Productivity Gains and the Limits of Tropical Ranching in Colombia, 1850-1950

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Contrary to the common assumption that Colombian ranchers were uninterested or unable to improve their cattle operations before the 1950s, this article provides evidence of slowly rising productivity indices from the mid-nineteenth century. These improvements were based on the diffusion of African grasses, new breeds of cattle, barbed-wire fencing, and better ranch management. However, despite such gains, Colombian ranchers failed to break into the international beef trade; their productivity levels did not rise sufficiently to compete against major exporters such as Argentina. Nonetheless, the gains they made suggest that this failure was not simply rooted in the backward and non-productive motivations of ranchers themselves. Instead, the limits of Colombian ranching also need to be understood in the context of the domestic market, the paucity of state assistance, and the difficulties of tropical ranching.

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In 1917 Robert Cunninghame Graham proclaimed that the “future of Colombia lies in cattle raising.” The English government had called upon this Scottish author and adventurer to investigate the feasibility of opening a meat-packing plant in Colombia. Cunninghame Graham returned enthusiastic about the prospects, an optimism shared by many at the time. With Europeans and Americans searching for new sources of supply, Colombia appeared well positioned to profit from the growing demand. According to Cunninghame Graham, the country had large amounts of good, cheap land, fine pasture grasses, quality creole cattle, and few diseases. It was also significantly closer to American and European markets than the principal beef exporters: Argentina and Australia. The enthusiasm was such that the minister of agriculture and commerce extolled: “it seems that Nature herself has signaled the livestock industry . . . to be at the center of our economic development and the broadest path by which [we] can achieve rapid progress.”

The dazzling promise of Colombian beef exports never materialized. The Colombian Products Company (CPC), a joint venture between US packing interests and four Colombian ranchers, finished building a meat-packing plant in 1924, but it never operated. Various theories circulated to explain the fiasco: construction delays, a downturn of the international beef market, US sanitary restrictions, and a conspiracy to thwart the development of Colombian beef exports. The real problem, however, was that Colombian beef was not competitive on international markets: its quality was too low and its price too high. European buyers graded it the same as second-class, creole carcasses from Argentina, and the price some were willing to pay would have caused the CPC to lose money.

Much of the blame for Colombia’s failure to become an important beef exporter fell on ranchers. While government officials and industry boosters encouragingly indicated how ranchers could improve their operations in the 1910s and 1920s, in subsequent decades their
optimism turned to frustration. They repeatedly cited the “backwards and routine” mentality of ranchers, and their “empirical” and “primitive” management practices, for the lack of progress. Manuel Gómez, head of the National Livestock Department, complained that, “ranchers simply use cattle to take advantage of natural grasses. The bull works alone and the ranchers collect the offspring.” Raúl Varela, Director of the Ministry of Agriculture’s Division of Rural Economy, went so far as to lament the lack of “real ranchers or real ranching.” Almost by definition, ranching was unproductive and stagnant.³

Some of this frustration fed into a deeper current of discontent with the monopolization of landholding. Ranchers became synonymous with latifundistas (large landowners), using cattle principally to occupy territory and maintain a stranglehold on rural society and political power. More generally, the presumed unproductive nature of ranching pushed numerous critics to look for a rationale other than the “possibility of selling an animal for beef.” As geographer Susanna Hecht remarked, “It is the other things that cattle do besides grow meat that make them of singular fascination.” While some would challenge this view, citing the technical progress made by Colombian ranchers, invariably those improvements only began to take hold in the 1950s. For nearly everyone, ranching before mid-century was a primitive affair, sometimes even characterized as hunting half-wild animals rather than caring for domesticated stock.⁴

