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AFRICAN SLAVERY IN THE PRODUCTION OF SUBSISTENCE CROPS, THE CASE OF SÃO PAULO IN THE 19TH CENTURY

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The use of African slave labor in America has traditionally been associated with the production of commercial export crops, above all sugar, cotton, tobacco and coffee. Yet there was no regime where slaves were exclusively used for this activity, and even in the most export oriented of such plantations, some food crops were produced for home consumption and possibly for local market sales. But in few cases was this activity as important as in the slave economy of Brazil and above all in the newly expanding coffee plantations which were evolving in the region of São Paulo in the first half of the 19th century. It is this unusual concentration of expensive slave labor in basic food crop production that we will examine in this essay. The role of slave and non-slave labor in the production of such staples and the relationship of this staple production to the growing of commercial export crops of sugar and coffee will be explored through an analysis of the São Paulo regional economy in this period.

Before examining this evolution, it is essential to understand the regional diversity of this province. The regions of the province were well defined areas divided by a coastal mountain range (Serra do Mar), which separates a thin but fertile coast from a highland plateau, which in turn is defined by several river valleys and open plains. The "Litoral Region" extends approximately 400 kilometers and is dozens of kilometers wide. This was the first area occupied, but quickly lost its central position as settlement crossed the mountains. The first major interior plateau settlement was the town of São Paulo located on a natural route from the coast. Around the capital city grew several major agricultural regions, but the soils of this "Capital Region" were relatively poor compared to the virgin forested regions to the north, the south and the west - all of which became the major centers of export agriculture. To the south were increasingly open plains ideal for grazing - the so-called "Region of the Southern Road"- a route going south to the border with the Spanish colony of the Rio de la Plata. To the northeast of the Capital Region was the Paraíba Valley which extended into the northern border province of Rio de Janeiro. The Valley runs along the coast for some distance and is defined by the two mountain ranges, the Serra do Mar and the Serra da Mantiqueira. It was here that coffee had its beginnings, and its location close to the coast and to the mines of the interior of Minas Gerais also encouraged an active farming zone with several important counties producing a multiplicity of crops for export.

The "West Paulista" zone is due west and north of the Capital Region and remained mostly a forested frontier inhabited by Indians until the definitive penetration in

the age of the railroads. In this period the frontier had extended some 200 kilometers inland and incorporated the richest agricultural lands of the province. This region was first to be the home of a major sugar industry, and then the center of the coffee plantations after the mid 19th century. Even today, the West Paulista region is the single most important agricultural region of Brazil

The *paulista* rural economy through most of the period before 1800 had been based primarily on foodstuffs production for the home and internal market. Even after the growth of commercial sugar and coffee exports in this frontier region, the production of food staples remained a fundamental part of the economy and was also closely associated with the new export crops as well. From the earliest days, the dietary staples of corn, rice, and beans, and such meats as pork, were produced in every part of the province from the coast to the interior. There was also specialized production of such consumption items as tobacco, cane alcohol and herbal teas, and a minor grazing industry which raised cattle and horses. Animal products such as lard were also important everywhere. Grown on family farms - often with the aid of Indian slave labor - most of this production went for self consumption of the farm family, but over time more and more of the surplus was traded between regions and even beyond the borders of the province. This was especially the case in the period after 1700 when São Paulo became a major food producing region for the newly opened gold mines in the neighboring province of Minas Gerais ¹.

Recent historiography has begun to reveal the ongoing importance of local small farm staples production in the Brazilian context as a counterweight to the stress on the plantations in the traditional literature.² Such production in most areas was both for subsistence and for sale within local and regional markets. It always involved the family unit, but often included servants and slaves, and in the case of pre-18th century São Paulo, these were Indian slaves. This use of slave labor, at first Indian and then black, to produce these subsistence and local market goods has been one of the distinguishing features of Brazilian slavery. Few other American slave societies have made such systematic use of expensive slave labor in this area of production.

São Paulo is an especially good region to study this phenomenon. Initially without resources to enter the international economy and acquire the funds needed to import Africans, the paulistas were forced to find internal market solutions to overcome their international market disadvantages. The combination of Indian captures and exploration opened up markets for their subsistence crops and provided a crucial additional labor force beyond the family. The occupation of Minas Gerais led to an active regional market, with the paulistas supplying the transport animals and food essential to the mining economy. This market in turn was the major factor which permitted the paulistas to shift from ever more expensive and difficult to capture Indian slaves, to African slave labor brought across the Atlantic.

The progressive domination of the local slave market by Africans after 1700 actually meant more rather than less use of slaves in the production of food crops. Although African slaves were most drawn to the sugar mills that exported to the international markets after 1800, they were also employed in the production of food crops for the local and regional markets from the beginning to the end of slavery in the province.

Using previously unpublished provincial census and production data, this whole market evolution of food crops from 1798 onward can be examined in some detail (see table 1). Although sugar, even at this early date, accounted for two-thirds of all "exports" sold beyond the boundary of the county of production, a third was made up of these animal and subsistence products. In order of importance in terms of values came animals, cane alcohol, followed by the basic food products such as rice, beans, corn and manioc flour, and finally by lard. There was also strong regional variation in exports by products, with the animal and food products usually not coming from the sugar and coffee zones.

TABLE 1
RELATIVE IMPORTANCE AND REGIONAL DISTRIBUTION OF OF EXPORTS FROM SÃO PAULO IN 1798 (1)
I - % by product

<i>Regions</i>	<i>Sugar</i>	<i>Aguardte.</i>	<i>Cotton</i>	<i>Tobacco</i>	<i>Coffee</i>	<i>Food- stuffs (2)</i>	<i>Animals (3)</i>	<i>Lard</i>	<i>Total</i>
<i>Paraíba Valley</i>	29,3	5,5	8,8	15,6	0,9	0,5	9,9	29,5	100,0
<i>Capital Region</i>	13,0	41,5	2,2	0,2	0,0	14,4	0,5	28,1	100,0
<i>West Paulista</i>	91,6	1,4	0,5	0,2	0,0	0,8	4,4	1,1	100,0
<i>Southern Road</i>	0,7	5,5	0,0	1,3	0,4	24,9	66,0	1,2	100,0
<i>Coast</i>	78,3	9,8	0,0	1,0	3,3	7,6	0,0	0,0	100,0
Total	68,3	7,8	1,0	1,5	0,9	5,9	9,3	5,3	100,0

II - % by region									
<i>Paraíba Valley</i>	2,8	4,6	55,5	69,3	6,6	0,5	7	36,7	6,6
<i>Capital Region</i>	1,8	50,9	20,3	1	0	23,2	0,6	50,8	9,6
<i>West Paulista</i>	69,5	9,4	24,1	6,6	2,9	7,3	24,5	10,3	51,9
<i>Southern Road</i>	0,1	6,8	0	8,3	4,3	40,1	68	2,2	9,6
<i>Coast</i>	25,7	28,3	0	14,8	86,2	28,9	0	0	22,5
Total	100	100	100	100	100	100	100	100	100

Source: Armenio de Souza Rangel, "Economia e riqueza - Formação da economia cafeeira no Município de Taubaté - 1765/1835," (Ph.D. diss, FEA, Universidade de São Paulo, 1990), pp. 108,364.
The author used "mapas" on exports in the AESP for the year of 1798.

Notes: (1) Sales realized outside the municípios.
(2) Rice, Beans, Manioc and Corn
(3) Cows, horses and mules

The export data, however, probably underestimates the value of food crop production. In the published Müller census of 1836, corn production alone represented

a third of the value of all goods produced, exceeding even sugar and coffee that were the dominant long distance exports. Corn and the other food crops produced for self consumption or local sales were distributed unevenly across the province. Corn itself was most grown in the regions of the Paraíba Valley, the Southern Road and the West Paulista plains , but was absent from the coast. Beans were also grown everywhere but on the coast. In contrast, rice was a major product of the coast but also produced in the Paraíba Valley. Thus even in the zones with the biggest sugar and coffee exports there was significant production of animals and food crops. In the Valley of Paraíba, for example, tobacco, cotton, corn, rice, manioc flour, and cane alcohol was produced. The same diversity of such products were also to be found in the West Paulista region (see table 2). Thus even the most important sugar and coffee regions were not mono-crop areas. Only the herbal tea *erva mate* was totally concentrated in one region - that of the Southern Road.

