consumption coincided with the recession of 1837/43.\(^{54}\) The recession most likely required households in New York and Boston—and probably in cities across the country—to cut back on their purchases of meat. Komlos in fact did suspect such a relationship. He suggested that “the decline in heights of the second half of the 1830s may very well have been caused, or at least exacerbated, by the recession of 1837.”\(^{55}\) He did not have the data to demonstrate how falling incomes manifested in lower protein consumption, which in turn could have contributed to the broadly observed trend of declining physical stature. Yet the data from New York and Boston do suggest that the economic crisis played a role in contributing to a negative cycle in urban meat consumption levels.

There are two concerns with the data. First, if the decline was related to the panic of 1837, it is puzzling to see that the process began one year earlier in Boston. If so, the recession is to blame for exacerbating this declining trend. Second, when looking at actual per capita beef
consumption in New York, the figures between 1836 and 1842 match earlier estimates that put per capita beef consumption at 92.8 pounds between 1795 and 1816. In comparison, the figure of 88.2 pounds in 1836, followed by a drop to 69.9 pounds in 1837 at the beginning of the recession, a further decline to 62.4 pounds by the following year, and a mild recovery to 69.9 pounds by 1842, seems like a reasonable unfolding of the recessionary cycle. Yet the figures for the earlier years are difficult to interpret. They testify to “gradually and regularly” rising per capita beef consumption from as low as 57.8 to 88.2 pounds between 1831 and 1836. When comparing the New York and Boston data, one observes similarly rising trends, except for the drop in 1834 for Boston. But the New York figures are unrealistically low, raising serious doubts about the reliability of the data. Further research should incorporate similar observations from comparable cities to substantiate these trends.

In any case, the evidence suggests that the recession of 1837/43 played some part in the negative cycle in urban meat consumption. As concerns the Antebellum puzzle, the next question is whether or not the recessionary cycle, which was followed by a period of recovery in the middle of the decade, was complemented by a similar recovery or a lower equilibrium in urban meat consumption. Looking back at table 4, the Boston data point to the second outcome. Similarly, Haines’s New York State census figures indicate a brief recovery in the supply of beef between 1840 and 1845, followed by a consistently declining trend from 1845 until the end of the Civil War. Komlos’s estimates based on the national censuses also suggest a progressively declining rate of per capita meat consumption from 1839 until the 1870s. While there is no direct evidence available, it is reasonable to suggest that New York City should have not behaved much differently from Boston, or the rest of New York State, or the nation.

An alternative approach is to look at prices. The most widely used price index for the period comes from Philadelphia, but there are similar data available for New York City and Boston as well. Figure 6 compares the relative wholesale price of beef in New York, Philadelphia and Boston between 1820 and 1860, while figure 7 presents the relative wholesale price of pork in New York and Philadelphia, and the Philadelphia price index for “meats and meat products” as computed by Bezanson, et al. Price quotations refer to barreled beef and pork, but it is unlikely that the price of fresh meat would have followed different trends. The figures show that between 1820 and 1860 the wholesale prices of beef and pork moved very closely together across the cities. This is no surprise, after all the price of meat largely depended
on supply conditions, and the three cities are all located in the Northeast. The strong correlations between the prices of beef and pork make it safe to assume that the index for all “meats and meat products,” available only for Philadelphia, reflects trends in New York and Boston as well.

The rising price of meat from the mid-1830s, but especially between 1836 and 1839 makes the case for a decline in supply. The recession of 1837/43 did not set off the negative trend in meat consumption—at least in so far as demand was concerned. This interpretation is confirmed by the Market Committee, who when addressing in December of 1839 the causes of the “late high prices of beef,” refuted widespread claims that the city’s restrictive trade in fresh meat was at fault, and pointed to the “the scarcity of the supply” as the main reason.61 Beginning in 1840, however, meat prices fell sharply and consistently to reach their bottom by the middle of the decade. By this later stage the recession cut deeply into urban households’ living standards, pushing demand for meat to unprecedented lows. Later in the 1840s, meat prices climbed back
to pre-recessionary levels, while over the first half of the 1850s, they continued to increase, which again suggest declining supply. One brief interruption to this steady rise in meat prices occurred from around 1848 through the early 1850s, coinciding with the recession of 1848/55. Overall, the wholesale price indexes from New York and Philadelphia complement the earlier evidence of the Brighton Market data to suggest that following the recession, urban meat consumption did not fully recover, but shifted to a lower equilibrium. They also indicate that this declining trend from the mid-1830s was driven chiefly by worsening supply conditions, which was further exacerbated by the two recessions. How exactly supply conditions changed, requires additional research.

At the other end of the urban food system, operated Gotham’s infrastructure of provisioning. It makes sense to compare the above observations about the city’s meat supply to more systematic data concerning the public market system. As earlier noted, after 1821, the city collected annual rents for stalls from licensed butchers, and daily fees from all other vendors, including fishermen, farmers, and hucksters. Butcher rents were fixed by the Market Committee according to the rental value associated with the stalls. In addition, starting in 1821, but especially between 1830 and 1835, the Council charged premiums for market stalls that opened up for occupancy through a competitive bidding process. The point is that only in this indirect way did rents or premiums reflect changes in the volume of meat trade. Market fees, on the other hand, corresponded to the number of vendors, and thus convey more directly the volume of market trade. While neither rents nor fees can be used to estimate how much meat or other fresh foodstuff was sold through the market system, the revenue data do reveal the changing fortunes of the city’s market vendors.

Figure 8 compares the city’s population size to its market rents and fees between 1823 and 1849 that is the period of transition in New York’s provisioning system, and the time of shift from higher to lower meat consumption levels. I begin the analysis in 1823, as it took some time until the new revenue system became firmly established. In the 1820s, both market rents and fees increased at about the same rate as did the population, suggesting that the city’s food supply more or less kept up with urban growth. The first notable change occurred in the early 1830s, especially in 1832, when market fees suddenly fell by 16.8% compared to the previous year. This drastic decline was the result of the first major cholera epidemic that hit New York in 1832, killing 3,513 people, or 1.5% of the city’s residents. Like yellow fever before, in the
second quarter of the century, cholera presented a major external shock, creating a negative feedback in food consumption. It is also true, that the much milder 1834 cholera epidemic only corresponded to stagnating market fees, while the more severe 1849 epidemic, which claimed the lives of 1.1% of the residents, resulted in a relatively small decrease of fees. Yet by then, markets also played lesser role in provisioning residents. The data reveal that from the 1830s, market fees lagged behind population growth, underlining how during the second quarter of the 19th century, an increasing portion of the public markets’ business migrated to private stores.

Looking at butcher rents complements this picture. Market rents grew gradually and progressively between 1823 and 1834. Then, between 1835 and 1842, their amount drastically dropped—the unique increase in 1838, in the middle of the recession, probably reflects the Council’s more forceful efforts in this year to collect regular and late rents. In 1843, rents recovered from their bottom, but only to stagnate for the rest of the decade. Even if rents do not directly reflect the volume of meat trade, they certainly convey how good a business a market butcher conducted. If so, the data point to three conclusions. First, they confirm the earlier point that urban meat consumption was already declining by the mid-1830s. The recession of 1837/43 exacerbated this trend by causing a major drop in demand. Second, the fact that by 1835 butchers saw their businesses decline suggests that widespread complaints about growing violations of the market laws were well-founded. From around the late 1820s and early 1830s, butchers faced fierce competition from informal vendors operating outside of the market system. And finally, the fact that after a recovery in 1843 rents stagnated for the rest of the decade demonstrates how markets lost their dominant role in provisioning fresh meat to New Yorkers. Most of the expansion in the meat retail business by then occurred at private butcher shops.
Figures 9 and 10 support this analysis. The number of both available and occupied butcher stalls increased steadily between 1821 and 1842, even if at a lower rate than did the city’s population, which is reflected in the growing number of residents per stall from 576 in 1821 to 848 in 1842. This was, no doubt, a significant increase, which was partly offset by the licensing of butcher shops in the city’s northern fringes, as well as the ever more widespread practice of retailing fresh meat informally. In addition, butchers began to use refrigerator boxes from the mid-1830s, which helped improving the efficiency and scale of their operations. At any rate, the hasty growth in the number of residents per market stall after 1842 from 848 to 1,440 by 1850 exhibits the decline of the municipal market system, and the complementary expansion of the business of private butcher shops. By 1845 no less than 410 official meat shops operated in the city, and their numbers increased to 531 by 1850. This trend is further substantiated by the growing difference between the number of available and occupied market stalls. From the late 1830s more and more butchers abandoned the markets, or did not apply for stalls that opened up for occupancy—a testimony not only to the fading importance of public markets, but also that the recession of 1837/43 contributed to declining meat sales.

Maps 5-12 substantiate this interpretation. The spatial analysis reveals how the development of the public market system from the late 1820s gradually fell behind urban growth.
The GIS maps highlight that the relative volume of trade of the individual public markets—
measured in terms of their number of butcher stalls, overall butcher rents and overall market
fees—corresponded less and less to the distribution of the city’s population. As a result, by the
late 1830s the city’s public market infrastructure became spatially increasingly misallocated.71
As table 5 highlights, whereas in 1818 there was a strong correlation between the relative volume
of trade of the individual markets and ward level population densities, through the 1830s and
1840s this spatial correlation gradually declined to reach null by the 1850s.

Table 5:
Spatial correlations: hierarchy of markets & ward-level population densities, 1818-1855

<table>
<thead>
<tr>
<th>Year</th>
<th>Market revenues</th>
<th>Butcher stalls</th>
<th>Butcher rents</th>
<th>Average butcher rents</th>
<th>Market fees</th>
<th>Average R-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>1818</td>
<td>0.724</td>
<td>0.725</td>
<td></td>
<td></td>
<td></td>
<td>0.725</td>
</tr>
<tr>
<td>1822</td>
<td>0.704</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.704</td>
</tr>
<tr>
<td>1828</td>
<td>0.543</td>
<td>0.536</td>
<td>0.616</td>
<td>0.566</td>
<td>0.565</td>
<td>0.565</td>
</tr>
<tr>
<td>1835</td>
<td>0.539</td>
<td>0.424</td>
<td>0.274</td>
<td>0.365</td>
<td>0.400</td>
<td>0.400</td>
</tr>
<tr>
<td>1840</td>
<td>0.555</td>
<td>0.520</td>
<td>0.147</td>
<td>0.299</td>
<td>0.380</td>
<td>0.380</td>
</tr>
<tr>
<td>1845</td>
<td>0.679</td>
<td>0.422</td>
<td>0.031</td>
<td>0.253</td>
<td>0.346</td>
<td>0.346</td>
</tr>
<tr>
<td>1850</td>
<td>0.518</td>
<td>0.239</td>
<td>-0.096</td>
<td>0.016</td>
<td>0.169</td>
<td>0.169</td>
</tr>
<tr>
<td>1855</td>
<td>0.244</td>
<td>0.086</td>
<td>-0.127</td>
<td>-0.079</td>
<td>0.031</td>
<td></td>
</tr>
</tbody>
</table>

It is time to draw some conclusions based on the wide range of evidence presented
concerning New York City’s meat supply between 1790 and 1860. First, the market returns and
market fee data offer robust evidence that New Yorkers were well supplied with meat between
1790 and 1818. By the 1790s, per capita meat consumption in New York City reached levels
that compares favorably to the highest recorded rates in America during the 20th century. If, as
the demographic literature posits, a decline occurred over the second and third quarters of the
19th century, it represented a negative trend compared to this high equilibrium. Second, the data
underline that urban meat consumption had a few distinctive qualities. American city dwellers
ate first and foremost fresh meat, and beef in particular, which set them apart from their rural
counterparts. They also seem to have eaten more meat than those living in the countryside. At
the same time, the urban supply of food was very sensitive to external shocks. The 1798 yellow
fever and the 1832 cholera epidemic resulted in dramatic collapses in meat consumption levels.
Sorting out cause and effect in these instances seems a hopeless exercise. Food consumption
may have dropped as thousands escaped the city, while an epidemic could also have disrupted
the normal functioning of the provisioning infrastructure, or caused severe interruptions in the
city’s supply chains. It is likely that at times of epidemics, cattle drovers or farmers also stayed
Maps 5-8: Expansion of the market system, 1818-1835
away. Historians have appreciated the precariousness of urban life in the face of disease before the 20th century. Yet understanding how the toll of epidemics was exacerbated by interruptions in the city’s provisioning system deserves more attention. Besides disease, city dwellers also disproportionately suffered at times of political crises. The embargo of 1807, and especially the war of 1812, caused major setbacks in the supply of meat and other provisions. City dwellers, who did not grow their own food but relied on supplies from the hinterlands, must have felt these hardships more than rural residents.