But was Colombian ranching really so stagnant before the 1950s? And why, given the early fanfare, did the industry turn out to be uncompetitive internationally? There are indications that Colombian ranchers made slow but steady productivity gains after the mid-nineteenth century. In fact, rather than point to the 1950s as a watershed between a primitive and modernizing industry, these more recent improvements appear to be part of a longer history. The source of these gains was new grasses, improved breeds and crosses, barbed-wire
fencing, and better ranch management. Despite their achievements, Colombian ranchers failed to replicate Argentina’s success as a beef exporter. As many have claimed over the years, the limits to Colombian ranching were partly rooted in the attitudes and practices of ranchers themselves. Nonetheless, given the context in which they operated—the paucity of state assistance and the underlying difficulties of tropical ranching—the project of turning Colombia into a major beef exporter was a chimera from the start. However, pushing back the history of productivity gains and examining the barriers to further improvements underscores the need to reconsider the long-held view of ranchers as uninterested in questions of production. Rather than simply the byproduct of a quest for territorial domination, beef was central to the logic and dynamics of Colombian ranching.

Contrary to the general impression that before 1950 Colombian ranching only grew by bringing new land into production, historical evidence suggests that ranchers also raised productivity levels in other ways. For one, the size of Colombian cattle increased considerably. While mature steer weighed between two hundred fifty and three hundred twenty kilograms in the 1850s, they averaged about four hundred fifty kilograms by the 1950s with some pushing upwards of six hundred kilograms. This helped raise average carcass weights some 70 percent or more over a century (see Table 1). Improving yields, or the amount of meat and bone compared to the weight just before slaughter, also contributed. Through the 1910s yield estimates for cattle from the Department of (Old) Bolívar, which Cunninghame Graham considered to be light-boned and good fatteners, hovered around 50 percent. By the 1920s, however, these estimates had risen to 52 to 55 percent, with the national average catching up two to three decades later. In fact, by the 1930s, yields for the best steer from Bolívar had reached 60 percent, which compared favorably with European beef breeds. Though
incremental, rising yields enabled Colombians to slaughter sixty-three thousand less cattle in 1950 than they otherwise would have had to in order to consume the same amount of beef.\(^5\)

Scattered data suggests that calving rates also improved prior to 1950. Through the 1910s the common assumption was that the annual calf crop was about 35 percent of the number of breeding-age cows, though some put it as low as 25 percent. By the 1930s, however, estimates had jumped to about 50 percent, reaching 55 to 60 percent in the 1950s and 1960s (see Table 2). It is hard to corroborate these estimates with concrete data because many ranchers kept poor records or their books have since been lost. One exception is from the Hacienda Marta Magdalena in Bolívar (today in the Department of Córdoba), which demonstrates that such improvements did occur. Its calving rate in the 1950s also coincides with the national estimates by Luis Lorente, former director of the Centro de Estudios Ganaderos y Agrícolas (see Figure 1). In addition to producing offspring more quickly, better calving rates could have made it easier for Colombian ranchers to improve their herds through selective breeding. It also potentially lowered the cost of calves since non-productive cows still require grass and care.\(^6\)

In addition, the average age of slaughter appears to have slowly declined over the first half of the twentieth century, at least in Antioquia and Bolívar. By the 1920s the average age that cattle from Bolívar were ready to fatten had dropped from five to four-and-a-half years. Data from Hacienda Marta Magdalena also shows a steady decline in the slaughter age of steer over most of the 1913 to 1950 period. Again, these figures coincide with Lorente’s national estimate for the 1950s (see Figure 2). Reducing the slaughter age is key to making beef
production more efficient, increasing the turnover of capital, and potentially lowering management and feed costs. Younger animals also tend to produce more tender meat, which can fetch better prices in some markets. This reduction in slaughter age, however, was insufficient to alter the poor impression that European importers had of Colombian beef. Finally, the rate of beef production, which measures how much meat the national cattle herd produces annually per animal, has risen steadily since at least the 1920s (see Figure 3). With good data on the number of cattle culled annually (because of a slaughter tax), and decent estimates of the cattle population and meat production, this is one of the most reliable indicators. Not only does it confirm the growth in productivity prior to 1950, but the rate of improvement appears to have been fairly steady over much of the twentieth century: the 1950s did not mark a technological watershed in the history of the cattle industry.