TABLE 2
RELATIVE IMPORTANCE AND REGIONAL DISTRIBUTION OF SELECTED
AGRICULTURAL COMMODITIES GROWN IN SÃO PAULO IN 1836 (1)

	<i>Relative Importance of</i>				
<i>% of Production Value</i>	<i>Coffee</i>	<i>Sugar</i>	<i>Tobacco</i>	<i>Cotton</i>	<i>Aguardente</i>
	17%	13%	0%	0%	3%
% by Region					
<i>Paraíba Valley</i>	70,2	0,7	43,7	13,4	20,5
<i>Capital Region</i>	12,3	0,1	3,8	56,1	11,7
<i>West Paulista</i>	2,9	96,8	33,1	20,8	42,6
<i>Southern Road</i>	0,2	1,5	14,9	9,7	15,3
<i>Coast</i>	14,4	1,0	4,4	0,0	9,9
<i>Total</i>	100,0	100,0	100,0	100,0	100,0

<i>% of Production Value</i>	<i>Corn</i>	<i>Rice</i>	<i>Beans</i>	<i>Manioc Fl</i>	<i>Lard</i>
	36%	9%	3%	1%	1%

% by Region					
<i>Paraíba Valley</i>	11,0	41,2	35,5	34,1	73,2
<i>Capital Region</i>	16,7	3,9	18,1	20,4	0,0
<i>West Paulista</i>	45,8	9,3	31,5	5,5	0,0
<i>Southern Road</i>	26,5	5,2	14,6	21,7	26,8
<i>Coast</i>	0,0	40,3	0,4	18,2	0,0
<i>Total</i>	100,0	100,0	100,0	100,0	100,0

<i>% of Production Value</i>	<i>Cows</i>	<i>Pigs</i>	<i>Horses</i>	<i>Mules</i>	<i>Sheep</i>
	6%	6%	3%	2%	0%

% by Region					
<i>Paraíba Valley</i>	6,1	16,1	4,6	12,5	11,1
<i>Capital Region</i>	6,0	16,5	16,4	25,4	8,8
<i>West Paulista</i>	35,2	63,2	34,8	26,4	35,6
<i>Southern Road</i>	52,7	4,3	44,2	35,8	44,5
<i>Coast</i>	0,0	0,0	0,0	0,0	0,0
<i>Total</i>	100,0	100,0	100,0	100,0	100,0

Notes: These are the most important products of the region which represent 96% of all agricultural production during this year

It is important to note that the expansion of these food crops was related to the dynamics of the two principal commercial export crops, sugar and coffee. The expansion of the economy was begun by sugar in the third quarter of the 18th century and complemented by coffee commercial production beginning in the second decade of the 19th century. Market conditions, including prices, as well as the production process itself, especially in coffee, provided the basic stimulus for the expansion of these two products, which in turn fomented slave importations and the other internal economic activities, including food production. Local food producers began selling their output to other regions, such as Rio de Janeiro, as well as to the expanding free and slave population of the province itself. It is also important to realize that the two export crops of sugar and coffee presented characteristics which differed from corn, rice, beans and even cotton production, in that they were perennial rather than annual crops. Coffee depended on a very long lead time for initial production, while sugar required large capital investments. These two crops, being of greater risk than the annual food crops, were less influenced by normal price fluctuations, which could stimulate rapid changes in local food production. The long term trend in prices, however, did influence cycles of investment in these two commercial export crops, but did not influence production or the movement of workers into food crops. The production of sugar and coffee were relatively stable over time, with annual fluctuations more influenced by climactic factors. In the phases of very accelerated price rises there was a major stimulation of new investments, which encouraged new slave importations and eventually encouraged the transfer of labor from food to export production. Given that the export crops were relatively permanent, only a profound crisis, in which the producers definitively retired from this activity, would have led to a transfer of labor from sugar and coffee to food production. Nevertheless, this does not signify that there was not a movement of labor during the agricultural year into more than one crop. Taking advantage of the different timings of labor needs in the production of coffee and sugar, planters often shifted labor into the production of other crops during fallow periods, which explains why these export producers were also important producers of food crops. In the case of coffee this alternation between food crops and export production was fundamental in the initial development of coffee. Since coffee only began to give results after five years, in this initial phase the producers were able to maintain themselves through food production and the raising of animals for sale. This integration between export and food crops in coffee fazendas only disappeared in the second half of the 19th century, when the great producers of coffee reached a scale of activity completely different from that which we find in this period.

But the 1836 census of Müller also shows the relative unimportance of these products outside the province. Coffee and sugar together accounted for 80% of the value of external provincial exports. Of the remaining values, rice, *erva mate*, tobacco and lard were the most important, though corn and all the other food products were also exported (see table 3).

TABLE 3
VOLUME AND RELATIVE IMPORTANCE OF AGRICULTURAL EXPORTS
FROM SÃO PAULO IN 1836

<u>Products</u>	<i>Value Exported</i>	<i>% of Value</i>	<i>Quantity Exported</i> <i>(in arrobas)</i>
Coffee in tons	18.378	40,1	621.826
Sugar in tons	17.379	37,9	998.123
Rice in tons	6.878	9,1	69.868
<i>Erva mate in arrobas</i>	169.607	5,4	84.768
<i>Tobacco in Rolls</i>	136.268	4,4	33.705
<i>Lard in arrobas</i>	68.565	2,2	25.207
Beans in tons	316	0,3	5.196
<i>Manioc Flour in alqueires</i>	11.761	0,4	8.269
<i>Aguardente in casks (pipas)</i>	1.760	0,1	44
<i>Corn in alqueires</i>	689	0,0	816
<i>Other products</i>		0,1	2.126
Total Value	431.602	100,0	1.849.947

Source: Müller (1978).

Using the censuses of 1804 and 1829³, we get some detail about the nature of these food crop farms and a rough picture of the changing importance of all the economic activities geared to the local market. What is impressive is how universal was food production. In 1804 farms dedicated to the internal market absorbed some 86% of the agricultural slave owners and they controlled 70% of the slaves in this sector. Even as late as 1829, some three-quarters of the agricultural slave owners dedicated themselves to producing for the internal market and their slaves represented about half the servile labor force working in agriculture. In this same year, if we were to include all rural and non-rural slave owners, those dedicated to their internal market still made up half the slave owners and controlled 40% of the slave labor force.

As was to be expected, most of the food farms contained no slaves and were run by the families that owned them. Nevertheless the weight of slaves and slave owners in this sector is impressive. Close to a quarter of the food producing households contained slaves, though the distributions were quite skewed. There was a very large number of farmers with just one slave - they represented a quarter of these food

producing farmers who owned slaves. These one slave owning units were probably quite similar to the family run farms, and in fact most of the work was probably done by the family members in these same farms, and thus these small slave owners looked a great deal like the non-slave owning farmers. In 1804, for example a fourth of the farmers with one slave were mulattos or blacks, whereas such non-whites were relatively insignificant among those owning more than one slave. Among the non-slave owning food producers, mulattos represented a quarter of the farmers. However in general, slave owners tended to be older and far more foreign born than non-slave owners, even among the one-slave owning group. There were a high ratio of Portuguese and other Europeans among the slave owning farmers, though less than there were among the slave owning coffee and sugar exporters. In fact these Portuguese tended to be among the richest in terms of slave holdings. (see Table 4).