Third, the data leave little space for doubt that the most consequential external shock for urban food consumption during the Antebellum period was the recession of 1837/43. Komlos posited a link between the recession and declining physical stature, assuming that as real wages fell, so did households reduced their expenditures on meat. The data bear out this relationship for New York City, New York State and Boston. The evidence is strong that even though urban meat consumption began to decline prior to the recession, indicating worsening supply conditions, this negative trend was considerably exacerbated by the recession of 1837/43. This leads to the fourth problem. Did per capita meat consumption in New York City recover to the earlier high equilibrium, or settle at lower rates following the recession? While I have not been able to find direct documentation for either case, all indirect evidence points to the second outcome. Consumption figures for Boston suggest a lower equilibrium, while production data from New York State and the federal censuses indicate a decline in the supply of beef until well past the Civil War. Wholesale prices from New York City, Philadelphia and Boston corroborate this. Even if after the recession meat prices temporally fell, from the late 1840s through the 1850s, they rose sharply again. On the whole, it seems safe to suggest that New Yorkers ate less meat from around the mid-1830s, and especially after the recession of 1837/43 until past the Civil War than between 1790 and 1818. How much less exactly that was, remains an open question.

Finally, data on annual stall counts complemented by GIS maps revealed that from around the late 1820s, the expansion of the municipal market system lagged behind urban growth. Even more importantly, the market infrastructure also became less responsive to the city’s constantly shifting population densities. The market revenue data, in turn, corroborated that during the second quarter of the 19th century, an ever larger portion of fresh food retailing shifted from the city’s public markets to the private stores. Additionally, residents turned to an
expanding informal economy of food retailing at homes, in stores, or on the streets. This is to stress that the deregulation of meat retailing in 1843, in part, was the legalization of this already existing economy.\textsuperscript{72}

\textbf{(3) Quality of the Meat Supply}

This last point leads to the broader issue of the quality of the meat supply. The literature is more hesitant to address this problem, probably because quality is a more elusive category that defies any systematic way of measuring change over time. Komlos and Haines pointed out that as urbanization required food to be transported across larger distances, while commercialization progressively separated the producer from the consumer, the quality of fresh food most likely declined.\textsuperscript{73} Yet in so far as quantitative data are lacking to substantiate these claims, a closer look at the local level offers an alternative approach. In the case of New York, the specific problem to address is how the shift from a public market system of provisioning to a free-market model of private stores affected the quality of the meat consumed.

The Common Council’s Market Committee was undeniably in favor of the market system. Despite this bias, its position on the subject is worth considering. In response to widespread complaints about the market monopoly of meat by some, or its violations by others, the Committee produced its report on December 2, 1839.\textsuperscript{74} Besides making the point that the recent high prices of beef were not the fault of the market laws, but of falling supply, the Committee exposed the underlying principles of the market laws, and how those promoted the “public good.” The core of their argument was public health. It is worth citing the entire passage, before examining its key points.

The various and important duties which are now performed by the Superintendents and the Deputy Clerks of the Markets, in guarding the public health, by examining as to the wholesomeness of provisions; whether stale, or blown, plaited, raised or stuffed, measly or affected by disease; and whether proper cleanliness is observed; and as to other important Police regulations, as to weights, measures, &c., if the business of vending meats, &c., is not confined to the Public Markets, become entire vain and nugatory.

It has been proved, to the satisfaction of your Committee, that in several instances the carcasses of animals which have died, either from disease or some natural cause, have been cut up and offered for sale at some of the shops. Such a case could not occur at a Public Market. Skilful butchers could instantly detect the fact, and the person offering such meat would be immediately expelled from the Market, as was done only a short time since. The health of our city is a matter of the highest consideration; and the cleanliness,
upon which it mainly depends, and which now characterizes our Public Markets, cannot possibly be preserved, if the business of dealing in all kinds of meats be diffused throughout the city.

The best Police regulations, which could be enacted, would be useless, because they could not be carried into effect.

The Market Committee thus portrayed the municipal system of provisioning as a central pillar of the City’s efforts to promote public health. This was a common line of reasoning, which the city’s butchers borrowed profusely. In their petition of February 5 of 1840, for example, they accused the opponents of the market laws with trying “to break down every barrier, and destroy every guard that the law has erected for the preservation of peace, health and morality.” Even the Council’s more sober Select Committee that was charged to assess the Market Committee’s oft-cited report, asserted this point in its own analysis of March 2 of 1840. “It is unnecessary to enter into a full discussion of the effect of unregulated pursuit of the business of butchers upon the public health and conveniences.” Only if police regulations are fully carried out—“slaughter houses be removed entirely out of the populated parts of the city”, and “all meats offered for sale undergo a proper supervision, as in other large cities in Europe”—, they continued, could the market laws be abolished without harmful consequences for public health.76

No such cautionary measures were taken. In fact, the ordinance that abolished the market laws, drafted in October of 1842, and signed into law in January 20 of 1843, simply extended the same sanitary regulations to shop butchers that applied to market butchers. It even entrusted the same authorities to enforce those, including the Superintendent of Markets, the Alderman, Assistant Alderman, Street Inspector, and Health Warden of each ward.77 Responding to the ordinance, the butchers tried again in November 28 of 1842. They cited a medical report by Drs. M. Post, Hosack, and Chilton, which, they claimed, offered “irresistible and conclusive proof of the absolute necessity of protecting our citizens against the fatal results consequent upon the sale and consumption, as an article of food, of the flesh of diseased animals—a fraud so easily detected under the present system of the Public Markets.”78 The butchers were not talking out of thin air, but in fact referred to a recent incidence of meat poisoning. After thorough medical examination, the experts cited by the butchers asserted that the source of the disease, affecting a family of seven, all of whom showed alarming symptoms of food poisoning, was a neighborhood grocer retailing smoked beef.79 It is also true, that their recommendations was not to sustain the
market laws, but to establish large-scale public abattoirs in the Parisian model, to ensure the regular and thorough inspection of the city’s meat supply.\textsuperscript{80}

That public debates about the market laws were articulated in the discourse of public health should be no surprise. By the late 1830s and 1840s, the sanitary movement gained enough ground to push public health into the forefront of a wide range of urban reforms.\textsuperscript{81} But did market laws reflect the same awareness throughout the period?\textsuperscript{82} Strict limitations of market hours, or restrictions on the sales of specific items—such as gut fat or sheep head—at certain times of the year, were chiefly motivated by public health concerns. But this was a small part of the story. Market laws instituted high penalties for selling unwholesome provisions, and charged the Clerks, Deputy Clerks, and later Superintendent of Markets to inspect and enforce quality. Market officials also monitored the accuracy of measures and weights, and were responsible for collecting all revenues and penalties. To be effective, they kept a close eye on the lawful occupancy of market space, including stalls and other vending spaces, the market limits, and the neighboring streets. They regularly prepared lists of vendors with their locations, issued or denied permits to countrymen or countrywomen, and in cases of violations of the market laws, with an accompanying report, they had the right to suspend a butcher’s license. In addition, they oversaw the general cleanliness of public markets, employed sweepers for this purpose, and required butchers to keep their stalls clean. In short, market officials, especially the Deputy Clerks, who attended their respective markets daily, were granted extensive authority to uphold socially perceived norms of public health. The historical literature confirms that public markets were one of the few, if not the only, infrastructures by which American cities maintained some control over the quality of their fresh food supplies in this period.\textsuperscript{83}

Municipal governance, or more precisely, market officials and ordinances were one source of quality control. The internal organization of the marketplace was the other. One way to think about a public market is that it is one good example of an agglomeration economy derived from shopping externalities.\textsuperscript{84} Even if the market itself, from building to stall, was municipal property, market trade remained the domain of free enterprise. By concentrating the sale of all fresh food items into one location, the market functioned much like a supermarket. But whereas the supermarket is owned by one firm, the municipal market agglomerated hundreds of independent retailers, encouraging competition between vendors. In so far as competition promotes lower prices, greater selection or better quality of goods, the market provided a balance
of competitive business practice and municipal oversight. Besides, until 1843, the market laws restricted the sale of fresh meat—an immensely important part of an average New Yorker’s diet—into a few locations within walking distance for most residents. As provisioning was a frequent household responsibility, it made sense for shoppers to take care of most purchases over one trip. In other words, the market laws artificially amplified the agglomeration of fresh food into the city’s markets. Customers were forced to frequent marketplaces. Yet at the market, they not only could purchase all fresh provisions, but also were able to compare prices and quality across the retailers of the same goods.

If the first line of defense was the city government, and the second consumer choice, the third important mechanism of quality control was peer-pressure. Market vendors monitored each other to prohibit the violations of basic market principles. A butcher selling unwholesome provisions would have faced sanctions from fellow butchers. Endless petitions by licensed butchers complained how “shirk butchers,” selling meat in small pieces at the country market, violated market laws.85 The market law itself institutionalized peer-pressure. If a Deputy Clerk suspected that a butcher sold unwholesome meat, he called on the authority of “any two butchers whom he may select for that purpose… (the said butchers being under oath) to determine whether such article or provision sold or offered for sale as aforesaid, is stale or unwholesome, or whether such meat is blown or stuffed, or whether such pork is measly, and their judgment shall be final and conclusive.”86 Besides protecting oneself from unfair competition, all vendors had a vested interest in upholding the reputation of their marketplace. But more than any other vendors, butchers, who invested capital into their stalls, by which they retailed meat every day, were identified by customers not only by the price, selection or quality of their cuts, but also by the general character of their marketplace.

This leads to the fourth line of defense, which has to do with the butcher’s trade. Despite fundamental changes in the structure of work during the first half of the 19th century, butchers remained one of New York’s last traditional urban trading craft, which status they vehemently defended.87 Market butchers may have exploited the discourse of public health to defend their privilege of retailing fresh meat. Yet the butchers’ trade indeed had special qualities. Above all, butchers had to complete six, later four years of apprenticeship, before they could even apply for a stall at one of the city’s markets. Obtaining a stall depended on availability and one's reputation. When a young butcher applied, he had to submit a formal petition to the Council,
which was customarily endorsed by fellow butchers and/or residents, who testified to the sound business practices and flawless moral character of the novice. Butchers also acted as a corporate entity, and exhibited their collective identity at public events such as the city’s parades.\textsuperscript{88} Above all, their opposition to reform the market laws was distinguished by its high level of organization. Even if young apprentices were known to be a rowdy crowd—affiliated with street gangs, nativism, and in general, with an excessive culture of masculinity—, from the point of view of the quality of the meat supply, market butchers were craftsmen, skilled in the business of slaughtering, preparing, and retailing fresh meat.\textsuperscript{89}

The butcher-turned-historian and later Market Superintendent Thomas F. De Voe was undoubtedly an unusually erudite butcher. Still, De Voe’s \textit{The Market Book} and \textit{The Market Assistant} were testimonies not only of his mastery of an old tradition of craftsmanship, but also of the public purpose and collective identity of generations of butchers.\textsuperscript{90} \textit{The Market Book} contains long biographies of New York’s more reputable butchers as if their public role competed with that of the city’s officeholders. When looking at De Voe’s original manuscripts, it is clear, that more than half of his work consisted of meticulously documenting the long heritage that inseparably tied the butchers to their city. \textit{The Market Assistant}, describing each and every food item, was supposed to assist fellow residents about how to navigate the city’s landscape of marketing. Yet the attention De Voe gives to the butcher’s craft—the preparation and handling of fresh meat, the various kinds of cuts and their qualities—is truly remarkable. Every page of the book is evidence of a sophisticated artisan, who knew everything there was to know about the trade of retailing fresh meat.

Finally, a fifth mechanism of quality control derived from the ongoing relationship between vendor and customer. Repeated transactions emerged out of two distinct conditions of urban marketing. Due to limitations of refrigeration technologies, households had to frequent the local marketplace multiple times a week. The other component was that the butcher’s trade was spatially stable. Beginning in 1821, butchers rent stalls from the Council for annual rents. In addition, until 1835 stalls that opened up for occupancy were auctioned out for premiums. Even as the stall remained municipal property, a butcher had exclusive rights over this piece of market space. The point is that the stall represented the butcher’s single most important capital investment. As stalls were in limited supply, once a butcher obtained a good location for his business, he would hold onto this possession. The market system thus not only restricted the
retailing of fresh meat into a dozen or so places in the city, but also locked in butchers to specific slices of market space for at least as long as they were able to exchange their stalls to another one. As myriads of petitions testify, some butchers found ways around the system. A butcher could manipulate the market for stalls by recommending a successor to the Council, or by exchanging his stall for another with the consent of another butcher and the Council, or by informally subleasing it. Still, such practices could only have marginal impact on a real estate market that was largely controlled by the municipality, and which created artificial barriers for butchers to relocate their businesses.