It must be remembered that the data presented here are rough estimates and subject to considerable error. Historical evidence of changing productivity in the cattle industry is difficult to find and not always very reliable. It is also scattered temporally and geographically making comparisons problematic. Rather than indicating precise changes, they should be interpreted in terms of general tendencies. Nonetheless, against the pervasive impression of ranching as primitive and unchanging--driven by the desire for land and status and "absolutely incompatible with the search for capitalist profitability"--there does appear to have been some significant improvements since the mid-nineteenth century. In fact, by the 1950s Colombian ranchers had some of the best productivity levels in tropical Latin America (see Table 3).
The improvements in ranching productivity between 1850 and 1950 resulted from ranchers adopting a range of new technologies: African pasture grasses, improved breeds, barbed-wire fencing, and more attentive management. While various scholars have noted this so-called “revolution” in ranching, they generally emphasize its link to territorial expansion. Nonetheless, these technologies also appear to have helped increase the productivity of the cattle industry.9

Four new pasture grasses changed the landscape of ranching between the mid-nineteenth and mid-twentieth centuries: pará (*Brachiaria mutica*) and guinea (*Panicum maximum*) starting in the 1840s and 1850s and yaraguá or gordura (*Melinis minutiflora*) and yaraguá Uribe (*Hyparrhenia rufa*) from 1906. In 1900 Salvador Camacho Roldán, the father of sociology in Colombia, estimated that ranchers had already planted close to two million hectares in pará and guinea. The Food and Agriculture Organization of the United Nations (FAO) later estimated that, by 1958, there were about ten million hectares of such “artificial” or planted pastures in Colombia, or one-third of the total pastureland and over half of the country’s stocking capacity. These African imports tended to grow faster, produce greater biomass, and better resist grazing than most native grasses. These qualities helped them outcompete the secondary growth in new pastures cleared out of the forest, providing ranchers with a valuable tool in their conquest of the country’s lowlands. But ranchers adopted the new grasses for other reasons as well. For one, they increased stocking rates from 200 to 500 percent, reducing the area of forage typically required per head from three hectares to one or one-half. They also tended to be more nutritious than native grasses, helping to increase the size and yields of Colombian cattle. Camacho Roldán claimed that cattle raised or fattened on artificial pastures were 20 percent larger than those confined to native grasses. Similarly, when yaraguá was introduced into Antioquia in the early twentieth century, the slaughter weight of animals
fattened on the grass increased some 25 percent. Such artificial pastures could also speed up production, for example, by cutting the time required to fatten a steer from twelve to six months. While many ranchers initially used these new grasses to fatten livestock, as Africanized pastures multiplied, the better diets they afforded probably started to impact other stages of cattle raising as well: helping cows reenter heat more quickly after weaning, raising calving rates, improving disease resistance, and lowering mortality rates.$^{10}$

The second way that ranchers raised productivity indices was by improving existing cattle stocks. While Colombian creole cattle were hardy animals, well adapted to the rigors of the tropics, they were relatively small, grew slowly, and were not especially fertile. Faced with these limitations, some ranchers began to upgrade their herds by crossing them with European breeds. Starting around 1850, but especially from the 1880s, various ranchers began to import Shorthorns and Herefords as well as some Angus and Red Polls. These beef breeds were followed by better milkers--Holsteins and Normandes among others. The bulk of these imports and their crosses stayed on the Sabana de Bogotá and surrounding highlands (some two thousand or more meters above sea level) where environmental conditions were most favorable and where ranchers began specializing in dairy production. Although the total number of imports was small, the popularity of crossbreeding was such that the creole type of cattle from the highlands of Cundinamarca and Boyacá disappeared by the beginning of the twentieth century. While some criticized the results as a genetic mélange that brought out the defects of the different breeds as much as their qualities, highland cattle did become larger. The efforts also show that ranchers were willing to take risks and adopt new technologies even if they did not always do it in the most effective manner.$^{11}$