TABLE 4
CHARACTERISTICS OF FARMS AND FARMERS PRODUCING FOR THE INTERNAL MARKET IN SÃO PAULO

	1804		1829		1804	1829
	<i>With Slaves</i>	<i>Without Slaves</i>	<i>With Slaves</i>	<i>Without Slaves</i>	<i>Farms with 1 Slave</i>	
	(1)	(2)	(1)	(2)	(3)	(3)
% of Farmers producing for the Internal Market in Agriculture						
- % of Heads of Households	86%		74%			
- % of Slaves	70%		49%			
Slave Owners						
% farmers with slaves	24%		25%			
Average Number of Slaves	5		6			
Standard Deviation	6,8		7,2			
Median	3		3			
Mode	1		1			
Gini of Distribution of Slaves Among Owners	0,52		0,52			
% of Slave Owners by Size of Holding						
1 slave	25%		24%			
1-5 slaves	70%		67%			
6-10 slaves	18%		19%			
11-20 slaves	9%		10%			
21-40 slaves	2%		3%			
More than 40 slaves	1%		1%			
% of Slaves by Size of Holding						
1 slave	5%		4%			
1-5 slaves	32%		29%			
6-10 slaves	25%		25%			
11-20 slaves	24%		26%			
21-40 slaves	11%		14%			
More than 40 slaves	7%		7%			
Demographic Characteristics of Heads of Household of Those Producing for the Internal Market						
SEX						
% of males	79%	78%	80%	80%	79%	81%
COLOR						
% White	96%	64%	97%	73%	76%	90%
% Mulattos	4%	35%	3%	25%	23%	10%
% Blacks	0%	1%	0%	1%	2%	1%
AGE OF MALE						
% between 0-29 years of age	13%	27%	13%	28%	21%	22%
% between 30-49 years of age	45%	47%	47%	48%	47%	51%
% 50 years of age and older	42%	26%	40%	24%	32%	27%
AGE OF FEMALE						
% between 0-29 years of age	3%	6%	3%	6%	9%	9%
% between 30-49 years of age	32%	46%	33%	50%	41%	43%
% 50 years of age and older	65%	47%	64%	44%	50%	48%
MARITAL STATES OF MALE						
% single	7%	3%	7%	2%	8%	14%
% married	85%	92%	85%	93%	85%	80%
% widowed	7%	5%	8%	5%	6%	6%
MARITAL STATUS OF FEMALE						
% single	15%	25%	15%	19%	32%	27%
% married	4%	8%	5%	5%	7%	11%
% widowed	81%	67%	79%	75%	61%	62%
ORIGIN						
% from São Paulo	87%	98%	90%	92%	92%	86%
% from Minas Gerais	5%	1%	4%	1%	2%	5%
% from Other Provinces	3%	1%	2%	7%	3%	4%
% from Portugal e outros europeus	5%	0%	4%	1%	3%	6%

Source: "Listas Nominativas dos Habitantes", Arquivo do Estado de São Paulo

Notes: (1) Group of 41 different localities

(2) Group of 20 different localities

(3) Group of 41 different localities used for data for those owning one slave

Unlike coffee and sugar producing slave owners, those slave owners who produced food crops tended to be small holders of slaves. Those who held 5 slaves or less in this sector represented two-thirds of such slave owning agriculturalists. There were of course a few large slave owners who held a disproportionate ratio of slaves, but on the whole 80% of the slaves working in food production were on units of less than 20 slaves and the Gini index of inequality among all slave owners in this area was a relatively low .52.

A more detailed examination of the structure of production in this sector can be obtained by a study of two typical food producing counties, as well as the market for the three basic staples of corn, rice and beans. The two counties we have selected are Jacareí and Cunha, both located in the Valley of Paraíba. The former produced numerous food and animal products for consumption in the market of the city of São Paulo and the capital city of Rio de Janeiro; and the second was primarily producing corn as well as basic food crops also for the Rio de Janeiro market. Cunha is an especially interesting case since it was a major agricultural center with a very important slave labor force which never became a major coffee or sugar producer.

In the first thirty years of the 19th century export crops made up less than 5% of production in the county of Cunha. Rather a changing variety of food crops sustained the local economy, with corn and pigs - and their product lard - being always major factors in the local farming scene. In 1835, for example, Cunha produced 2,600 tons of corn, 177 tons of beans, 133 tons of lard (or *toucinho*), as well as significant quantities of rice and tobacco.⁴ The total value of food and animal production for the internal market reached 81,000 mil réis in this year and represented almost the total value of production in the county of Cunha.⁵

The market orientation of the Cunha food producers enabled them to make intensive use of slave labor in producing these products. Most of the farmers without slaves probably dedicated more of their surplus to subsistence. - few of these non-slave owners listed output for sale and most often registered that they "*plantava para seu sustento*," that is that they produced only for their own subsistence. Slave owners with more than 10 slaves in Cunha produced two-thirds of the corn, pigs and lard that were marketed. Almost a third of production came from the farms which owned 20 or more slaves (see table 5).

TABLE 5
PROFILE OF AGRICULTURAL ACTIVITY AND SLAVE USE IN SELECTED
PRODUCTS, CUNHA, 1804-1836

A: Quantity, Value and Relative Importance of Output & Exports:

Quantity Produced	1804	1810	1816	1823	1835
<i>Sugar in tons</i>	10				
<i>Coffee in tons</i>					1
<i>Tobacco in tons</i>	1				8
<i>Corn in tons</i>	503	7		13	2586
<i>Corn in cavalos</i>			23968	11690	
<i>Rice in tons</i>	7		11	8	34
<i>Beans in tons</i>	44		71	33	177
<i>Lard in tons</i>	70	189			133
<i>Pigs (1)</i>	368	440	3767	2024	
<i>Piglets Leitões</i>			2592	689	
Value of Production (in mil réis)	25478	15256	19144	8632	80663

Percentage of Total Value (2)

Export Products

<i>Coffee & Sugar</i>	2,8%	0%	0%	0%	0,1%
<i>Tobacco & Cotton</i>	0,3%	0%	0%	0%	0,9%
<i>Food Crops & Animals</i>					
<i>Cereals & Manioc</i>	23,8%	0,3%	8,9%	16,6%	74,5%
<i>Lard</i>	32%	84%	0%	0%	23%
<i>Animals</i>	40,9%	15,6%	91,1%	83,4%	2,0%

Percentage of Production by Slave Owning Households

<i>Corn tons</i>	98%	87%			94%
<i>Corn "cavalos" (3)</i>			99%	100%	
<i>Lard in arrobas</i>	97%	99%			98%
<i>Pigs</i>	100%	100%	100%	99%	

B: Slave Use in the Production of Selected Foodstuffs:

Participation of Slave Households by Size of Holding (production)

Corn

1 - 5 slaves	11%		7%	5%	19%
6-10 slaves	21%		28%	11%	14%
11-20 slaves	16%		17%	43%	47%
21-40 slaves	45%		40%	33%	13%
41+ slaves	6%		8%	8%	6%

Lard

1 - 5 slaves	33%	25%			19%
6-10 slaves	19%	14%			14%
11-20 slaves	19%	17%			44%
21-40 slaves	29%	35%			20%
41+ slaves		9%			3%

Pigs

1 - 5 slaves	5%		14%	7%	
6-10 slaves	13%	18%	26%	29%	
11-20 slaves	21%	48%	24%	39%	
21-40 slaves	43%	34%	29%	17%	
41+ slaves	19%		6%	7%	

Source: Same as Table 4.

- Notes: (1) Some of the pig output was listed in arrobas and these have been converted into units by estimating 5 arrobas per animal. In 1804 production was listed at 1,539 arrobas of swine, which corresponds to 309 animals.
- (2) For prices and conversion rates used for weights and measures, see Francisco Vidal Luna & Herbert S. Klein, "Nota a respeito de medidas para grãos utilizados no período colonial e as dificuldades para sua conversão ao sistema métrico," and "Observações a respeito dos preços agrícolas em São Paulo (1798/1836)," both of which appeared in the *Boletim de História Demográfica*, Ano VIII, no. 21 (Março 2001) - [São Paulo].
- (3) We could not find a conversion rate for "cavalos de milho", which makes it impossible to calculate the total value of corn in the years of 1816 & 1823. Given the importance of corn in total output, and our inability to estimate total corn productions figures, then both corn and total production is underestimated in these two years.

What is impressive about these results is that Cunha was able to sustain and add to a major slave labor force on the basis wealth generated from traditional food crops. In contrast to Areias and Jundiaí, where coffee and sugar provided the income to purchase slaves and where food production was a supplement to these export crops, in Cunha it was only these very traditional food crops that served as the basis of the economy. This view from the censuses is confirmed by the 19th century French traveler Saint-Hilaire who visited Cunha and affirmed that in this county there were no sugar or coffee, but a very large production of corn and other food products destined for the market in Rio de Janeiro, which was shipped through the port of Parati.⁶

Approximately two-thirds of the households in Cunha were dedicated to agriculture, a figure one would expect from this type of county. But what is truly unusual about Cunha, aside from the type of goods it produced, was the very impressive penetration of slaves in this county. An astonishing half to 80% (depending on the census year) of the households in farming owned slaves - an extraordinarily high level by the standards of Brazil; and agriculturalists controlled more than 80% of the slaves owned in the county (see table 6). In fact half the total population were slaves in Cunha - some 1,500 out of some 3,000 persons - also an unusually high ratio by local standards.