Table 6:
Number of butchers at same market between 1818/1828, 1828/1838 and 1818/1838

<table>
<thead>
<tr>
<th></th>
<th>1818/28</th>
<th>1828/38</th>
<th>1818/38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catharine</td>
<td>15 (47)</td>
<td>15 (47)</td>
<td>7 (47)</td>
</tr>
<tr>
<td>Centre</td>
<td>8 (14)</td>
<td>9 (20)</td>
<td>3 (14)</td>
</tr>
<tr>
<td>Franklin</td>
<td>NA</td>
<td>4 (8)</td>
<td>NA</td>
</tr>
<tr>
<td>Fulton</td>
<td>NA</td>
<td>30 (60)</td>
<td>NA</td>
</tr>
<tr>
<td>Washington</td>
<td>20 (55)</td>
<td>22 (55)</td>
<td>8 (55)</td>
</tr>
<tr>
<td>Clinton (1829/1838)</td>
<td>NA</td>
<td>11 (24)</td>
<td>NA</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td>42%</td>
</tr>
</tbody>
</table>

Table 7:
Number of times butcher stalls changed occupancy between 1832/1836

<table>
<thead>
<tr>
<th></th>
<th>&quot;0&quot;</th>
<th>&quot;1&quot;</th>
<th>&quot;2&quot;</th>
<th>&quot;3&quot;</th>
<th>Stalls</th>
<th>Change</th>
<th>Family</th>
<th>Market</th>
<th>Ave. years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catharine</td>
<td>26 (55%)</td>
<td>12 (26%)</td>
<td>7 (15%)</td>
<td>2 (4%)</td>
<td>47</td>
<td>32</td>
<td>4</td>
<td>1</td>
<td>3.0</td>
</tr>
<tr>
<td>Centre</td>
<td>13 (54%)</td>
<td>10 (42%)</td>
<td>4 (4%)</td>
<td>0</td>
<td>24</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>3.3</td>
</tr>
<tr>
<td>Essex</td>
<td>10 (56%)</td>
<td>6 (33%)</td>
<td>0</td>
<td>2 (11%)</td>
<td>18</td>
<td>12</td>
<td>1</td>
<td>0</td>
<td>3.0</td>
</tr>
<tr>
<td>Franklin</td>
<td>6 (75%)</td>
<td>0</td>
<td>2 (25%)</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Fulton</td>
<td>35 (58%)</td>
<td>18 (30%)</td>
<td>5 (8%)</td>
<td>2 (3%)</td>
<td>60</td>
<td>34</td>
<td>4</td>
<td>4</td>
<td>3.2</td>
</tr>
<tr>
<td>Grand</td>
<td>5 (50%)</td>
<td>0</td>
<td>2 (20%)</td>
<td>3 (30%)</td>
<td>10</td>
<td>13</td>
<td>0</td>
<td>3</td>
<td>2.2</td>
</tr>
<tr>
<td>Washington</td>
<td>32 (58%)</td>
<td>17 (31%)</td>
<td>4 (7%)</td>
<td>2 (4%)</td>
<td>55</td>
<td>31</td>
<td>3</td>
<td>1</td>
<td>3.2</td>
</tr>
<tr>
<td>Average</td>
<td>58%</td>
<td>23%</td>
<td>11%</td>
<td>7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 6 studies the long-term stability of the market butcher’s trade by looking at how many butchers stayed in business at their respective markets between 1818/28, 1828/38 and 1818/38. For instance, twenty out of Washington Market’s 55 butchers (36%) in 1818 stayed in business at the market until 1828. Between 1828 and 1838, 22 butchers (40%) stayed at the market. When comparing the two decades, one still finds eight (15%) of the original butchers at Washington Market. Overall, for the six markets selected, 42% of the butchers between 1818 and 1828, 44% of them for between 1828 and 1838, and 17% of them over the two decades continued retailing meat at their original markets. Table 7 focuses on a shorter period, and
examines how many times over the five years between 1832 and 1836 butcher stalls changed occupancy. Staying with Washington Market, out of the 55 butcher stalls, 32 (58%) had no change of occupancy, 17 (31%) changed occupancy only once, while four (7%) changed hands twice, and two (4%) three times. This adds up to a total of 31 cases of occupancy change, three of which were transfers between family members, while another one was simply a butcher’s move from one stall to another in the same market. Over the five years then, Washington Market stalls were occupied on average for 3.2 years. With the exception of Franklin Market, which had unusually low rates of occupancy change, all the six selected markets behaved similarly. On average, over the five years, 58% of the stalls were held continuously by the original butchers, 23% had one, 11% two, and 7% three changes of occupancy. From these, 9% refers to transfers between relatives, another 7% to a butcher’s move from one stall to another, and probably many more to exchanges between trusted friends or master butchers and apprentices.

The evidence underlines that the market butcher’s business was permanent enough to establish one’s reputation and build a stable clientele. Butchers held on to their stalls for years. They seldom left their marketplace for another, and even if they did, they often transferred their stalls to a relative, a trusted butcher, or an apprentice. This stability was an essential element of the public market system. The myriads of petitions to the Council on behalf of individual butchers by customers testify to the direct relationship between buyer and seller. Considering that customers purchased meat several times a week, while an average butcher held on to his stall for over three years, potentially hundreds of transactions were conducted between the same buyer and seller. And for the consumer, repeated exchanges ensured that the regular butcher could be trusted with his merchandise. Whereas competition offered greater choice, the stability of the market business, and the repeated transactions it fostered put a premium on the butcher’s reputation. If a butcher violated socially agreed business practices, the customer had the option to turn to another vendor at the same market, the Deputy Clerk could revoke the butcher’s license, while fellow butchers may have intervened to restore their market’s standing. The five lines of defense—city governance, consumer choice, peer-pressure, skilled craftsmanship, and the direct sustained relationship between buyer and seller—added up to a sophisticated system of quality control under the market system of provisioning.

The question is how markets compared to alternatives? It seems obvious that informal retailing should have negatively influenced food quality. First, even if unlicensed retailers—
selling meat at the street, from their homes, or at shops and basements—faced fines from city officials, they did not have to meet up to the same scrutiny of quality control. If they escaped fines, or were tolerated by the authorities, their goods could be as low quality as consumers tolerated. Second, with the exception of shop butchers, who were forced into unlicensed vending until 1843 because of the unavailability of market stalls, informal retailers, including grocers, knew little about meat compared to market butchers. Third, lacking a membership in a tightly-knit urban craft meant less peer-pressure from fellow tradesmen. Outside meat vendors may have worried about the reputation of their business, but they did not have to uphold the standing of their craft. Fourth, ongoing direct relationship between buyer and seller was less structured in the case of unlicensed vending. Informal trade, especially street vending, was by definition an unstable endeavor both spatially and over time. Of course, a grocer or a shop butcher, even if unlicensed, also needed to maintain a stable clientele. Yet the reputation of market butchers derived not only from the repeated transactions between buyers and sellers, but also the sanction of city officials and fellow butchers. The informal nature of vending required sales to be kept in disguise. In short, the buyer had to trust more blindly the seller.

As for competition, different groups of vendors did not necessarily cater to the same clientele. Those who turned to street peddlers were the city’s poorest, whose choices were so constrained by price, that they had little freedom to worry about quality. Market laws incorporated the practice of street vending into the late evening market trade precisely because market butchers and street vendors sustained different customers. Customers who chose between market or shop butchers—or even grocers—represented a different case. If residents could buy fresh meat at a dozen or so stores within walking distance, they had just as much freedom to find the best price, selection and quality, as well as to build lasting relations, perhaps even credit, with specific vendors. It is also true that markets had the added advantage of offering all these options at one location, whereas spatially dispersed stores made the same routine of shopping at least more time consuming.

The legalization of meat shops in 1843, in theory, did away with most concerns of quality that derived from the unofficial nature of unlicensed vending. Still, certain concerns remained. Even if meat shop butchers were not unskilled in their trade, they did not go through the same long and rigorous apprenticeship as did the market butchers. Also, they more easily avoided the supervision of fellow butchers and city officials. One somber indication that even after
legalization the boundary line between official and unofficial meat shops remained porous is an 1847 police report produced for the Superintendent of Markets. Policemen were required to record each and every meat shop in the city. They found 426 of them dispersed across urban space, yet according to the Superintendent’s records, only 178 (42%) had paid fees and held valid licenses.\textsuperscript{94} Four years into liberalization, meat shops still escaped the control of city authorities. The Select Committee’s warning from 1840, it appears, was right on target: without proper supervision of the sale of fresh meat, deregulation would create a landscape of confusion, by replacing a dozen or so markets with hundreds of dispersed sites to monitor. The overall picture then is that in enforcing quality, the market-system was far superior to informal retailing, and probably much better than the free-market model of meat shops. It may have inconvenienced tens of thousands of residents in so far as the distances were concerned, or it may have been too costly by artificially restraining competition between vendors, yet from the narrow viewpoint of quality, the traditional system undoubtedly had its advantages.

Importantly, public health experts’ main complaints about the sanitary conditions of the city’s meat focused less on the liberalization of retailing than on the unregulated practice of slaughtering.\textsuperscript{95} According to police figures from 1851, besides the city’s eleven markets and 531 private butcher shops, no less than 206 slaughterhouses generated an estimated 375,000 animal carcasses. Decentralized slaughtering caused grave nuisances for residents.\textsuperscript{96} To begin with, butchers drove live animals across the city’s streets. Residents had to put up with intolerable sights and smells in the vicinity of slaughterhouses, many of which were located in densely populated areas.\textsuperscript{97} But most importantly, as the city grew, the removal of animal waste became an insurmountable problem. Offal, bones, hides, blood and other animal waste were transported through carts across the streets for processing or dumping. The city relied on outside firms for this job. Even with the greatest care, this was a sensitive business. Yet political corruption made matters worse, when the Council granted a five years contract to Reynolds & Company. By the summer of 1853, the private interest of some city officials in the firm became public knowledge, and the City Comptroller refused to pay a bill for Reynolds. Hearings by the Public Health Committee exposed not only the political corruption, but also the dreadful sanitary conditions of many slaughterhouses, the nuisances they caused to residents, and the disturbing practice of dumping the city’s animal waste into the rivers. As hearings dragged on for over a year, even this poor service came to a standstill. The nauseating sights and odors from hundreds of butcher
shops and slaughterhouses prompted newspapers to intensify their campaign to force the noxious trades outside of the city. Still, the next decade saw minor improvements only, and only after the Civil War was slaughtering pushed outside of the city.98

An equally important issue was the lack of systematic inspection of the city’s meat supply. Liberalization meant adding hundreds of retail outlets to the system, which likely further contributed to the decentralization of slaughtering and animal waste processing industries, such as bone and flesh boiling, or soap making. In and of itself, the deregulation of meat retailing was not the problem. Paris—even if with interludes—or Mexico City went through similar processes of deregulations a few decades earlier.99 Yet in New York, the liberalization of retailing was not complemented by increased regulations higher up in the provisioning chain, in particular at slaughter-houses and/or a central wholesale market. Famously, in 1810, Napoleon I ended the practice of slaughtering in Paris by building five public abattoirs in the outskirts, which opened five years later. In 1858, Napoleon III and his Prefect of the Seine Baron Georges-Eugène Haussmann improved the system by the reconstruction of the city’s central market—Halles Central—, and connecting it by underground railway to the livestock market and abattoirs at La Vilette.100 The point is that the free market may have been a proper way to organize the daily exchanges between retailers and consumers, but only in so far as the meat offered for sale was thoroughly inspected at abattoirs and a central market.

What is puzzling about New York is that city officials fully understood the issue, but failed to act. Throughout the 1840s and 1850s, public health experts called in vain for replacing the city’s hundreds of slaughterhouses with public abattoirs to be located north of Fortyeth Street along the two rivers. The first to raise the subject was John H. Griscom, a disciple of Edwin Chadwick of London and Alexandre Jean-Baptiste Parent-Duchâtelet of Paris.101 As City Inspector in 1842, he argued for public abattoirs, which view was echoed by the annual reports of his successors. A believer of the miasma theory of disease—that epidemics were contracted through foul air—Griscom was more concerned about nuisances than the inspection of meat.102 Yet three years later, City Inspector Cornelius B. Archer expanded on Griscom’s points, and by revisiting the 1842 case of meat poisoning, he advocated the adaptation of the Parisian model of abattoirs, demanding that “all animals slaughtered at these places, should be subjected to rigorous inspection, condemning all that are unsound, and that no meat should be offered for sale in our market that had not been inspected and approved of.”103 Interestingly enough, the most
elaborate treatise on the subject came from a civic-minded citizen, Joseph L. Frame, who, in 1850, petitioned the Council on behalf of a large constituency of residents. His proposal, swiftly shelved by officials, included a more than twenty-page discussion on the public health benefits of abattoirs—addressing nuisances and inspection—, expenditure and revenue estimates, and sketches of construction plans. Report after report, City Inspectors expressed the same concerns. If after 1850 they devoted fewer pages to public abattoirs, it must have reflected their frustration with having to repeat the same arguments at no avail.