Additionally, even though most efforts to introduce European breeds and crosses to warmer mountain valleys and the hot lowlands ended in failure, some ranchers had limited
success upgrading creole stocks. A number even developed new breeds based on such crosses: the Azul-pintado (Blanco-orejinegro + Durham), the Lucerna (Hartón del Valle + Holstein and Hereford), and the Romosinuano (Costeño con cuernos + Angus and Red Poll). There was some controversy whether or not the Romosinuano had any European blood. But whether it was the result of crossbreeding or a genetic mutation is beside the point. The subsequent development of the new breed--larger, faster growing, higher yielding, and better shaped--testifies to the skills and dedication of ranchers from the Sinú Valley. The case of the Romosinuano is also suggestive of the way that ranchers from other regions could have improved their animals through selective breeding: buying good bulls and cows, choosing which males to castrate, and discarding inferior females. While direct evidence of such practices is scant, some of the improvement in these animals indicates that a number of ranchers did at least try.12

The biggest change in the genetic makeup of Colombian cattle, however, came in the wake of the introduction of zebu bulls. First imported at the turn of the twentieth century, the initial crosses with creole cows produced larger and more precocious offspring. As their popularity spread rapidly, government officials worried about the appropriateness of the zebu to improve creole stocks and the “disorganized” nature of the crossbreeding. While an anti-zebu faction managed to ban further imports for much of the 1930s, crossbreeding continued and, by the 1950s, the majority of beef animals had at least some zebu blood. Critics pointed out that the visible improvements were largely the product of hybrid vigor rather than the inheritance of zebu traits. But few ranchers heeded the warnings to preserve creole herds in order to keep crossbreeding, and Colombian beef cattle have since become almost exclusively zebu based. Nonetheless, some of the improved productivity indices of Colombian cattle between the 1920s and 1950s were likely the result of hybrid vigor as zebu blood spread through the national herd.13
Barbed-wire fencing and improved management were the other important ranching innovations of the late nineteenth and early twentieth centuries. Various kinds of fences existed prior to the introduction of barbed wire: rammed-earth or stone walls, wood, bamboo, or living (plant) fences, and ditches. But barbed wire made the construction of fences easier and cheaper and their use increased as a result. While barbed-wire fences helped ranchers reinforce their property claims and enclose communally owned and public lands, they also stimulated better management practices. By making it easier to control access to their improvements, fencing encouraged ranchers to pay more attention to breeding and to develop artificial pastures. Subdividing pastures also made it possible to use them more efficiently and to provide cattle with better care. Contrary to the common belief that ranching was dominated by huge operations, most herds were on the smaller side, often from one hundred to five hundred head. Along with the decreasing size of pastures, this made it feasible for ranchers to keep fairly close tabs on their animals if they wished. Outside of the Llanos, the repeated claim that cattle were half-wild is an exaggeration. In Bolívar, for example, Cunninghame Graham was surprised by the docility of the cattle, likely the result of relatively frequent handling. Larger ranchers from the communal savannas of Ayapel, in southern Bolívar, allowed poor peasants to milk their cows in order to keep them used to people.¹⁴

By the 1910s and 1920s, various new practices began to take hold that also exerted a positive influence on cattle-raising. The growing provision of salt, which is often found in deficient levels for cattle in tropical grasses, helped correct sub-optimal performance. The routine refilling of salt troughs also had the side benefit of increasing the contact that cattle had with cowboys. The practice of vaccinating cattle against anthrax and blackleg, which began to spread widely in the wake of their promising results and vaccine requirements to transport cattle, also probably helped lower adult mortality rates. By the 1950s the relative impact of
these previously major diseases had fallen to the point that the FAO grouped them in its “miscellaneous” category rather than list them individually. In 1929 the government also began to subsidize the construction of tick-dipping tanks, which promoted the practice of dipping to better control ticks and the diseases they spread. Additionally, the diffusion of information through various public and private journals, radio programs, and traveling state veterinarians encouraged ranchers to take better care of their animals and improve their management techniques: attend newborn calves sooner, dehorn and castrate at younger ages, cull male dairy calves, and provide better forage. It is hard to know how widely such practices spread or their impact on ranch productivity. Most likely, their distribution was quite uneven and they worked incrementally, adding to the gains obtained from improved pastures and crossbreeding. Nonetheless, the net effect of all these changes appears to have been the slow improvement of Colombian ranching.15