Although Cunha had a large minority of poor households, the fact that slavery was so widely distributed meant that the Gini indices of inequality were quite low by 19th century standards. Among slave owning households the Gini was .50 and even when all households are included it varies from 0.75 to 0.80; low compared to other areas in contemporary São Paulo. This did not mean that there were no large owners, but rather that slaves was very widely distributed and most owners held close to the average number of slaves. Cunha in fact had slave owners who held between 60 and 70 slaves, a figure not insignificant even in the coffee and sugar zones. Unusual as well was the fact that the slaves were predominantly African. Some 50% of the servile labor force in the county were born in Africa, again a number quite comparable to the most advanced sugar and coffee counties. Given their origin, the sex ratio among the slaves was consistently above 160 males per 100 females and the average age was between 24 and 26 years (see table 7). This stability of the labor force was matched by a stability of total population and the ratio of slave owners over time. Clearly from early in the century Cunha had become a thriving center of production for the internal market and it maintained its markets and its labor force and continued to grow, in the midst of a province ever more committed to sugar and coffee exports.

Table 6
PROFILE OF SLAVES AND SLAVE OWNERSHIP IN CUNHA, 1804--1835

Population & Households	1804	1810	1816	1823	1829	1835
<i>Number of Inhabitants</i>	2887	2781	3018	2860	3375	2574
<i>Number of Slaves</i>	1331	1318	1410	1271	1549	1046
<i>Number of Free Persons</i>	1.556	1.463	1.608	1.589	1.826	1.528
<i>Number of Slave Owners</i>	189	183	185	165	189	132
<i>% Slaves in Population</i>	46%	47%	47%	44%	46%	41%
<i>Number of Households</i>	346	348	368	346	407	373
<i>% of Households with Slaves</i>	55%	53%	50%	48%	46%	35%
<i>% "poor"/total hshlds</i>	5%	7%	4%	28%	5%	12%

Statistical Indicators of Slave Ownership

<i>Average Slave Owned</i>	7	7	8	8	8	8
<i>Std.dev.</i>	7,8	8,6	8,8	9,1	9,1	9,6
<i>Median Slaves Owned</i>	4	4	5	5	6	5
<i>Modal Slaves Owned</i>	1	1	1	1	1	2
<i>GINI for Slave Owners</i>	0,52	0,52	0,50	0,51	0,50	0,53
<i>Gini for Hds Household</i>	0,74	0,75	0,75	0,77	0,77	0,83
<i>Largest Owners (n.of slaves)</i>	49	64	64	72	74	67

<i>Slaves in Agriculture</i>	1128	1111	1210	995	1317	848
<i>% of slaves</i>	88%	87%	86%	83%	85%	82%
<i>Slave-owners</i>	153	140	148	107	149	101
<i>Average slaves on farms</i>	7	8	8	9	9	8
<i>% of Households in Agriculture</i>	79%	63%	62%	50%	56%	60%
<i>Slaves in Other Activities (1)</i>	161	170	195	199	224	183
<i>Slave-owners in Other Activities (1)</i>	30	36	33	28	37	29
<i>Average Slaves in other Activities</i>	5	5	6	7	6	6

Characteristics of the Slaves

<i>% Africans</i>	42%	51%	51%	53%	55%	21%
<i>Sex Ratio</i>	158	159	170	164	168	160
<i>Average Age</i>	25	26	24	25	26	26

Source: Same as table 4

Notes: (1) This includes artisans, merchants, liberal professionals, public officials, transport workers and rentier persons.

The county of Jacareí, founded in 1652, was also located in the Valley of Paraíba, but at the southern end, just 90 kilometers from the capital. Like Cunha, it was essentially dedicated to production for the internal market, but at the end of the 1820s it also began to produce small amounts of coffee. Though its primary market was the capital of the province, there is some indications that it also shipped part of its surplus to Rio de Janeiro.⁷ In the early 19th century Jacareí was in a phase of rapid expansion. Between 1804 and 1829 the value of its output grew six times to 68,350 mil réis, and in the later year it produced 1,962 tons of corn.⁸

But Jacareí was more than just a corn producer. In 1829 it also grew rice (192 tons) and beans (215 tons), along with 241 tons of coffee. Coffee production was growing, though even as late as 1836, its output was less than half of what Areias - the leading coffee county in the province - was producing (see table 7). Despite this coffee output Jacareí remained primarily a food producer for the internal market. The corn producers, for example, held a large ratio of the local slave labor force and in 1829, more than half these producers owned slaves. By this date close to half the production of corn and beans occurred in households with slaves, and a third of the output was produced in units which held more than 20 slaves. The big difference of this county from Cunha, was that these food crops were also produced in coffee estates. Coffee plantations produced about a third of the crops for the internal market.⁹ The experience here, was probably quite similar to that of Areias, in that corn and other food crop producers slowly got in to coffee production and while their trees were maturing (taking up to four years to produce their first beans), continued to maintain themselves through traditional exports.

TABLE 7
PROFILE OF AGRICULTURAL ACTIVITY AND SLAVE USE IN
SELECTED PRODUCTS, JACAREI (1804-1829)

A: Quantity, Value and Relative Importance of Output & Exports:

Quantity Produced	1804	1829
<i>Sugar in tons</i>	0,1	1
<i>Coffee in tons</i>		241
<i>Tobacco in tons</i>	0,2	13
<i>Cotton in tons</i>	21	13
<i>Peanuts in alqueires</i>	34	21
<i>Corn in tons (1)</i>	590	1962
<i>Rice in Tons</i>	21	192
<i>Beans in tons</i>	81	215
<i>Aguardente in canadas</i>	673	323
<i>Sugar Cane in cargas</i>	10	
<i>Brown Sugar in units</i>	6100	
<i>Flour in alqueires</i>	30	
<i>Pigs</i>	194	450
Value of Production (in mil réis) (2)	11277	68350
Percentage of Total Value		
Coffee		50%
Tobacco & Cotton	13%	1%
Food Crops & Animals		
Corn	52%	31%
Cerials & Manioc		
Aguardente	12%	1%
Animals	5%	3%

Percentage of Production by Slave Owning Households

<i>Corn</i>	30%	58%
<i>Coffee</i>		93%
<i>Beans</i>	35%	41%

B: Slave Use in the Production of Selected Foodstuffs:

Participation of Slave Households by Size of Holding (production)

Coffee

1 - 5 slaves	13%	15%
6-10 slaves	15%	19%
11-20 slaves	23%	12%
21-40 slaves	13%	21%
41+ slaves	35%	33%

Corn

1 - 5 slaves	49%	28%
6-10 slaves	19%	18%
11-20 slaves	9%	18%
21-40 slaves		23%
41+ slaves		13%

Beans

1 - 5 slaves	64%	36%
6-10 slaves	23%	19%
11-20 slaves	13%	15%
21-40 slaves		17%
41+ slaves		13%

Source: Same as table 4

Notes (1) All "cargas" of corn converted into alqueires at 2 to 1 ratio.

(2) All prices come from table 5. We could find no prices for either peanuts or brown sugar. For metric conversion rates see conversion notes in table 5.

Jacareí also differed from Cunha in its ratio of slave laborers in agriculture. Whereas it was similar in having 80% of the households of the county dedicated to agriculture, less than 20% of these agricultural households possessed slaves. Clearly a lot more of the food producers worked with only free workers, most of whom were members of their immediate family. Moreover they held on average fewer slaves than their Cunha counterparts. In Jacareí the average of slaves in the exclusively food producing sector by 1829 was only 3 per farm, compared to 12 slaves per coffee unit. Also given the impact of coffee, the county held more Africans among its 1,298 slaves than did Cunha. By 1829, Africans represented two thirds of the slave labor force. (see tables 8).

To better examine this sector of the economy we will now study each of the major food products. To do this we have added to the counties analyzed above several other typical food producing counties (or municípios). Our aim is to see how these crops were produced, by whom and if there were any changes over time. Among the eight different counties investigated. some were deeply involved in the production of sugar like Itu, Capivari, Campinas and Mogi Mirim; or coffee like Areias, and others like Cunha and Jacareí, were much more involved in crops for the internal market.