A less effective, but still feasible strategy would have been to inspect food at a central wholesale market, similar to Halles Central. By the 1840s, the city’s largest market of Washington fulfilled such a role, albeit unofficially. The Council did make an effort to rebuild the dilapidated Washington Market in 1851. Plans were solicited, groups of vendors and city officials were consulted, and even appropriations were made. Yet as viewpoints clashed over the new market, plans were set aside, and finally Mayor Fernando Wood in 1854 vetoed the ordinance to rebuild Washington Market. The city missed another opportunity to upgrade its infrastructure of provisioning, even if as imperfectly as only to modernize its largest emporium of food. By 1860, City Inspector D. T. Valentine stated that Washington and Fulton Markets—the two unofficial wholesale markets—“cannot be repaired, for there is nothing to repair, while their demolition would give satisfaction to all.” One year later, the Superintendent of Markets suggested the sale of the property, and the building of a new market at the nearby site of West-Washington Market, “now covered by all kinds of sheds, intercepted by filthy paths.” His proposal no longer referred to a splendid wholesale market, but even this modest plan did not materialize. As for the city’s retail markets, two decades of neglect showed its impact: in 1860, the City Inspector described the public markets as “a disgrace to the city.” The most likely explanation of municipal inaction was the troubled state of public financing. Building a system of public abattoirs and a central wholesale market would have been a costly undertaking. The City Corporation’s unprecedented indebtedness following the completion of the Croton canal in 1842 presented a major obstacle to raise the necessary funds for expanding the infrastructure of provisioning.

By the mid-1850s, City Inspectors were increasingly alarmed of unwholesome provisions. According to George W. Morton, while the sale of diseased meat disproportionately affected the poor, “to whom cheapness of price is an irresistible inducement,” unsound
provisions were sold not only by hucksters and peddlers, but also at markets and especially in
basements across the city.\textsuperscript{111} The indirect evidence presented is suggestive that the deregulation
of meat retailing in 1843 had a negative impact on the quality of the meat supply. Combining
five lines of defense—city governance, consumer choice, skilled craftsmanship, peer-pressure,
and sustained direct relationship between buyer and seller—public markets offered a far superior
system of quality control than the city’s expanding informal meat trade, and performed better
than the free-market model of dispersed private butcher shops. The best alternatives, pursued by
other cities, to increase municipal oversight higher up in the provisioning chain at public
abattoirs and/or a central market were either not attempted or abandoned. Meanwhile, New
York’s population grew from around 300,000 in 1840 to a little over 800,000 by the eve of the
Civil War. Municipal inaction in the context of rapid urban growth resulted in an increasing loss
of oversight over the entire provisioning chain from slaughtering to wholesale meat trade and
retailing. Moreover, the lack of investment in existing markets allowed for the dilapidation of a
once successful infrastructure. The literature agrees that the overall outcome had to be chaos.\textsuperscript{112} As Horowitz puts it, after deregulation “consumers may have found obtaining meat more
convenient,” but their meat was “almost certainly not as wholesome.”\textsuperscript{113}

It would be useful to test these claims in the scrutiny of systematic evidence. Lacking
data on the quality of the city’s meat supply, one such strategy is to look at mortality statistics.
Unfortunately, New York did not register births during the period, which makes the calculation
of infant mortality unfeasible. In absence of a better option, figure 11 compares crude death
rates for New York City, Boston, and Philadelphia between 1820 and 1860.\textsuperscript{114} Clearly, crude
death rates are not sensitive indicators of the quality of the food supply. At the period, they were
more likely related to changing factors of the urban disease environment such as overcrowding,
sanitation—availability of water and sewer systems—-, epidemics, social inequalities, and
demographic changes. Nevertheless, crude death rates help trace temporal patterns in mortality,
and comparing trends across cities can be suggestive.

Looking at the figures, it is clear that by the mid-1830s, New York became by far the
least healthy of the three cities. Until then, mortality in New York and Philadelphia moved
closely together, while in Boston it shifted to a lower equilibrium from the mid-1820s. Between
the mid-1830s and mid-1840s, mortality trends further diverged. New York City endured the
same high annual mortality rates of 24 to 30 deaths over a thousand, Boston sustained lower
rates of between 18 and 22, while Philadelphia experienced a favorable decline from New York to Boston rates. Between the mid-1840s and 1860, mortality rates skyrocketed in New York, reaching between 28 and 40, excluding the years of major epidemics, they rose in Boston (24-30), albeit for a shorter period of time, while in Philadelphia, they remained low (20-26).

New York City’s comparatively high mortality should come as no surprise. As the country’s first metropolis, it was by far the largest recipient of European immigrants from the 1830s, and especially the 1840s. All unfavorable conditions of the urban disease environment, from overcrowding to poor sanitation and widespread poverty were amongst the worst here. Boston’s better health had to do with the city’s smaller size and colder climate. Its population quadrupled over the four decades to reach a little below 180,000 by 1860, only 22% of New York City’s population. The notable rise in mortality during the 1840s was related to massive European immigration and overcrowding in the city’s center. While Boston had a relatively extensive sewer system, outside water from Lake Cochituate was brought in only by 1848. By the mid-1850s, death rates began to decline as immigration slowed, putting less strain on the municipal infrastructure, while the city also started to decentralize.115

Philadelphia’s low mortality is revealing. Thanks to early industrialization and large-scale immigration, the city’s population reached a little over 560,000 by 1860— an almost five-fold increase over forty years. Yet the city’s Fairmont Waterworks, constructed between 1819 and 1822, was the first in the nation, while overcrowding was a smaller concern, as Philadelphia had more space to expand than the other two cities. Overall, the city managed to keep mortality at reasonably low levels, even as the population grew exponentially over the 1840s and 1850s.
The literature has not focused on the role of food provisioning in explaining urban mortality. Yet one difference between the three cities, which may explain a small part of their divergent trends, concerns their supervision of the food supplies. Even though much smaller in size than the other two, by the second quarter of the century, Boston already relied on a central cattle market and slaughterhouse at Brighton Market for its fresh meat supplies. In addition, between 1823 and 1826, the city rebuilt and expanded Faneuil Hall to include Quincy Market, the city’s wholesale market. As for Philadelphia, despite the alleged popularity of provision stores, in 1857 there were still thirteen markets in the city with a total of 3,442 stalls—a much more extensive system than the one in New York for a considerably smaller population. By 1859, the city shifted to a liberal experiment of incorporating market houses, and turning them into private businesses. Yet until the end of the 1850s, the city’s tightly monitored retail markets remained the primary source of food for residents. In short, New York City preceded Philadelphia about two decades in deregulating the retail of fresh meat, while it had no comparable infrastructure of a central slaughterhouse or a wholesale market that supported quality standards in Boston. Out of the three cities, New York was consuming by far the largest amount of meat, yet it had the least capacity of monitoring the quality of the supply.

To what extent these differences mattered for mortality is impossible to know. The trend of rising death rates in New York between 1845 and 1856 had to do above all with rapid urban growth fueled by immigration, combined with poor sanitary conditions and overcrowding in unhealthy tenements. Yet the temporal correlation between the liberalization of meat retailing in 1843, and the decisive and continuous rise of mortality after 1844 is noteworthy. From 1804, City Inspectors collected statistics on all deaths and their causes in New York City. One category at which it is worth taking a closer look is diarrhea, as it is the most closely related to food quality of all the diseases identified. Figure 12 charts the percentage of diarrhea caused deaths to the total number of deaths between 1820 and 1860. It shows clearly that from the mid-1840s, diarrhea related mortality rose to levels about two or three times as high as in the preceding decades. Between the mid-1840s and mid-1850s, diarrhea “caused” roughly 3-4% of all deaths in the city.

There are two major concerns with this approach. First, diarrheal diseases are mainly caused by poor sanitary conditions, whether deriving from contaminated water, poor sewerage, or unclean and poisonous food. The rise in diarrhea related mortality may reflect issues at any
crucial points of urban sanitation. As for the water supply, by 1842 New York completed its gargantuan public works project to bring Croton water to the city.\textsuperscript{120} Even if Croton water did not reach most households for decades to come, New Yorkers in the mid-1840s had access to much cleaner water than before. It is also true, that the increase in the city’s water supply must have put extra pressure on its sewers. In their annual reports from around the 1840s, City Inspectors regularly emphasized the need to improve the sewer system. Still, the most obvious explanation for the rapid rise of diarrhea cases—contaminated water—can be excluded.

Figure 12: Percentage of diarrhea caused mortality (1820-1860)

The second concern is misdiagnosis. After all, diarrhea is not a disease per se, but rather a symptom. Its rapid rise from 1845 to 1847 may be mistaken for changes in the categorization of diseases. Yet physicians reported the causes of deaths to the City Inspector without any standardized nomenclature to follow.\textsuperscript{121} Even if the diagnosis of diarrhea may have changed, under such decentralized ways of collecting statistics, this would have happened gradually. City Inspector A. A. White (1847-1850) repeatedly demanded such a nomenclature, and complained that physicians often issued useless death reports.\textsuperscript{122} His examples did not focus on diarrhea, which probably was not that difficult to diagnose. If diarrhea was to be confused with another disease, the most likely candidate was dysentery.\textsuperscript{123} Yet between 1830 and 1860, dysentery and diarrhea caused mortality rates moved closely together. In fact, the increase of dysentery between the mid-1840s and mid-1850s was even more marked than for diarrhea.\textsuperscript{124} This is to say that even if there was some confusion whether to label a death with diarrhea or dysentery, this would have made little difference in the observed trends of a notable and lasting increase in diarrhea related mortality soon after the deregulation of meat retailing.
All evidence points to the same conclusion. Diarrhea related mortality rose dramatically from the mid-1840s. In 1842, the city had already endured a localized incident of meat poisoning, while by the mid-1850s, City Inspectors expressed growing concerns about unwholesome provisions. In 1854, incompetence in the city’s handling of the removal of animal waste was exposed by the Reynolds-scandal, which temporally brought this already poor service to a stand-still. These were only symptoms of more endemic problems, which had to do with the decline of the public market system from the 1830s, the parallel expansion of informal meat retailing, the liberalization of meat shops from 1843, the spatial dispersion of slaughterhouses, and the municipality’s lack of commitment to build a modern infrastructure of public abattoirs and a wholesale market that would have allowed for the inspection of the city’s meat supply. In the context of rapid urban growth, all of this meant that city officials lost oversight of Gotham’s food supplies at all levels of the provisioning chain. The outcome must have been a general decline of the quality of New Yorker’s provisions, especially as concerns the most sensitive and extensively consumed item of fresh meat.

(4) Inequality in Access to Food

Thus far the analysis presumed the average New Yorker as the consumer. Per capita consumption figures or statements concerning the general quality of the city’s meat supply are informative, especially to study change over time. But they overlook the central issue of how the observed trends affected different social groups of residents. New York, compared to most other major Western cities, had an exceptionally diverse population, stratified by class, national origin, and race. Both Komlos and Haines underline how recessions and rising disparities of income, which characterized the period of early industrialization, disproportionately affected the nutritional status of lower income groups. Their data bear out that the decline in physical stature was more pronounced for lower than middle-class Americans. In turn, as cities represented an ever greater share of the national population, the worsening of the health and nutritional status of the urban working-class contributed to declining average physical stature. If New Yorkers—on average—from the mid-1830s ate less and poorer quality meat than a generation before, it is important to know how these trends affected consumers of different social status.

Meat consumption differed with income in two principal ways. Most obviously, better-off New Yorkers could afford to eat more meat. It is also true that in New York even the poorest
ate an impressive amount, despite that overall meat consumption likely declined after the mid-
1830s. Perhaps more importantly, wealthier residents had access to what were considered better
quality cuts. De Voe’s *The Market Assistant* attests to the strict hierarchy of the different cuts of
beef, New Yorkers’ primary source of protein.

The hindquarters were considered the choice quarters, which were separated into smaller
cuts to form sirloin or rump roasts. Roasts from the first nine ribs of the forequarters were also
much valued. The other premium cut from the loin was the steak, which was served mostly in
eating houses or broiled over open fires. As a smaller cut, it was accessible even to working-
class residents on rare occasions. Most of New Yorkers, however, could not afford expensive
roasts or steaks, but depended on tougher and bonier cuts eaten largely in stews or soups. These
included the flank and the rounds from the hindquarters, and the brisket and plate from the
forequarters, eaten mostly in stews, as they needed to be cooked longer in water. Bony meats
such as the neck, shoulder and thigh were mainly served in soups, while beef livers and kidneys
were eaten both in stews and soups. The cheapest cuts were the beef shins, which, according to
De Voe, were good for nothing but stock for soup, while beef brisket and plate were used chiefly
for cured beef. A similar, although less elaborate hierarchy existed for the other butcher’s
meats as well. For veal, the hindquarters, divided usually in the loin and the leg, were the choice
pieces, commanding the highest prices, while the forequarters, containing the shoulder, neck, and
breast were less popular, and were often used for stewing. Similarly, for mutton and lamb, the
leg and loin were the choice pieces, and for pork, the loin was considered the best meat.

Overall, better-off residents were more likely to purchase boneless, tender, and more flavorful
cuts, which they often ate as roasts or steaks. On the contrary, the city’s poorer residents
depended on lower quality cuts—tougher, leaner, bonier, and with less meat on them—served
mostly in stews and soups.

De Voe understood from firsthand experience how different social strata of customers
purchased different quantities and quality of meat. It is also true that he was a butcher at
Jefferson Market, which supplied some of the city’s wealthiest communities. Historians have
widely noted that from around the 1830s, social inequalities increased in New York, while urban
expansion was complemented by greater segregation based on class and ethnicity. Even if De
Voe outlines the contours of unequal meat consumption, for a more systematic approach, one
needs to study how spatial relations contributed to differential access to meat. Elsewhere, I
argued that traditionally the market schedule defined residents’ daily shopping routines. As the day progressed, the variety and the quality of provisions declined, and so did their prices, sorting different strata of customers for specific times of the day to visit the city’s markets. From the 1830s, however, a fragmented landscape of provisioning emerged with public markets, dispersed private stores, and mobile street vendors offering greater flexibility for households to schedule their shopping. By this time, New Yorkers also looked for shelter in an increasingly segregated housing market. Just as the strict correspondence between the time of shopping and one’s social status faded, so did residential location become an ever more important factor in determining one’s range of options to access food retail outlets.

Looking at the maps of the expansion of the market system (maps 5-12 and table 5), two distinctive spatial patterns becomes visible: north of Fourteenth Street, New Yorkers had no public markets to rely on, whereas those living in the city’s central and southern districts had access to a range of retailers, including public markets, private stores, or street vendors. Additionally, the scale and quality of the public markets progressively declined from west to east, which spatial pattern became increasingly pronounced from the mid-1830s through the 1840s and 1850s.

Four hypotheses were proposed to account for this west to east decline. The first, that this may have reflected the spatial organization of real estate values, was rejected based on Robert Margo’s study of the distribution of rental prices in Manhattan between 1830 and 1860. His findings show that on average rents progressively declined moving northward from City Hall. While this finding is consistent with the market data, Margo also points out that rents fell more markedly in western neighborhoods than eastern ones, which is the opposite of the trend observed in the case of rental values at the public markets. Additional GIS analysis refuted the second hypothesis that the west to east decline corresponded to shifting population densities. On the contrary, eastern wards were more densely populated than western ones, even as they were supplied by smaller and lower quality markets. Hence a growing mismatch between the location of public markets and local residents’ demand for fresh food emerged from the 1830s. The third hypothesis, which suggested that eastern markets faced greater competition from private butcher shops, grocers and informal vendors, was confirmed by spatial analysis. Residents in the eastern wards, despite access to public markets, were more likely to purchase their provisions at meat shops, groceries, or from street vendors than those living in the west. I will now address the
fourth hypothesis, which concerns the role of income inequalities and cultural preferences. The subsequent maps (13-24) pursue spatial correlations between the hierarchy of the markets and a range of ward level social indicators based on state census data from 1845 and 1855.\textsuperscript{132}

The first four maps (13-16) examine the class status of the city’s wards in 1842 and 1845. Lacking ward level income data, I use four proxies: first, ward level per capita personal estate; second, the ratio of children attending public versus private schools; third, the percentage of mechanics within the population of each ward; and fourth, the number of residents per attorney in each ward. Needles to say, these indicators are from perfect. With regards to the most direct measure, personal estate, there is concern about the quality of the data.\textsuperscript{133} As for the ratio between students attending public versus private schools, the literature does suggest a strong correlation with social class.\textsuperscript{134} By the 1840s, private schools requiring tuition served the wealthy, whereas working-class families sent their children almost entirely to common schools. Middle-class families were more divided on their choice. The last two maps follow the more conventional approach of looking at occupations. The percentage of mechanics and the number of residents per attorney are reasonably good proxies, as they reflect the spatial distribution of one working-class and one middle-class occupation respectively.

Looking at per capita personal estate, the highest rates were found for the city’s southern and central wards, reflecting the concentration of commerce in these areas—I excluded ward 1 from the analysis, as it no longer had a significant residential population. The poorest residential wards (10, 11, 13) were all located on the east, except for the northern ward 16. The wealthiest was ward 15 (Greenwich Village) on the west, where most of Jefferson and Tompkins Markets’ customers resided. Despite its working-class character, ward 7 on the east had relatively high per capita personal estate because it concentrated a lot of shipping and commerce, while the Bowery, one of the city’s commercial arteries, also bordered the area. As for common versus private schooling, one finds consistently falling ratios from west to east. Families in the eastern wards were much more likely to send their children to public schools than those living in the west. The highest ratios were found in wards 11 and 13 in the east, and in wards 4, 6 and 15 in the center. In addition, wards 7 and 17 in the east had relatively high ratios. Ward 15, with the highest personal wealth, also had the lowest rate of public schooling. The occupational maps further confirm these patterns. The highest percentage of mechanics was in the central wards of Maps 13-16: Socio-spatial relations, 1842 & 1845
Maps 17-20: Socio-spatial relations, 1845 & 1855
Maps 21-24: Socio-spatial relations, 1845 & 1855
10 and 14, followed by the southwestern wards of 5 and 8, and the eastern wards of 7, 11 and 13. On the contrary, virtually no attorneys lived in the eastern wards of 11 and 13, only a few resided in the eastern and central wards of 4, 6, 7, 10 and 14. On the west, only ward 8 had a similarly low number of attorneys. Again, ward 15 was the most likely area to give home to members of this middle-class profession.

Comparing more directly the biological standards of living, the next two maps (17-18) examine ward level crude death rates in 1845 and 1855. Interestingly, mortality rates in 1845 did not follow any clearly discernible spatial pattern. By 1855, however, one finds rising mortality rates moving from west to east. Mortality was the highest in ward 1 in the south, ward 6 in the center (where the notorious “Five Points” was located), and ward 24 in the north. The second tier of high mortality rates were confined to the eastern wards of 4, 7 and 13, and to the northern wards of 18 and 20, while the third tier included wards 11 and 17 on the east, ward 14 in the center, and ward 5 on the southwest. Ward 5 was, in fact, the only western area with relatively high mortality. All the other western wards (8, 9, 15 and 16) belonged to the city’s healthiest districts. In comparison, the only eastern area with similarly low mortality was ward 10.

The other important factor is the residential distribution of immigrants. The subsequent two maps (19-20) study the percentage of foreign-born within the population of each ward in 1845 and 1855. The distribution of immigrants followed clear south to north and west to east patterns. Both in 1845 and 1855, ward 1 and the southeastern wards of 4 and 6 had the highest percentage of foreign-born. By 1855 more than two-thirds of the residents of these wards were born abroad. In addition, eastern wards were more likely than western ones to give home to immigrants. This trend is more discernible for 1855 than 1845, showing how as the city expanded northward, so did northeastern wards become increasingly immigrant. By 1855, wards 11, 17 and 18 on the northeast, and to a lesser extent, wards 7, 10, and 13 on the east joined the club of the city’s most immigrant areas. In contrast, the city’s most native wards (8, 9 and 15) were all located on the west. It is also true than in New York, even the most native ward 9 was nearly one-third foreign-born.

The Irish and the Germans were the two largest foreign ethnic groups (maps 21-24). As for the Irish, the 1845 census refers to those born in Great Britain, whereas the 1855 census includes a separate Irish-born category. The Irish, representing 28.2% of the total population in 1855, lived all over the city, but especially in the central and southeastern wards of 4, 6, 7 and
and in wards 18, 19 and 21 on the northeast. Even if the percentage of Irish-born was among the highest in wards 1 and 2, by the 1840s these southern areas gave home to very small populations. The spatial distribution of Germans followed a simpler pattern. Throughout the period, Germans—representing 15.7% of the city’s population by 1855—concentrated in around Klein Deutschland, at the intersection of the eastern wards of 10, 11, 13 and 17. It is also true, that even in the most German ward 11, “only” one-third of the residents were born in one of German states, whereas for the Irish ward 4, the Irish-born represented nearly one-half of the total population.

The fact that east of Broadway—and further north, east of the Bowery—the city’s wards were more working-class and immigrant in character is hardly a new finding. Scholars have made the same point before, underlining the growing social inequalities of mid-19th century New York City. Yet comparing the spatial organization of food retailing to more widely noted socio-spatial patterns allows for new interpretations concerning a less understood aspect of the standard of living: household provisioning. Unfortunately, the analysis has to be limited to south of Fourteenth Street, as communities north of this line were left without convenient access to public markets, and no comparable data are yet available to study private retailers. But in so far as the market data reflect the quantity and quality of the food supply, new conclusions can be drawn about social inequalities in access to food.

Overall, the maps point to two conclusions. First, the west to east decline of the market system strongly corresponded to New York’s increasingly demarcated class relations of space. Residents living in more working-class eastern wards had to be satisfied with smaller and lower quality markets. This was most obvious for wards 10, 11, 13 and 17, a large and densely populated working-class district, systematically underserved by this infrastructure. Given the insufficient market facilities, local residents relied chiefly on meat shops, groceries, or street vendors to purchase daily provisions. The same pattern, although to a lesser extent, applied to the southeastern wards of 4, 6 and 7. Residents here still had access to Catharine, tiny Goveneur, and marginally to Essex and Centre Markets. Yet by the 1840s, with the exception of Centre, these became insufficient to supply these densely populated working-class districts. Catharine, once one of the city’s best markets, declined both in terms of its relative volume of trade and the value of its stalls from the 1830s, suggesting that much of its business was captured by stores and informal retailers well before deregulation in 1843. At the other end of the spectrum were the
western wards of 8 and 9, and especially 15. These well-off districts had access to larger and more expensive retail markets: Clinton and Centre in the inner, and Jefferson and Tompkins in the outer ring. In particular, ward 15, the city’s wealthiest residential area, was conveniently situated between the two best outer ring retail markets, Jefferson and Tompkins.

The second conclusion points to the importance of ethnicity. Wards 10, 11, 13 and 17, the area with the least access to public markets, and with a very high concentration of meat shops, also comprised the German settlement of Klein Deutschland. As Robert Ernst points out, Germans engaged in the butchering business more than any other ethnic group. Capitalizing on their old world skills as food purveyors, and serving a traditionally meat-eating ethnic clientele, German butchers became successful neighborhood entrepreneurs. As early as 1846, about half of New York’s butchers were immigrants, mostly of German, but also of Irish and English origin. By 1855, no less than two-thirds of the city’s foreign-born butchers were Germans. It is likely that an ethnic divide persisted between market and shop butchers—further study is needed to see to what extent. Market butchers belonged to a closed trade with an apprenticeship system and tight organization, while obtaining a stall depended on petitioning and connections. In short, market laws protected native-born butchers from the competition of newcomers. Deregulation in 1843 opened the floodgates of immigrants entering the butchering trade, and Germans seized the opportunity. Opening a meat shop was much easier than to penetrate the closed world of market butchers. The point is that residents of Klein Deutschland may have been left without sufficient public markets, and had to rely on meat shops, groceries, or even street vendors. Yet many of the local retailers, and certainly most of the butchers, were of German origin. Besides selling more familiar food items or cuts of meat, butchers were also known to local customers by virtue of belonging to the same ethnic group. Moreover, coming from a meat-eating culture, Germans were comparatively experienced shoppers when it came to provisioning their households with proper quality of meat.

The Irish had an entirely different situation. The northeastern Irish wards of 18, 19 and 21 were left without public markets, while the southeastern wards of 4, 6 and 7 had access to markets, but those fell short of the needs of these densely packed working-class areas. Local residents increasingly relied on meat shops, groceries or street vendors. But unlike the Germans, Irish households could not draw on strong ethnic ties for food purveyors, while they also had much less experience with buying and preparing meat. By the 1850s, corner groceries already
passed from Irish to German hands, and the Irish did not make it in the butchering trade at any comparable rate, in part because they could not draw on old world skills in handling meat. As food retailers, they engaged in marginal trades as fish and oyster dealers, marketmen, fruit and produce vendors, or peddlers.\textsuperscript{138} In short, the Irish of the southeastern wards had access to a range of food retail outlets. Yet area markets were insufficient in scale and quality, market butchers were likely to be of native origin, and compared to Klein Deutschland, storekeepers were unlikely to share ethnicity with their customers.