Of all the crops consumed and produced for the local market, none was as ubiquitous or important as corn. This was a food consumed by humans and animals and as such was essential to the local economy. As the visiting German military officer Friedrich von Weech noted, corn was as important in the temperate zones of Brazil as manioc was in the more tropical zones. He noted that corn was “ground in mills until it is a very fine flour (called *fuba*) and is then boiled in hot water (*angu*), or dry, is an extremely nutritious food, completely replacing bread. To make bread with this corn flour, one mixes it with some wheat flour.”¹⁰

Table 8
PROFILE OF SLAVES AND SLAVE OWNERSHIP IN JACAREI,
1777, 1804, 1829

<i>Population & Households</i>	<i>1777</i>	<i>1804</i>	<i>1829</i>
<i>Number of Inhabitants</i>	4099	5154	6882
<i>Number of Slaves</i>	305	494	1298
<i>Number of Free Persons</i>	3794	4.660	5.584
<i>Number of Slave Owners</i>	104	135	232
<i>% Slaves in Population</i>	7%	10%	19%
<i>Number of Households</i>	772	971	1355
<i>Number of Hshlds with Slaves</i>	104	135	232
<i>% of hshlds with Slaves</i>	13%	14%	17%
<i>Number of "poor" hshlds</i>		111	10
<i>% "poor"/total hshlds</i>		11%	1%
<i>Statistical Indicators of Slave Ownership</i>			
<i>Average Slaves Owned</i>	3	4	6
<i>Std.dev.</i>	2,5	4,2	8,9
<i>Median</i>	2	2	3
<i>Modal Slaves Owned</i>	1	1	1
<i>GINI for Slave Owners</i>	0,43	0,48	0,57
<i>Ginit for Hds Household</i>	0,92	0,93	0,93
<i>Largest Owners (n.of slaves)</i>	12	33	66
<i>Slaves in Agriculture</i>		371	1154
<i>% of Slaves</i>		81%	90%
<i>Slave-owners in Agriculture</i>		96	180
<i>Average slaves on farms</i>		4	6
<i>% of Households in Agriculture</i>		80%	85%
<i>Slaves in Other Activities</i>		87	132
<i>Slave-owners in Other Activities</i>		30	45
<i>Average Slaves in other Activities</i>		3	3
<i>Characteristics of the Slaves</i>			
<i>% Africans</i>		30%	63%
<i>Sex Ratio</i>	94	94	155
<i>Average Age</i>	27	23	23

Source: Same as table 4

Corn at the same time was served as subsistence to family producers, or commercialized either directly to the market or as sales for animal feed. It was fed to pigs and thus used in the creation of lard, another important provincial product, and it was a basic feed for the mules vital to the transport network.¹¹ As we have already noted in the study of coffee and sugar fazendas, corn was produced both on farms exclusively dedicated to its production as well as being a byproduct on many plantations producing an export crop like coffee and sugar.

In 1836 Müller estimated that the value of corn production in São Paulo represented a third of the total value of agricultural production (see table 1). Areias and Jundiaí clearly demonstrate a secular trend upward of growth in total product, average production, and average slave per producer over time. Both also show the decline of non-slave and smaller producers. In Jundiaí for example, corn producers who owned no slaves dropped from accounting for 40% of corn production, to just 27% by 1836; in turn small slave owners (those who held 10 or fewer slaves) went from controlling over half of production to just 31%. The increasing concentration was also seen in size of output. With those producing 15 tons of corn declining from accounting for 80% of the corn harvest in the earliest period to less than two thirds in 1836. This concentration process was made possible by the rise in the average number of slave workers per producer, which doubled in this period.

The same process can be seen in Areias during this period. The participation of non-slave owners in the total harvest fell from 37% to 16% between 1817 and 1836. Small slave owners (those with 10 slaves or less) also went from accounting for over half to 37% of the crop, and dropped even further in 1836 to 29% of production. In turn smaller producers - those again accounting for 15 tons per annum or less dropped from producing over two-thirds of the crop to just over half of production. At the same time average slave holdings of Areias's corn producers went from 7 to 13 slaves in this same period.

It should be recalled that these two counties were major exporters of sugar and coffee respectively. Thus all farms and plantations in these regions were growing larger over time and squeezing out the smaller producers and those without slaves. Nevertheless, the growth in the farms which only produced corn also experienced this same pattern of increasing size, increasing domination of slave produced output and finally of ever larger producers. In Jundiaí, for example, the average output of producers of corn went from 2.4 tons per annum to 3.8 tons in 1836, while the average number of slaves held by corn producers went from 4 to 7 slaves. In Areias these same producers of just corn went from 1.7 to 2.7 tons and the average number of their slaves from 4 to 7 in this period.

The eight counties selected for our study of corn, together contained more than 2,000 farmers who produced 12,500 tons of this product (see tables 9 and 10). Some 40% of these producers had slaves and they accounted for 80% of total production. These slave owners averaged 11 tons per farm which was 6 times larger than the output on non-slave farms. Even among the slave-owning producers, the bigger owners produced the bulk of the corn. Those who owned 10 slaves or less accounted for over two thirds of the slave owners but produced only some 41% of output. In turn the largest slave owners accounted for half of total production, though they were just a fifth of the producers. Smaller producers (those whose output was three tons or less) though accounting for two-thirds of the farmers, accounted for only 13% of total production (see tables 11 and 12). Thus the growing tendencies for slave owning producers to control the harvesting of corn and increasingly larger producers and units to produce the largest share of that production was even more evident from this 8 county survey.

TABLE 9
CHARACTERISTICS OF CORN PRODUCTION IN EIGHT SÃO PAULO COUNTIES
1816, 1822, 1829, 1836

	<i>Jundiaí</i>	<i>Cunha (1)</i>	<i>Areias(2)</i>	<i>Itu</i>	<i>Capivari</i>	<i>Mogi Mirim</i>	<i>Jacarei (3)</i>	<i>Campinas</i>	<i>Total</i>
Quantity Produced (in tons) (1)									
1816	1.647	0	1.547	0	0	0	0	0	3.194
1822	1.123	13	1.527	0	0	0	0	0	2.663
1829	1.732	0	2.148	0	0	0	1.962	0	5.842
1836	2.420	2.586	1.233	2.357	1.118	749	389	1.708	12.559
Number of Producers									
1816	502		677						1179
1822	431	5	781						1217
1829	448		973				986		2407
1836	537	237	279	481	68	110	486	59	2257
Average Output per Producer (tons)									
1816	3,3		2,3						2,7
1822	2,6	2,7	2,0						2,2
1829	3,9		2,2				2,0		2,4
1836	4,5	10,9	4,4	4,9	16,4	6,8	0,8	28,9	5,6
Value (in mil reis)									
1816	16.897	0	15.865	0	0	0	0	0	32.762
1822	11.742	139	15.961	0	0	0	0	0	27.842
1829	18.562	0	23.023	0	0	0	21.034	0	62.619
1836	51.247	54.749	26.115	49.906	23.664	15.860	8.227	36.165	265.934

Source: Same as table 4

Notes (1) Corn production in Cunha in the years 1816 and 1823 was registered in "cavalos" - some 23,968 in former year and 11,690 in the latter one. Given our lack of a measure for conversion of this colonial m we have not incorporated these numbers in the table. See table 5 for conversion rates between pre and post-metric weights and also for the structure of prices used.

(2) Bananal was taken from Areias in 1832, and this affected production data in 1836

(3) The census for Jacarei in 1836 is incomplete

TABLE 10
CHARACTERISTICS OF PRODUCERS OF CORN IN RELATION TO SLAVE OWNERSHIP
IN EIGHT SÃO PAULO COUNTIES IN 1816, 1822, 1829 AND 1836

	<i>Jundiaí</i>	<i>Cunha (1)</i>	<i>Areias(2)</i>	<i>Itu</i>	<i>Capivari</i>	<i>Mogi Mirim</i>	<i>Jacarei (3)</i>	<i>Campinas</i>	<i>Total</i>
<i>Number of Producers with slaves</i>									
1816	137		218						355
1822	126	5	344						475
1829	164		459				163		786
1836	186	145	160	248	50	30	75	22	916
<i>Number of Slaves</i>									
1816	1.594		1.594						2.630
1822	3.110	133	3.110						4.360
1829	5.218		5.218				1107		8.056
1836	2.001	1343	2.001	3317	966	173	440	432	10.760
<i>Slaves per Slave Owners Growing Corn</i>									
1816	8		7						7
1822	9	27	9						9
1829	11		11				7		10
1836	11	9	13	13	19	6	6	20	12

Source: Same as table 4

These eight counties were among the most commercialized producers. But it should be stressed that corn was produced in all regions of the province. It was a crop easy to grow, which produced annually and required low capital investments. As the provincial economy expanded from export crops and regional trade, so to did total output of corn. Moreover, even the largest slave plantation produced some of its corn for subsistence to feed its own workers and cattle. As we saw with Areias, corn was an easily marketed crop and clearly was fundamental in sustaining the new coffee plantations until their trees began to produce after several years. Finally most of this product was probably marketed within the region it was produced, or at most in nearby markets. Demand for corn was constant everywhere and any shortfalls in local production were met by producers within the region or at most in the next region over.