A stark contrast to this situation was that of the well-off western wards of 8, 9 and 15. Here native-born residents purchased meat at larger and better quality markets from craftsman butchers who were also likely to be native-born. Of course, meat shops and groceries also operated in the area. As I argued elsewhere, groceries were evenly distributed across urban space, and butchers retailed from shops in these wards as well.\textsuperscript{139} Differences in the daily routines of provisioning were relative, just as the nativity of a ward was a matter of scale in a city where even the most native ward was one-third foreign-born. Still, living in ward 15, and being supplied with fresh meats through De Voe’s neatly kept stall at Jefferson Market was a different condition of provisioning than frequenting one of Klein Deutschland’s ethnic shop butchers, or than shopping at the overcrowded Catharine Market or corner groceries, meat shops or peddlers of the Irish ward 4.

To conclude, there is strong evidence that spatial relations of class and ethnicity shaped New Yorkers’ options of food retailers. In the north, there were no markets at all. South of Fourteenth Street, where the public infrastructure still existed, the most densely populated, immigrant working-class wards were supplied by comparatively smaller and lower quality markets. Whereas middle-class residents in the western wards were more likely to continue the old routine of relying on craftsman butchers retailing out of markets, working-class shoppers had to complement and/or substitute the traditional marketing journey with purchases at meat shops, groceries or street vendors. These trends were not absolutes, as residents even in the wealthiest wards relied on groceries or shop butchers. Still, they represented real differences in the daily routines of household provisioning based on class and ethnicity. These spatial relations, of course, only complemented the more obvious source of inequality that poorer residents had less disposable income to spend on food. Working-class consumers purchased less and/or lower quality meats than those better-off. This is also to say that the causation worked the other way.
around as well: markets in working-class immigrant wards were smaller and of lower standard because local residents could only afford less and cheaper cuts of meat. This was reflected in the market revenues collected, the average rental prices of the butcher stalls, as well as the widespread competition of stores, groceries and street vendors—offering bargain prices, and selling in smaller quantities than market butchers—that characterized working-class districts.

The overall point is that it made a difference from whom and under what conditions one purchased meat and other fresh foodstuff in New York City. In addition to growing disparities of income, which contributed to unequal meat consumption, changing socio-spatial relations from the mid-1830s further perpetuated inequalities in access to wholesome food. As argued earlier, municipal markets were a formidable, and probably the only mechanism of quality control for fresh food at the time. New Yorkers relying on meat shops, but especially on groceries and street vendors, were running comparatively greater risk of consuming poor quality, potentially even contaminated provisions. Residents of working-class Klein Deutschland could at least rely on personal connections with the ethnic butcher or grocer as well as their own experiences with handling meat as shields against irresponsible retail practices. Yet for the much larger Irish community, and for most of working-class residents, such ethnic ties were less likely to compensate for the shortcomings of a deregulated and unmonitored retailing system in ensuring basic standards of quality. If my earlier conclusion was that the overall quality of the meat supply most likely declined from the 1840s, this now has to be qualified by adding that falling quality—just like falling per capita nutrition—disproportionately affected working-class and poorer residents, who in turn, represented an ever greater share of the city’s population.

**Conclusions**

I have suggested a series of conclusions about New York City’s meat supply during the first half of the long 19th century. Even if the limitations of a case-study approach are obvious, looking at America’s first metropolis offers new insights concerning the larger problem of the Antebellum puzzle. To begin with, new data based on food markets have been presented to estimate urban meat consumption levels for a much undocumented period. The data revealed that between 1790 and 1818, New Yorkers ate an impressive amount of meat (about 160 pounds of fresh red meat per capita), comparable to the highest recorded figures in American history during the 20th century. For the following decades, only circumstantial evidence is available.
Yet all data point to the widely acknowledged trend of falling per capita meat consumption from the mid-1830s. Evidence based on New York, Boston and Philadelphia corroborate Komlos’s tentative claim that this decline was related to the recession of 1837/43. The recession caused a temporary collapse of urban living standards, driving per capita meat consumption rates to unprecedented lows, from which they only recovered well past the Civil War. In so far as the amount of protein consumed at infancy, childhood and adolescence made a difference on adult body heights, the evidence is now stronger that the recession of 1837/43 exacerbated the Antebellum trend of declining physical stature.

The paper also highlights some of the distinctive qualities of urban provisioning. City dwellers consumed more meat than their rural counterparts who fed them. They also enjoyed the privilege of eating chiefly fresh meat—in particular, beef—all year around, whereas those living in the countryside relied mostly on preserved meats. Yet urban consumers paid a high price for depending on a complex provisioning system. External shocks—epidemic disease, war and other political calamities, or economic crises—could result in the temporary collapse of urban meat consumption. The specific causes or malfunctions of the provisioning chain may have differed case-by-case. For instance, at times of yellow fever or cholera, the supply of beef may have fallen drastically, as drovers avoided cities in fear of contracting the disease. Similarly, a war could isolate New York from its hinterlands, while also disrupting the daily functioning of the market infrastructure. During economic crises, city dwellers not only faced more concentrated financial hardships, but unlike their rural counterparts, they also had no alternative sources of food to fall back on. The point is that urban provisioning was a mediated process and not simply a function of supply conditions. The literature has yet to pay closer attention to how this mediation worked and changed during the early Republican and Antebellum periods, and how these processes affected overall standards of living in a rapidly urbanizing country.

The urban angle also brings the important issue of quality sharper into focus. Lacking direct data, I have based my conclusions on a closer study of the provisioning infrastructure. All evidence suggests that the deregulation of New York’s provisioning system from around the 1830s negatively affected the overall quality of meat and other fresh food supplies. These changes coincided in time with rising mortality rates in New York City, and the nationally observed trend of declining physical stature. Even if establishing direct causalities is beyond the reach of historical evidence, it seems safe to conclude that New Yorkers must have paid a price
in some aspects of their biological standard living for the worsening quality of their food. Historical GIS further revealed that widely noted trends of rising income disparities and residential segregation from the 1830s translated into systematic inequalities of meat consumption. Not surprisingly, the general trends of declining quantity and worsening quality of meat supplies affected different social strata of consumers differently across class and ethnic lines. New Yorkers experienced inequalities in many aspects of their living standards. While housing may have attracted the most attention from scholars, it appears just as important to document the unequal consumption of basic household goods such as food.

New York City, of course, is only one case, and it is easy to see how it may not be representative. Further case-studies are needed to arrive at more definitive conclusions about Antebellum urban meat consumption not only with regards to quantity, but also as concerns the less studied aspects of quality. Such a renewed and comprehensive approach to how American cities managed their infrastructure of provisioning in response to rapid urban growth would have the added benefit of providing joint pieces of the Antebellum puzzle in support of both lines of explanation: the nutritional thesis, and the focus on the disease environment and urbanization.


3 In so far as adult body-height is positively related to meat consumption levels at infancy, childhood and adolescence, it can serve as a useful proxy for studying living standards. Recent research also corroborates that assuming an ideal body mass, taller people tend to have stronger immune systems. Robert William Fogel, The Escape from Hunger and Premature Death, 1700-2100 (Cambridge: Cambridge University Press, 2004).


5 Ibid.: 908-919.


7 Until the invention of refrigerated railroad-cars and ships, transportation technology was not up to the task to ensure the shipment of fresh meat and milk over long-distances at sufficiently low-prices to offset this trend.

8 Key concerns include the reliability of early census figures, the problem of using production data for studying consumption, or the problems of converting animal counts into pounds, calories and proteins. This latter issue


11 An individual who spent infancy and early childhood in a county that produced a net surplus of protein by one standard deviation higher would have ended up about one to two-tenths of an inch taller as an adult than someone growing up in an average county. Growing up in a county with eight per thousand deaths more than the average resulted in 0.11 to 0.13 inch lower adult body heights. Spending infancy and early childhood in a county with good access to transportation reduced adult body heights by about a quarter of an inch, while for every ten percentage point increase in the urban share of a county’s population, adult height would have been one-tenth of an inch lower. Haines, "Development, Health, Nutrition, and Mortality: The Case of the 'Antebellum Puzzle' in the United States"; 11-12; Haines, Craig, and Weiss, "The Short and the Dead: Nutrition, Mortality, and the “Antebellum Puzzle” in the United States"; 405-407.


14 Haines, "Development, Health, Nutrition, and Mortality: The Case of the 'Antebellum Puzzle' in the United States".


16 For Fly Market, I have compiled monthly returns for 1816 from January to October. For Washington, the 1816 monthly returns miss only November, while there are additional data available for March, October, November and December of 1818, and from between January and April in 1819. Moreover, the Washington Market returns also include daily counts. As for Catharine Market, monthly returns are available from January to October in 1816, and for each month of the year in 1818. For sources: Common Council Microfilm Database, New York City Municipal Archives [CCMD (NYC-MA)]; “Returns of all the Beeves, Calves, Sheep & Hogs in the Different Markets of the City”, Market Committee: 1816, Box 59, Folder 1416; “Returns of all the Butchers in the Different Markets of the City”, Market Committee: 1818, Box 66, Folder 1535; “Returns of all the Beeves, Calves, Sheep & Hogs in the Different Markets of the City”, Market Committee: 1818, Box 66, Folder 1535; “Number of Creatures Sold in Catharine Market”, Market Committee: Stalls & Licenses, July-December 1818, Box 66, Folder 1537; “Returns of all the Beeves, Calves, Sheep & Hogs in the Different Markets of the City”, Market Committee: 1819, Box 72, Folder 1595.

17 Thomas F. De Voe’s original archives contain aggregated totals for Fly, Catharine and Washington Markets for between May and October of 1816, while his book cites aggregated animal counts for between January and September of 1818 for Fly, Washington, Catharine and the newly opened Centre Markets. In the case of
As a first step, I used all available data to fill the gaps, and to arrive at complete monthly returns for the three principal markets in 1816 and 1818. The more complete returns for 1816 were used as reference data to make estimates for 1818 when necessary. The second step was to estimate the volume of trade at the missing markets. In 1816, the number of occupied butcher stalls was 63 at Fly Market, 55 at Washington Market, and increased from 24 to 48 over the course of the year at Catharine Market. In comparison, the other markets were much smaller: in 1816, there were twelve stalls at Collect, six at Greenwich, five at Spring, three at Governor, two at Duane, and one at Corlars-hook Markets, whereas in 1818, there were eight in Essex, six at Greenwich, three each at Grand and Governor, and one at Corlars-hook Markets. Butcher stalls at these smaller markets represented less than 15% of all occupied stalls in the city in 1816, and only 10% in 1818. To estimate the volume of trade at these markets, I assumed a one-to-one relationship between the number of butcher stalls occupied and the volume of meat sales at a given market. The respective trade at Fly, Washington and Catharine Markets does bear out such a relationship.

It is impossible to know how substantial this portion was. Yet the fact that city officials were concerned foremost with the supply of fresh red meat, while respectable butchers, representatives of a powerful urban trading craft, would handle only beef, veal, lamb and mutton, and pork underline the social and cultural importance of red meat. Reconstructions of John Pintard’s 1811, 1814 and 1827 household budgets are also suggestive. They show that Pintard allocated 55% of his family’s meat expenditure to butcher’s meats, while the rest he divided about equally between cured meats and poultry, fowl and game. To be more precise, in 1811, Pintard spent 54.8% of his meat budget on red meat, 30.6% on processed and preserved meat, and 14.5% on poultry, fowl and game. The respective ratios in 1814 were 54, 26.4, and 19.6%, while in 1827, they were 56.9, 12.5, and 30.5%. Of course, one should be careful not to over-generalize based on a single case, especially when the sample comes from a high-income food budget. Pintard’s relative expenditures on preserved meat and poultry, fowl and game also changed too much year-to-year to establish any pattern even for this household. Moreover, one cannot convert Pintard’s expenses into actual amounts of meat consumed. Still, the fact that Pintard’s purchases of butcher’s meat hovers around 55% highlights that while red meat was of great importance, it constituted only part of the average New Yorker’s meat basket. While Pintard’s upper-middle-class family is not to be taken as representative, these ratios point to the prominence of red meat in the New York City diet. One should also note that poultry, fowl and game were comparatively expensive, and thus the meat basket of an average New Yorker probably relied more heavily on red and/or preserved meats. NYHS-MD: John Pintard Papers, “Marketing Account Book, 1811-1824”; John Pintard Papers, “Marketing Account Book, 1826-1830”; John Pintard Papers, “Record of Household Expenses, 1826-1828,” Box 9, Folders 1-3.

According to the 1816 and 1818 dataset, for a population of 93,634 in 1816, there were 19,165 cattle, 24,450 calves, 79,852 sheep, and 9,491 hogs slaughtered for sale at the New York City markets. Two years later, for an estimated population of 107,625, the corresponding figures were 20,535 cattle, 24,190 calves, 76,900 sheep, and 8,645 hogs. To translate these figures into per capita consumption of beef, veal, lamb, and pork, I borrowed the conversion rates used by John Komlos: 450 pounds of dressed weight for Northern cattle, 40 pounds for sheep, and 133 pounds for hogs. Komlos’s slaughter weights have been criticized by Robert E. Gallman for yielding smaller outputs per animals than those of other scholars. This is likely to be the case for pork. I still prefer using Komlos’s ratios for two reasons. First, they make my estimates comparable to those of Komlos and Haines for the mid-19th century, which are based on census figures. Second, by slightly underestimating slaughter weights, my estimates address the concern that there was probably a small increase in the average weights of cattle from between the 1810s until the middle of the 19th century. To establish average slaughter weights for calves is more problematic, given that the animal’s weight varies greatly with slaughtering age. For lack of better data, I use the tax ratio paid by the butchers: 24 cents per cow, versus 4 cents per calf. The average dressed weight of a calf is thus 75 pounds. Komlos, "The Height and Weight of West Point Cadets; Dietary Change in Antebellum America": 897-927; John Komlos, "Anomalies in Economic History: Toward a Resolution of The "Antebellum Puzzle"" The Journal of
During the two decades between 1790 and 1810, New York City’s population almost tripled, growing from 33,121 to 96,373, whereas Philadelphia’s “only” doubled, from 42,520 to 91,874 residents. Ira Rosenwaike, *Population History of New York City* (Syracuse: Syracuse University Press, 1972), 16.

The annual family income gradients used by Horowitz are as follows: the lower third represents families making under $1,000 in 1909, under $1,500 in 1942, and under $3,000 in 1965; the middle tier refers to families earning between $1,000-2,000 (1909), $1,500-3,000 (1942), and $3,000-6,000 (1965); while the highest income tier is defined as families with incomes over $2,000 (1909), $3,000 (1942), and between $6,000 - 15,000 (1965). The 1965 study also included a fourth, even higher income group, which was not present in the earlier surveys. To avoid skewing comparisons, Horowitz separated out this group from the study. Roger Horowitz, *Putting Meat on the American Table: Taste, Technology, Transformation* (Baltimore: Johns Hopkins University Press, 2006), 11-17.

As for pork, the figures were 67 pounds in 1909, 63.7 pounds in 1942, and 58.7 pounds in 1965. The gradual decline of pork consumption was compensated by Americans’ growing appetite for poultry of which they ate 14.7 pounds in 1909, 20.7 pounds in 1942, and 40.9 pounds in 1965. Ibid., 6.

In 1790, the city decided on the following method of collecting fees: the Council charged two shillings for every cow, four pence for every calf and sheep, and six pence for every hog brought to market. Subsequent market laws, such as the one from 1793, upheld the same rules of taxation. The 1812 and 1814 market laws also use the same rates, but in dollar-cents: 24 cents for each cattle, 4 cents for each calf and sheep, and six cents for each hog. For converting pennies to cents, I used the same ratio as did the City Council documents: 0.96 penny to a cent. By 1812 and 1814, there were special cases that slightly complicated this method of taxation. For example, the 1814 market law suggests that some of the butchers may have held licenses that exempted them from fees for certain items. Farmers, bringing their own animals to market, paid the exact same rates as did the butchers, and so did the city’s few licensed butchers who retailed from street stalls. However, those who resold items at the market with the Clerk’s permission had to pay three times as high fees, while those who violated the market laws paid high fines. On the whole, these were minor exceptions. The basic rule remained the same over the entire period: market fees were collected based on the animals slaughtered for sale at the city’s markets. For sources: Common Council, *Minutes of the Common Council of the City of New York, 1784-1831*, Vol. 1: 534; New York (N.Y.), *Laws and Ordinances Ordained and Established by the Mayor, Aldermen and Commonalty of the City of New-York* (New York: Hugh Gaine, 1793), 6-10; New York (N.Y.), *Laws and Ordinances Ordained and Established by the Mayor, Aldermen and Commonalty of the City of New-York* (New York: Pelsue and Gould, 1812), 154-164; New York (N.Y.), *A Law to Regulate the Public Markets* (New-York: J. Hardcastle, 1815).

For the period between 1790 and 1800, the Proceedings of the City Council report the total amount of market fees collected for each year. After 1800, the records are more sporadic, and require small corrections in order to arrive at annual fees. For 1801 and 1802, the records combine fees for two years, which I have separated out. For 1804, 1805 and 1806, the records refer to a full year, however, beginning in November 1 of the previous year. In these cases, I have not made adjustments, and thus the figures refer not to the calendar year but to the fiscal year. In addition, for 1804, only the amount kept by the treasurer was given, which was 50%, while the other half went to the Mayor’s coffers. For 1807, the recorded fee refers to fourteen months, also including November and December of 1806. In this case, I have relied on the 1816 data to estimate the percentage of fees collected in these extra months, which I have subtracted to calculate the annual total. For 1813, the recorded fee is again the annual total for the calendar year. Another complication is that for some years, the full amounts of fees are given, while at other times, the records provide the net amounts, which do not include expenses on sweeping and the Market Clerk’s salary. Knowing fairly precisely how much money was spent on sweeping, and given that the Market Clerk kept about 10% of the fees, I have estimated the full amount for each year when only the net fee was available. This is because the
full amount is a function of the number of animals slaughtered. As for 1816 and 1818, I have used the original Market Clerks’ returns complemented with De Voe’s records to estimate the total amount of fees collected. Incomplete market data from the Council proceedings for these two years confirm that the conversion method based on the Market Clerks’ returns of the animals slaughtered and the respective taxes paid on them produce reliable results.

Finally, I have used all available census records for New York City—1790, 1800, 1805, 1810, 1814, 1816, and 1820—to arrive at yearly population figures for the period, assuming a constant rate of population change between the two closest known observations. Rosenwaike, *Population History of New York City*, 18.


29 The 1798 yellow fever epidemic severely disrupted New York City’s economic life. The city’s system of provisioning virtually collapsed. Feeding the poor became the major concern of the Common Council’s Health Committee. Three provision centres were established. At the peak of the epidemic, between 1,600 to 2,000 people were fed daily at these centres. In addition, 800 more were provisioned through the Almshouse, and 500 families were permitted to obtain free rations at temporary stores. For a detailed account of this and the other yellow fever epidemics in New York: John Duffy, *A History of Public Health in New York City* (New York: Russell Sage Foundation, 1968), 105-109, 101-123.

30 Market fees remained virtually unchanged between 1794 ($4,659.84) and 1795 ($4,669.01), whereas they dropped dramatically from $5,112.92 in 1797 to $4,384.66 in 1798. According to Rosenwaike, in 1795, 732 people died of yellow fever. In comparison, the 1798 fever was much more devastating, resulting in the deaths of 1,524 people in New York City alone. If those who contracted the illness in New York but died outside the city are also included, the figures are well above 2,000. The 1805 fever was much milder, claiming “only” 262 lives. Rosenwaike, *Population History of New York City*, 16-19.

31 The embargo caused severe hardships to New York’s economy. For example, between 1807 and 1809, municipal expenditures on relief increased by about 70%. Burrows and Wallace, *Gotham: A History of New York City to 1898*, 412.

32 Billy Smith’s reconstruction of a Philadelphia labourer’s diet in 1772 offers one point of reference. In 1772, 57% of an “average” Philadelphia labourer’s supply of butcher’s meat came from beef, 27% from veal, 10% from lamb, and 5% from pork. The same per capita ratios in New York City in 1816 were 58% for beef, 12% for veal, 21% for lamb, and 8% for pork, while in 1818 they were 60, 12, 20, and 8% respectively. The data therefore suggest that whereas the ratios of fresh beef and pork in the red meat basket remained constant between 1772 and 1818, a notable decline occurred in the consumption of veal, which was offset by a comparable rise in the consumption of lamb.

However, direct consumption data based on two New York household accounts—those of Evert Bancker Jr.’s from 1787, and John Pintard’s accounts from 1811 and 1827—do not confirm these trends. In 1787, about 19% of the Bancker household’s meat budget was spent on veal, and about 25% on lamb and mutton. Pintard in 1811 spent about 31% of his meat expenditure on veal, and 10% on lamb, whereas in 1827, the same figures for his household were 25 and 18% respectively. It is, of course, problematic to compare three different households across four decades. Yet it is still noteworthy that the data do not corroborate a trend of declining veal and increasing lamb consumption over the period. If anything, they seem to point in the opposite direction. Similarly, archaeological studies of animal bones in Manhattan indicate an overall decline in the consumption of lamb from the early 18th to the mid-19th century. Of course, these diverging trends may simply reflect class differentials in food consumption patterns, after all compared to a Philadelphia labourer, the Banckers and the Pintards were well-off New York City families. Another possibility could be that the meat supply of these two cities differed in certain aspects. In short, the data are contradictory, which is hardly surprising given their sporadic nature. It makes sense at this point to simply assume constant conversion rates based on the 1816 market returns. Billy G. Smith, "The Material Lives of Laboring Philadelphians, 1750 to 1800" *The William and Mary Quarterly* 38, no. 2 (1981): 167-171; NYHS-MD: Evert Bancker, Jr., “Household Account Book of Evert Bancker, Jr., 1772-1776”; Evert Bancker, Jr., “List of Proprietors, Account and Survey Book, 1784-88;” John Pintard Papers, “Marketing Account Book, 1811-1824”; John Pintard Papers, “Marketing Account Book, 1826-1830”; John Pintard Papers, “Record of Household Expenses, 1826-1828,” Box 9, Folders 1-3; Nan A. Rothschild, *New York City Neighborhoods: The 18th Century* (Clintond Corners: Percheron Press, 2008), 146-149.
33 By 1818, the volume of meat sales outside the market system most likely increased. In 1817, the City Council ended its previous practice of licensing case-by-case street stalls and meat shops, and pushed those who remained outside the market system to the sparsely populated northern districts—north of First Street, east of the Bowery, and north of Thirteenth Street, west of Broadway. Some of these butchers relocated to the northern fringes of the city, where the collection of fees was more difficult. Others probably continued their business at the same location—in either case, in 1818 the Market Clerks must have missed accounting for more animals than two years earlier. At the same time, the Council decided to replace Fly Market, the largest in the city, with the modern Fulton Market. Stall counts suggest that butchers started to abandon Fly Market as early as 1818. Given that Fly conducted the largest volume of trade in the city, its gradual demise must have resulted in additional informal sales, in turn, leaving more animals unaccounted for. This explanation is also supported by the fact that the decrease resulted less from lower sales of beef, than from declining sales of “small meats”—veal, and especially lamb and pork. Violations occurred more frequently in these categories.

34 For converting animals into pounds of meat, I have again relied on Komlos’s slaughter weights. One problem is that over these two-and-a-half decades, slaughter weights may have slightly increased. Yet such changes must have remained small enough not to have a major impact on my estimates. If such a problem exists, it should produce slightly overestimated figures for the earlier years compared to the 1816 and 1818 market returns. For calculating the city’s population size in 1795, 1813 and 1818, I have relied on the nearest previous and subsequent census figures, and assumed a constant rate of population growth. Rosenwaike, Population History of New York City, 18.


39 Horowitz, Putting Meat on the American Table: Taste, Technology, Transformation, 12.

40 See endnote 19 for an analysis of John Pintard’s meat expenditures in 1811, 1814 and 1817.


45 This claim is further corroborated by Smith’s estimate of 174.5 pounds of meat consumed by a Philadelphia labourer in 1772. It is, of course, problematic to compare a labourer’s diet to per capita meat consumption rates. After all, a physical labourer needed more than average amounts of protein, which he may not have been able to afford. Yet the fact that only a few decades later, New Yorkers ate nearly as much fresh meat per capita as was the meat allowance of an adult male Philadelphia labourer, suggests that overall meat consumption probably increased during the period. The other possibility is that New Yorkers already ate more meat in 1772 than Philadelphians. Unfortunately no data are available for before 1790 to illuminate these trends.
The maps trace the expansion, relative decline, and changing internal hierarchy of the city’s public market system from between 1792 until 1855 across twelve points in time. For each map, the size of the circles assigned to the individual markets corresponds to their relative volume of trade, while the color-coding represents the data used for the calculation, which is also noted on the upper left corner. Depending on the year and the availability of the data, I use four kinds of indicators for assessing the relative volume of annual market trade. For 1792, 1816, and 1818, I rely on market revenue data based on sales taxes. For a discussion of sources and calculations, see endnotes 16-18, 20, and 24-26. For between 1828 and 1855, I use annual market rents collected from the butchers, and annual market fees collected from all the other vendors. See endnote 64. Finally, in lack of a better indicator, for 1800, 1810, and 1822, I use the number of occupied butcher stalls as a proxy for market revenues. See endnote 49.