TABLE 11
CHARACTERISTICS OF CORN PRODUCTION IN EIGHT SÃO PAULO COUNTIES IN 1836

1. Distribution of Producers by Size of Output (in tons)

	<i>0-3.0</i>	<i>3.0 - 7.5</i>	<i>7.5 - 15.0</i>	<i>15.0-30.0</i>	<i>30.0-60.0</i>	<i>60.0-100.0</i>	<i>100.0+</i>	<i>total</i>
<i>Quantity (tons)</i>	1319	2276	2012	1815	2534	1061	1541	12559
<i>Number of Producers</i>	1354	515	195	95	75	16	7	2257
<i>Number of Slaves</i>	1174	2350	2103	1874	2019	812	428	10760

2. Distribution of Producers without Slaves by Size of Output (in tons)

	<i>0-3.0</i>	<i>3.0 - 7.5</i>	<i>7.5 - 15.0</i>	<i>15.0-30.0</i>	<i>30.0-60.0</i>	<i>60.0-100.0</i>	<i>100.0+</i>	<i>total</i>
<i>Quantity (tons)</i>	994	840	308	48	33	0	151	2375
<i>Number of Producers</i>	1099	207	30	3	1	0	1	1341

3. Quantity of these producers by tons produced

	<i>0-3.0</i>	<i>3.0 - 7.5</i>	<i>7.5 - 15.0</i>	<i>15.0-30.0</i>	<i>30.0-60.0</i>	<i>60.0-100.0</i>	<i>100.0+</i>	<i>total</i>
<i>Quantity (tons)</i>	1112	1746	1315	1141	1481	468	1421	8684
<i>Number of Producers</i>	1144	402	127	59	45	7	6	1790
<i>Number of Slaves</i>	446	1083	704	755	631	141	328	4088

Source: Same as table 4 & 5 (for prices and conversion rates).

The same processes noted in the production of corn could also be found repeated in the production of rice (see table 13). Rice was also grown primarily in slave working farms and was even found on sugar and coffee fazendas. Our analysis of rice comes from these same eight counties. What is most evident from this data is that rice was rapidly expanding in most of these counties during the first third of the 19th century. Areias, for example, the largest rice producer of this 8 county sample, increased its production five times over from 1817 to 1829, and the number of producers almost tripped. Of these rice producers, half owned slaves, with a high average of 12 slaves per unit. Although 78% of rice production came from these slave owning farms many of which were export producers as well, each unit was a relatively small producer. Over three quarters of the producers generated less than 701 kilos and these most probably went for home consumption. Unfortunately the zone par excellence of rice exports in this period, the county Iguape, has no surviving data and therefore we can not outline the patterns in a zone which saw a major commercialization of the crop beyond the boundaries of the county.

TABLE 12
CHARACTERISTICS OF PRODUCERS OF CORN IN RELATION TO SLAVE OWNERSHIP
IN EIGHT SÃO PAULO COUNTIES IN 1836

1. Distribution of Producers by Size of Slave Holding

	<i>Number of Slaves</i>							<i>total</i>
	<i>No Slaves</i>	<i>With Slaves</i>	<i>1 to 5</i>	<i>6 to 10</i>	<i>11 to 20</i>	<i>21 to 40</i>	<i>41+</i>	
<i>Quantity (tons)</i>	2375	10184	2046	1220	2899	1571	2449	12559
<i>Number of Producers</i>	1341	916	453	151	177	85	50	2257
<i>Number of Slaves</i>		10760	1178	1168	2593	2408	3413	10760

2. Distribution of Producers who did not also produce Coffee & sugar by size of slave holding

	<i>Number of Slaves</i>							<i>total</i>
	<i>No Slaves</i>	<i>With Slaves</i>	<i>1 to 5</i>	<i>6 to 10</i>	<i>11 to 20</i>	<i>21 to 40</i>	<i>41+</i>	
<i>Quantity (tons)</i>	2220	6464	1750	929	2078	519	1188	8684
<i>Number of Producers</i>	1218	572	351	94	98	20	9	1790
<i>Number of Slaves</i>		4088	870	719	1361	517	621	4088

Source: Same as table 4 & 5 (for prices and conversion rates).

In 1836, these eight municípios had 1,200 producers of rice who harvested 652 tons in that year. Over half of rice producers owned slaves, with an average a relatively high of 13 slaves per farm, and they accounted for 80% of total production. As in the other crops we have examined, production was concentrated among the larger slave owning producers. Half of production in these eight counties occurred in units which had more than 10 slaves. The average slave owning producer grew four times as much rice as those who owned no slaves. Thus rice, like corn, a traditional food crop, was increasingly slave grown in the 19th century. But unlike corn, rice tended to be grown in non-specialized units among a host of other crops, including the major export crops of coffee and sugar, at least in these eight counties. As we have noted several times, especially in the case of sugar, the São Paulo producers were unusual in dedicating themselves to a variety of crops, many consumed both locally and regionally. In 1836 more than half of the rice production came from farms which also produced coffee and/or sugar. But even without these export producers it is evident that rice was increasingly a slave produced crop everywhere in the province. Considering just the three counties of Areias, Cunha and Jundiá, for which we have good data for the years from 1816 and 1836, producers who owned slaves expanded their weight in production from 60% to 87% . Clearly this increasing use of slaves to produce rice meant that it was increasingly a commercial crop in 19th century São Paulo.

TABLE 13
CHARACTERISTICS OF RICE PRODUCTION IN EIGHT SÃO PAULO COUNTIES,
1816, 1822, 1829, 1836

	<i>Jundiaí</i>	<i>Cunha</i>	<i>Areias</i>	<i>Itu</i>	<i>Capivari</i>	<i>Mogi Mirim</i>	<i>Jacarei</i>	<i>Campinas</i>	<i>TOTAL</i>
Quantity Produced (in tons) (1)									
1816	8	11	136						154
1822	14	8	407						429
1829	35		661				192		889
1836	61	34	300	74	34	62	62	26	652
Number of Producers of Rice (with and without slaves)									
1816	62	13	334						409
1822	54	10	514						578
1829	70		883				597		1550
1836	178	73	254	158	57	183	225	44	1172
Average Output per Producer (tons)									
1816	0,1	0,8	0,4						0,4
1822	0,3	0,8	0,8						0,7
1829	0,5		0,7				0,3		0,6
1836	0,3	0,5	1,2	0,5	0,6	0,3	0,3	0,6	0,6
Number of Producers with Slaves									
1816	33	13	131						177
1822	27	10	253						290
1829	56		440				130		626
1836	106	64	143	117	43	81	55	27	636
Number of Slaves									
1816	338	259	1098						1695
1822	417	138	2757						3312
1829	948		5087				994		7029
1836	1484	811	1874	1667	864	629	385	566	8280
Average Slave Holding									
1816	10	20	8						10
1822	15	14	11						11
1829	17		12				8		11
1836	14	13	13	14	20	8	7	21	13

Source: Same as table 4 & 5 (for prices e conversions).

Along with rice, beans were probably the most important food consumed in São Paulo from the beginning of colonization. Like rice and corn, bean production was to be found everywhere in the province and was produced on the lands of the poorest squatter to the most capitalized planter. It was normal to find beans produced on ranches as well as sugar plantation. In Jundiaí there were a relatively stable 300 bean growing farmers in the various census years (see table 14). Of these, approximately 40% owned slaves and these slave owning farmers accounted for some 80% of the

beans produced. The average slave owning farm in bean production possessed between 8 to 13 slaves, and grew eight times as much as those with no slaves. No farmer grew more than 10 tons per year and the overwhelming majority of producers grew less than 700 kilos. Smaller producers in fact accounted for 40% of total output.¹²

TABLE 14
CHARACTERISTICS OF BEAN PRODUCTION IN EIGHT SÃO PAULO COUNTIES
1816, 1822, 1829, 1836

	<i>Jundiaí</i>	<i>Cunha</i>	<i>Areias</i>	<i>Itu</i>	<i>Capivari</i>	<i>Mogi Mirim</i>	<i>Jacareí</i>	<i>Campinas</i>	<i>TOTAL</i>
Quantity Produced (in tons) (1)									
1816	127	71	223						421
1822	130	33	550						713
1829	154		367				215		736
1836	167	177	267	314	131	112	115	111	1394
Number of Producers of Beans (with and without slaves)									
1816	336	46	615						997
1822	271	23	663						957
1829	291		783				908		1982
1836	365	231	263	358	66	244	449	50	2026
Average output per Producer (tons)									
1816	0,4	1,5	0,4						0,4
1822	0,5	1,4	0,8						0,7
1829	0,5		0,5				0,2		0,4
1836	0,5	0,8	1,0	0,9	2,0	0,5	0,3	2,2	0,7
Number of Producers of Beans (with slaves)									
1816	127	42	205						374
1822	117	22	331						470
1829	148		423				151		722
1836	159	144	151	222	51	98	76	31	932
Number of Slaves									
1816	998	536	1539						3073
1822	1075	401	3104						4580
1829	1703		5061				1070		7834
1836	2012	1350	1934	3344	977	769	444	756	11586
Average Slave Holding									
1816	8	13	8						8
1822	9	18	9						10
1829	12		12				7		11
1836	13	9	13	15	19	8	6	24	12

Source: Same as table 4 & 5 (for prices and conversions).