47 I combined De Voe’s books and manuscripts with both published and archival municipal records to determine the number of available and occupied butcher stalls for each year between 1784 until 1860. Sources give stall counts and/or butcher lists for only specific years. For the missing years, I made informed estimates based on De Voe’s histories of the individual markets and using the years for which there were data available. Overall, the following sources have been used to compile stall counts: De Voe, The Market Book: A History of the Public Markets of the City of New York; NYHS-MD: Thomas F. De Voe, “Ground Plans of the Public Markets in New York City, 1694-1866”; Thomas F. De Voe, “List of Butchers in the City with some Biographical Notes, 1656-1844”; Thomas F. De Voe, “New York City Markets Collection, ca. 1817 - ca. 1878”, Boxes 1 & 2; Common Council, Minutes of the Common Council of the City of New York, 1784-1831: Matteson and Common Council, Minutes of the Common Council of the City of New York, 1784-1831: Analytical Index; CCMD (NYC-MA): “Returns of all the Butchers in the Different Markets of the City”, Market Committee: 1818, Box 66, Folder 1535; CCFP (NYC-MA): “Returns of the Different Markets: Clinton Market, 1847; Tompkins Market, 1847; Monroe and Governor Markets, 1848; Washington Market, 1855”; List of the Constables, Marshals, Butchers, Cartmen, and Porters, for the City and County of New-York, in the Mayorality of De Witt Clinton, esq. (Printed by H.C. Southwick, 1809).

48 Haines, “Health, Height, Nutrition, and Mortality: Evidence on The "Antebellum Puzzle" From Union Army Recruits in the Middle of the Nineteenth Century”; table 3; Komlos, “The Height and Weight of West Point Cadets: Dietary Change in Antebellum America”: 909, 913.


Population figures for New York City are available at five year intervals. For the intermittent years, I estimated population size by assuming a constant rate of change between the two known observations. For sources, see endnote 47 and: Rosenwaike, *Population History of New York City*, 36.

For Boston, I used the same method of estimating population figures, relying on decadal data. Richard A. Meckel, "Immigration, Mortality, and Population Growth in Boston, 1840-1880" *Journal of Interdisciplinary History* 15, no. 3 (1985): 401. Figures for the number of beef cattle slaughtered in New York City and at Brighton Market were compiled from the following sources. Aldermen, "Documents of the Board of Aldermen of the City of New-York", Vol. 6: Doc. 31, 374-375; Vol. 9: Doc. 46, 412; Smith and Bridges, "The Brighton Market: Feeding Nineteenth-Century Boston": 20-21. Like earlier, I used the same dressed weight of 450 pounds per cattle.


Per capita production figures of hog, cattle and sheep in New York State—minus New York City—between 1825 and 1860 were as follows: 1.013 hog, 1.045 cattle and 2.414 sheep in 1825; 0.815 hog, 0.989 cattle and 2.235 sheep in 1835; 0.898 hog, 0.903 cattle and 2.419 sheep in 1840; 0.709 hog, 0.928 cattle and 2.885 sheep in 1845; 0.394 hog, 0.727 cattle and 1.338 sheep in 1850; 0.377 hog, 0.742 cattle and 1.134 sheep in 1855; 0.297 hog, 0.643 cattle and 0.854 sheep in 1860; 0.347 hog, 0.587 cattle, and 1.778 sheep in 1865; and 0.151 hog, 0.594 cattle, and 0.634 sheep in 1870. Haines, *Health, Height, Nutrition, and Mortality: Evidence on The "Antebellum Puzzle" From Union Army Recruits in the Middle of the Nineteenth Century": 5, table 3.

Based on production figures from the federal censuses, Komlos puts total per capita meat consumption rates at 213 pounds in 1839, 194 pounds in 1849, 181 pounds in 1859, 130 pounds in 1869, and 161 pounds in 1879. His figures for per capita beef consumption are 79 pounds in 1839, 72 pounds in 1849, 73 pounds in 1859, 56 pounds in 1869, and 64 pounds in 1879. Komlos, "The Height and Weight of West Point Cadets: Dietary Change in Antebellum America": 909, 913.

Unfortunately, there are no direct data concerning per capita meat consumption in New York City after 1842. One exception, cited widely by historians, is an estimate available from an 1851 *New York Tribune* article, which claimed that members of an average working-class household ate about 146 pounds of butcher’s meat per year. It is hard to compare this figure to the more systematic data from between 1795 and 1818. Yet compared to the 160.4 pounds of per capita butcher’s meat consumption between 1795 and 1816, the figure of 146 pounds in 1851 does suggest a modest decline. Of course, this difference may simply refer to social inequalities, while its accuracy is hard to verify. *New York Tribune*, 1 January 1851. Cited by: Horowitz, Pilcher, and Watts, "Meat for the Multitudes: Market Culture in Paris, New York City, and Mexico City over the Long Nineteenth Century": 1066; Thomas David Beal, *Selling Gotham: The Retail Trade in New York City from the Public Market to Alexander T. Stewart's Marble Palace, 1625-1860* (Ph.D. dissertation, State University of New York at Stony Brook, 1998), 349-350; Horowitz, *Putting Meat on the American Table: Taste, Technology, Transformation*, 22.

In addition, the historian Richard Stott estimates that members of a working-class family ate between 219 to 255.5 pounds of meat per year during the 1850s and 1860s. These figures refer to all meats, not only fresh butcher’s meat, and hence it is impossible to compare them to my own estimates for the earlier period. Besides, there is some concern about the accuracy of the data. His figures put per capita beef consumption rates between 152 and 187 pounds, which simply cannot be correct. As Stott himself admits, these figures far exceed any recorded levels of beef consumption in American history. Richard Briggs Stott, *Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City* (Ithaca: Cornell University Press, 1990), 77.

The wholesale price of meat is given in the unit of a barrel: 200 pounds at the time. For Philadelphia, I use the relative prices of the average of mess and prime beef, and mess and prime pork, whereas for New York City, price quotations refer to mess beef and mess pork, and in Boston, for mess beef. The Boston figures are actually


63 Komlos also underlines that the price of meat relative to industrial goods increased even more sharply (by around 22%) between the 1820s and 1850s. Urban consumers faced an additional burden, as the prices of farm goods increased more rapidly than those of urban products. In Philadelphia, for example, meat prices relative to industrial products were 23.5% higher in the 1830s, 2% higher in the 1840s, and 40.6% higher in the 1850s than during the base period of the 1820s. Komlos, "The Height and Weight of West Point Cadets: Dietary Change in Antebellum America": 915-917; Komlos, "Shrinking in a Growing Economy? The Mystery of Physical Stature during the Industrial Revolution": 786.

64 For computing market revenues and expenditures from between 1821 and 1830, I relied on all relevant volumes of the Common Council proceedings. Between 1831 and 1858, data concerning market revenues are available on a yearly basis from the Annual Reports of the Comptroller. The reports of 1853 and 1858 tabulate market rents and fees for the entire period. Unfortunately, they do not provide information concerning premiums. For all missing or incomplete information, I referred back to the original annual reports for between 1830 and 1860. Common Council, *Minutes of the Common Council of the City of New York, 1784-1831*, Vol. 13: 451-458, 473-492; Vol. 14: 242-250; Vol. 15: 134-143; New York (N. Y.), Annual Report of the Comptroller, of the City of New York, of the Receipts and Expenditures of the Corporation, for the Year 1853 (New-York: 1854), 742; New York (N. Y.), Annual Report of the Comptroller of the City and County of New York, Exhibiting the Receipts and Expenditures of the City and County. Also, the Loans, Receipts and Reimbursements upon the Various Trust and Special Accounts for and during the Fiscal Year Ending December 31st, 1858 (New-York: 1854), 46-61.

65 For sources on population figures, see endnote 47. I decided to end the analysis of the market revenue data in 1849, because market fees in 1850 increased drastically from the previous year, suggesting that the city must have changed the amount of daily fees it collected from market vendors. As these rates are unknown, I was not able to convert the 1850 market fees into 1849 rates.


67 Ibid.

68 For a description of the sources used to calculate the number of butcher stalls, see endnote 49. For sources and methods of calculating population size annually, see endnote 47.


70 Four sources, see endnote 47.


72 Ibid., 38-111, 270-345.


They also added that abolishing the market laws is “calculated to subject the citizens to the frauds and imposition of the profligate and designing, without affording any adequate means of detection or exposure.”


I have entered into an access database the names of all butchers and their stalls listed in any of the sources I could identify from the 1790s until the 1850s. For the years of 1828 and 1838, I relied on De Voe’s manuscripts, while for 1818, I used the original City Council records. Four sources: De Voe, The Market Book: A History of the Public Markets of the City of New York; NYHS-MD: Thomas F. De Voe, “Ground Plans of the Public Markets in New York City, 1694-1866”; Thomas F. De Voe, “List of Butchers in the City with some Biographical Notes, 1656-

Duffy, A History of Public Health in New York City, 380-381.


For each year between 1832 and 1836, De Voe's manuscripts contain complete lists of all market butchers, including information concerning their stalls. De Voe, The Market Book: A History of the Public Markets of the City of New York; NYHS-MD: Thomas F. De Voe, "Ground Plans of the Public Markets in New York City, 1694-1866"; Thomas F. De Voe, "List of Butchers in the City with some Biographical Notes, 1656-1844"; Thomas F. De Voe, "New York City Markets Collection, ca. 1817 - ca. 1878", Boxes 1 & 2.


Ibid., 354-355, 369.


Ibid., 1845: 181, 172-183; 1846: 397-402.

CCFP (NYC-MA): "Joseph L. Frame's Proposal for Public Slaughter-houses", March 29, 1850, Special Committee on Slaughter-houses: 1850. See also related documents in the same folder.


Diseased meat "is sold in our markets by the quantity, and is extensively retailed in basements throughout the city. On Saturday nights our avenues and minor streets are traversed with wagons and hand carts laden with it." Ibid., 1855: 190-191; 1857: 195.


Data on crude death rates in 19th century American cities were compiled by Michael Haines. I would like to thank Michael Haines and Joseph P. Ferrie for giving me access to the data, which I use for Boston and Philadelphia. Michael R. Haines, "The Urban Mortality Transition in the United States, 1800-1940" National Bureau of Economic Research Historical Working Paper Series no. 134. For New York, I calculated the CDR myself. For the calculation of annual population figures, see endnote 47. Data on the total number of annual deaths come from: Rosenwaike, Population History of New York City, 176.

Meckel, "Immigration, Mortality, and Population Growth in Boston, 1840-1880".

Tangires, Public Markets and Civic Culture in Nineteenth-Century America, 40-42.

I have also entered into a spreadsheet figures for “dysentery” caused mortality. Dysentery caused death rates were high and fluctuated greatly during the 1810s and 1820s. From 1830, this volatility disappeared, and dysentery caused mortality reached a lower equilibrium until 1845. This suggests that by this time a medical consensus of some sort must have emerged about the diagnosis of the disease. In any case, from between 1830 and 1860 diarrhea and dysentery related mortality moved closely together, with a correlation coefficient of 0.76. This suggests that if there was any systematic confusion between the diagnoses of the two, this does not change the overall picture.


Ibid., 1861: 283, 283-298.

Ibid., 1860: 22.

Ibid., 1856: 208-209.

Ibid., 1860: 22.


Ibid., 1856: 208-209.


68


Ibid, 141-185.

For a detailed explanation of how the “market gravity area” maps were developed, see: Baics, "Feeding Gotham: A Social History of Urban Provisioning, 1780-1860,” 162-172 and footnotes. As for ward level base maps, and data on butcher rents and market fees, see endnote 47. The sources for ward level social indicators are: New York (State). Secretary's Office, Census of the State of New York for 1845. Containing an Enumeration of the Inhabitants of the State, with Other Statistical Information (Albany: Carroll & Cook, 1846), No. 29: 1-5; New York (State). State Secretary of, Census of the State of New York for 1855. Prepared from the Original Returns (Albany: C. Von Benthuysen, 1857); Moses Yale Beach, Wealth and Wealthy Citizens of New York City Comprising an Alphabetical Arrangement of Persons Estimated to Be Worth (New York: Sun Office, 1842), 19; Stott, Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City, 200, table 22.

The data compiled by Moses Beach are based on tax assessments, and hence they substantially underestimate the amount of personal wealth. As Stott underlines, their value is comparative only. Beach, Wealth and Wealthy Citizens of New York City Comprising an Alphabetical Arrangement of Persons Estimated to Be Worth; Pessen, "The Egalitarian Myth and the American Social Reality: Wealth, Mobility, and Equality in The "Era of the Common Man"": 993-995; Stott, Workers in the Metropolis: Class, Ethnicity, and Youth in Antebellum New York City, 200, endnote 8.