For the 8 counties combined in 1836 there were more than 2,000 farms growing beans of which close to half used slaves and these accounted for 84% of production. Here the average farm yielded six times as much as those without slaves. The large

slave owners (with more than 10 slaves) accounted for 70% of slave produced beans and 60% of the total crop. The average slave holding of these bean producers was again a rather high 12 slaves per farm in 1836, suggesting a multi-crop environment including some export crops.

If corn, rice and beans formed the staple of human life, it was corn which was fundamental to the creation of pork and of its most important byproduct - lard.. From the earliest export statistics and the earliest travelers accounts, lard was listed as a principal export from the province, being used universally in cooking and as a fundamental grease, As one early 19th century traveler noted:

In the provinces located close to the Equator, there is a large consumption of lard, utilized in the preparation of all foods. Many *fazendeiros* dedicate themselves exclusively to the raising of these lucrative animals, which, with some care, can become large and very fat. It has been shown that pigs grow fat rapidly when fed with corn, and their meat is extremely tasty and healthy and is even recommended for nursing mothers and sick persons, and the resulting lard is uniform. The lard is separated from the meat, salted, packaged and shipped. It is conserved for a long time. The meat is also salted and sold.¹³

The raising of pigs was thus an almost universal practice in all the regions of the province. The process of its creation was well described by the English traveler John Mawe who noted that:

They feed their pigs on Indian corn in a crude state, the time for confining them to fatten is eight or ten months, and the quantity of corn consumed for the purpose is eight or ten Winchester bushels each. When killed, the lean is cut off the sides as clean as possible, the fat is cured with very little salt , and in a few days is ready for market. The ribs, chine-bone, and lean parts are dried for home consumption..¹⁴

To analyze the structure of production of pigs and lard we have selected as sample counties that of Cunha, and Jundiaí, situated relatively close to the city of São Paulo. Although both counties were major producers of pigs and corn - their basic food - only Cunha produced large quantities of lard, whereas Jundiaí sold only live animals to its urban market and produced little lard for export. It would appear that it was easy for Jundiaí producers to ship their animals live to the São Paulo capital market, whereas Cunha had to ship almost all of its exports to Rio de Janeiro by coastal shipping, which made the sale of live animals a much less viable proposition. In 1836, both counties averaged about 2,000 tons of corn per annum, thus guaranteeing their own animal feed.

For a pig raising center such as Cunha, the primary form of marketing was the processing of pigs into lard. But this was a complex process alternating between raising and slaughtering animals.¹⁵ Also the numbers generated by the census takers and by Müller most likely underestimated production. The German traveler Baron Luis Guilherme von Eschwege has some suggestive comments on this theme. He noted that in the early decades of the 19th century, the province of São Paulo produced 358 tons of lard and commercialized 292 tons beyond the frontiers of the province, which left only 65 tons for local consumption, which is much too low a figure given the extraordinary quantity of lard consumed in Brazil in this period. In fact he argued that production probably reached something like 4,400 tons of lard, which in turn required the raising of 100,000 pigs - a figure also not found in the census numbers.¹⁶ As for output, these 19th century figures suggest that from each pig could be extracted 44 kilos of lard. Finally the fact that Müller in his census of 1836 shows that Cunha alone produced more than two-thirds of the lard generated in the province (or 130 tons),¹⁷ seems to suggest a serious undercounting. Given the universality of pigs and the widespread use of lard one would not expect such an unusual concentration of production in just one county.

But what of the output which was registered. The 19th century travelers Mawe and Eschwege estimated that each pig raised in 8 to 12 months consumed between 200 and 250 kilos of corn in their creation, and yielded 44 kilos of lard when slaughtered. Thus the output of lard registered in 1836 - some 132 tons - would have necessitated the raising and slaughtering of 3,000 pigs which would have consumed a total of 900 tons of corn. In this year the census registered a total corn production of 2,500 tons of corn - which would seem reasonable in terms of both human and animal consumption.¹⁸

The Cunha data also permits us to examine the structure of production. The total of 133 tons of lard came from 119 producers: 109 heads of these owned 1,111 slaves and they accounted for 98% of total output. There is little question, then, that export lard was produced essentially in slave owning households. The average producer made 1,100 kilos of lard (the 10 farms without slaves averaged just 300 kilos). Thus we can see the same pattern of concentration of production in larger slave units with lard that we saw with all the other food crops. The 17 farmers who produced over 1,500 kilos made up 15% of such pig farmers and accounted for 40% of the lard processed in the county. The largest producer was a farmer of 60 years of age who registered an output of 4,700 kilos using 11 slaves. He also produced 33 tons of corn beside 1,400 kilos of beans. With his corn output this farmer was able to feed 130 pigs at 303 kilos per head, and each pig in turn produced 44 kilos of lard - thus his potential lard production was 5.7 tons - and he was registered as having produced 4.7 tons. Such data help corroborate the estimates of 19th century travelers used here.

What about the structure of ownership and production in the raising of live animals for export as seen in the numbers for Jundiaí in 1836? The county in this year produced 3,699 pigs, who were raised by 211 farmers, of which 114 owned slaves. These slave owners accounted for 80% of total production, raising on average 26 pigs, compared to just 7 pigs per non-slave household. Production was thus quite concentrated with those who raised 30 or more pigs being just 17% of the producers and accounting for two-thirds of production. The largest producer in Jundiaí was responsible for producing some 300 animals. He was 53 years of age, had 24 slaves and produced 9 tons of corn. He also refined 14 tons of sugar, 1,800 kilos of beans and 1,100 kilos of coffee. Given the ratio of corn to pigs, he would have required 95 tons of corn to raise the 300 pigs he produced and thus must have bought the corn he needed on the open market, or conversely did not declare the corn he produced for their consumption. However given the number of slaves he possessed the former is more likely.

Within Brazil, especially in the northeast, the planting of manioc roots and their transformation into manioc flour was a very significant part of commercial food production. But in São Paulo, although some manioc was grown along the coast, the highlands concentrated on corn, a substitute for manioc.¹⁹ In his 1836 census Müller noted that the average manioc crop was 89,000 alqueires, this compared to rice and corn which were in the 250,000 to 300,000 alqueires category.²⁰ This manioc output represented only 1% of the value of production in that year. Our survey of the eight counties, shows only Areias producing manioc, and then only Manioc flour. By the 1820s there were a steady 130 producers of manioc flour in the county with an average of 3,000 alqueires per annum. As in all other crops the role of the farmers without slaves was on the decline. In 1822 such family run farms produced almost half the crop, and in 1829 the remaining 35 producers who held no slaves accounted for only 10% of total output.

One last area worth examining in this survey of food production is meat production. Like all other parts of Brazil, cattle were raised in São Paulo, though nothing like on the scale in the far southern plains of Rio Grande do Sul, which shared an ecology similar to that of the Argentine pampas. But animals were raised on many farms, and there even existed ranches dedicated to raising cows for meat consumption. An unusual source of information for this sector of the economy is a detailed listing of ranches within the province in the published 1854 census of Oliveira. At this time in São Paulo there were 532 ranches (*fazendas de criação*) with 35,000 head of cattle, on which worked some 4,300 slaves and 1,700 servants (or *agregados*). Of the total number of animals raised, over two thirds (24,000) were sold off the ranch in that year. In comparison with sugar and coffee farms, these ranches held few workers. They contained only 8 slaves per unit compared to the 20 per *fazenda* in coffee and sugar, and accounted for only 14% of the farm units, 4% of the slaves and the same ratio of the

value of production. But these ranches were unusual in their high ratio of *agregados* (accounting for 26% of such workers in the province) and of course in their large land holdings (comprising an estimated 43% of all agricultural lands). Regionally the greatest concentration of these large ranches occurred in the West Paulista area (68%), with the Southern Road second (17%). The West Paulista fazendas were unusual in the high proportion of slaves which they contained which explains why they possessed four-fifths of all slaves in this sector. They also accounted for 64% of the animals raised and sold.

Thus, despite the growth of the commercial export agricultural sector, the traditional food and animal sector all remained strong and large numbers of these farms and ranches used slave labor. Some of this growth was tied to the export sector itself as the sugar and coffee estates both grew their own food and sold food crops into the market. The increasing tempo of the local economy also created demand for more food production as population increased and more traditional food producers entered more fully into the market. But the ever increasing importance of sugar and coffee exports does lead to a relative decline of slaves within this food producing sector. By 1829, although the slaves and slave owners in food production had increased considerably, their relative importance among farmers and slave owners was on the decline. The cause for this was the growth of the export crops of sugar and coffee which drew ever higher ratios of slaves into the production of these crops.

But however much slaves were drawn to coffee in the rest of the century, the food producing sector remained strong and continued to use slaves along with free labor. The bedrock of *paulista* agriculture remained food crop production, which expanded along with the export crops during the first part of the 19th century. Given the increasing importation of African slaves for sugar and coffee, even exclusive food producers, such as those planting corn, could have access to some slave labor. As the economy and population expanded, more and more of these crops were marketed locally and thus provided funds for slave purchases. Food producers selling into the market of course used more slaves than did subsistence farmers, and increasing slave concentration even among these farmers could be seen over time. But it is clear that African slaves entered even into the very traditional food producing market of São Paulo and remained an important element in these non-export crops until emancipation.

NOTES:

¹ For a more detailed study of this region see Francisco Vidal Luna & Herbert S. Klein, The Evolution of the Slave Society & Economy of São Paulo, from the 1760s to the 1850s (Stanford: Stanford University Press, 2002, forthcoming).

² On this theme, see Iraci del Nero da Costa, Arraia-Miúda, São Paulo, MGSP Editores Ltda, 1992. This theme is discussed in B.J. Barickman, A Bahian Counterpoint: Sugar, Tobacco, Cassava and Slavery in the Recôncavo, 1780-1860. Stanford: Stanford University Press, 1998.

³ A complete list of these population and production censuses for the state of São Paulo, which are housed in the Arquivo do Estado de São Paulo, will be found in Luna & Klein, The Evolution of the Slave Society, Appendix A1.

⁴ For some unknown reason there is no listing of the raising of pigs in 1836, in contrast to what had been the norm in other years, despite the important production of lard in this same year. In some years, such as 1816 and 1823, the censuses list a large number of pigs, broken down into leitões and capados; but does not mention lard production. On the other hand, in 1836 there is no mention of the number of pigs raised, but on the contrary a very high output of lard is noted, whereas in the censuses of 1804 and 1810 both pigs and lard output are mentioned. In fact are these two indices complementary? It is obvious the animals in this case were simply not listed by the census taker who listed only final output in most cases, rather than indicating the swine population in place. Could the corn also consumed by the pigs be omitted as well? It is impossible to know what the actual process was, but if this were the case, it results in an underestimation of both corn and swine production in the province.

⁵ In the years 1816 and 1823 the production of corn was given in “cavalos”. Unfortunately it has not been possible to convert this 18th century unit of weight into metric figures, as was the case with alqueires. Moreover we have found no census giving the price of corn in “cavalos” which might have permitted some type of estimate for conversion.

⁶ Auguste de Saint-Hilaire, Segunda Viagem do Rio de Janeiro a Minas Gerais e a São Paulo, Belo Horizonte: Ed. Itatiaia; São Paulo: Ed. Da Universidade de São Paulo, 1974, p. 102.

⁷ Unfortunately there are relatively few instances of the censuses recording information as to the sale of products on the internal market. In these few cases, the usually cited the local county as the destination for such sales. In the case of food products, aside from the sales in within the county, there is sometimes mentioned sales to the cities of São Paulo, Santos and Rio de Janeiro, as normal destinations for the commercialization of these products.

⁸ According to Müller, Jacareí in 1836, produced the extraordinary quantity of 1,071,400 alqueires. If this number is correct, it would mean that the value of agricultural production in this county was among the wealthiest in the province. Only Jacareí, Campinas (based on sugar, corn and bean production) and Mogi Mirim (also sugar, corn and pigs) produced more than 300,000 mil réis. But we very much doubt the correctness of this number. Although the 1836 "Listas Nominativas" are incomplete for Jacareí, we do have information on some 500 households. These households produced 3,501 alqueires of corn, as well as 18,707 cargas of this product. Assuming the conversion of 2 cargas=1 alqueire, there was produced 12,854 alqueires of corn in the county of Jacareí in this year. This figure is very far from the extraordinary number given in Müller. Although our data are incomplete, between these figures and the more complete data for earlier years, it is evident to us that the very high Müller figure is incorrect.

⁹ Thus 39% of the corn, 40% of the tobacco, 36% of the rice, 31% of the beans and 44% of the swine came from the coffee plantations.

¹⁰ J. Friedrich von Weech. A agricultura e o comércio no sistema colonial. São Paulo: Martins Fontes, 1992, p. 123-124.

¹¹ Without wagon roads or navigable rivers flowing in the direction of the coast, the majority of goods moved within the province on the back of mules in this period. Mules were a major consumer of corn. A partial agricultural census of São Paulo in 1854 listed a resident mule population on the sugar and coffee estates at some 36,000 mules [Dr. José Antonio Saraiva, Documentos com que o presidente da provincia de São Paulo instruiu o relatorio da abertura da assembléa legislativa provincial no dia 15 de fevereiro de 1855 (São Paulo, 1855), unnumbered table entitled "Quadro estatístico de alguns estabelecimentos rurais da Provincia de São Paulo"]. In this same period the custom house at Cubatão - which was at the entrance to the port of Santos - reported that some 166,000 cargo mules had passed through to the port in that year [Alves da Silva, "Abastecimento em São Paulo," pp.103-104, 162.] Thus the 36,000 mules was probably an underestimate of the total resident mule population in this period. In any case, using this population as probably a minimum resident in the province in the late 1830s and estimating their consumption of corn at 1 kilo of corn per animal per day

would mean that this number of mules consumed 13,400 tons of corn, which would have represented 14% of the corn produced in 1836.

¹² An unusual producer in this county was a women of 47 years of age who owned 96 slaves on her farm and grew 30 tons of corn, 1.5 tons of coffee, 9 tons of beans and 1 ton of rice in an average year.

¹³ Weech. A agricultura, p. 165-166.

¹⁴ John Mawe, Travels in the interior of Brazil, particularly in the gold and diamond districts of that country, by authority of the prince regent of Portugal: including a voyage to the Rio de la Plata and an historical sketch of the revolution of Buenos Ayres. (London, Printed for Longman, Hurst, Rees, Orme, and Brown, 1812), p.75.

¹⁵ See above note 2.

¹⁶ Cited in Affonso de E.Taunay, História do Café no Brasil,(20 vols; Rio de Janeiro: Departamento Nacional do Café, 1939), II, 340.

¹⁷ This figure is almost identical to what we obtained for the unpublished census for Cunha for 1836 which was (9.079).

¹⁸ Given an annual production of 2, 500 tons of corn and supposing a consumption of 900 tons used for raising production, we estimate 1,500 tons for human consumption, which given the local population, comes out to around 5 kilos per person.

¹⁹ Buarque de Holanda has stressed that São Paulo was “a corn civilization” in contrast to the rest of Brazil. He noted that “... the region of the highlands ...corresponds traditionally to the area of corn meal, while manioc is above all a maritime coastal crop” Sergio Buarque de Holanda, Caminhos e fronteiras (Rio de Janeiro: José Olympio, 1957), p.215 A French traveler referring to São Paulo in 1832, noted that “the principal cultivation is corn, one finds, on the other hand few plantations of manioc. The inhabitants of this province consider manioc flour to be bad, just as in the provinces of the North [of Brazil], it is corn flour which is so considered.” Alcide D’Orbigny, Viagem pitoresca através do Brasil (Belo Horizonte: Itatiaia/EDUSP, 1976), p.178.

²⁰ Thus 39% of the corn, 40% of the tobacco, 36% of the rice, 31% of the beans and 44% of the swine came from the coffee plantations.