Although the above indications suggest that Colombian ranchers improved productivity indices before 1950, it was not enough to make them competitive internationally. The efforts to find a market for beef from the CPC’s Packing House in the 1920s were disheartening: neither the English nor Germans were interested; the Italians, who could not afford to be as discerning, did offer four pence (sterling) per pound, but accepting it would have caused the plant to operate at a loss. As Fernando Vélez, the company’s president, noted, so long as “second class” cattle sold for 8 cents per kilogram in Colombia compared to 6.8 cents per kilogram for the best creole-European crosses in Argentina and Uruguay, “it is obvious that the packing-house cannot start operating yet.” The CPC was squeezed between the relatively high cost of Colombian cattle and the relatively low quality of its beef. While it took Colombian ranchers about five years to produce a steer that yielded two hundred fifty kilograms of meat, their Argentina
counterparts could raise a steer in two-and-a-half years that yielded three hundred forty kilograms of better quality beef.  

Although Colombian ranchers improved productivity, their gains were limited. There were three main obstacles that prevented them from following Argentina’s example: inadequate management practices (though such practices need to be contextualized), meager state support for the livestock industry, and the difficulties of ranching in the tropics. Together these factors formed a nearly impenetrable barrier to further gains for even the most ardent modernizers.

First, for all the ways that ranchers improved their operations, they might have done considerably more. Some of the limits to Colombian ranching, therefore, were self-imposed. For instance, officials and industry observers frequently complained about “unsatisfactory pasture management.” Despite the diffusion of barbed wire, pastures tended to remain quite large. When Cunninghame Graham visited Hacienda Berástegui, the average stocking capacity of its twenty-five pastures was five hundred fifty head. He also described looking for the great zebu bull imported by Julián Patrón in a pasture that was “many miles in extent.” Over the next few decades the average size of pastures dropped steadily. By the early 1950s Cortes G. Randell, chief of the livestock and wool branch of the USDA’s Farmer and Cooperative Service, found that many ranchers had subdivided their lands into pastures of eighty to one hundred hectares.  

The propensity to use relatively large pastures made ranchers reliant on continuous rather than rotational grazing. This, in turn, made it difficult to efficiently manage their grass crop: ranchers tended to either let the grass grow too high, lowering its nutritive value; or they overgrazed it, causing a loss of carrying capacity. Pastures were also invariably dominated by a single grass species. “The advantages of mixed pastures are almost unknown,” the FAO reported. And rather than propagate native legumes as a valuable source of forage, numerous
ranchers removed them under the mistaken belief that they were weeds. As a result, pasture quality was not as high as it could have been. Additionally, repeated commentaries suggest that ranchers could have better attended their herds: providing pregnant cows and newborn calves with prompt care and more nutritious forage, castrating sooner and more hygienically, and more strenuously fighting disease and parasites. The FAO also prompted ranchers to increase the amount of salt they provided their herds almost ninefold, from 17,500 tons to 150,000 tons annually. In other words, there was much that Colombian ranchers still could have done in the mid-twentieth century to further improve their operations. Although they were among the most productive in tropical Latin America, Colombian ranchers lagged behind important beef exporters like Argentina and Australia (see Table 3).  

It is important to contextualize some of their management decisions, however. Even though the FAO claimed that the “drawbacks and deficiencies” of Colombian ranching originated “in the obsolete and even primitive practices which prevail in many stock farming activities,” their backwardness cannot simply be attributed to complacency, absenteeism, or extra-economic motivations. For instance, the central bank’s salt monopoly made it expensive and discouraged greater use. The tendency to use large pastures can be partly explained by the high costs of drilling wells, as further subdivision often depended on providing access to water. The relatively high cost of (importing and distributing) barbed wire also discouraged greater subdivision.  

Additionally, the calls for greater pasture variety and providing cut forage to intensify ranching were misplaced. Through the mid-twentieth century, there were few productive grass species that ranchers could employ. (Guinea is still one of the most valuable tropical pasture grasses.) Different soil requirements also meant that the available grasses were planted separately rather than mixed in a single pasture: pará in wet soils, guinea in dry, fertile soils,
and yaraguá in dry, marginal soils. Likewise, the suggestion that forage should be harvested for future use failed to contemplate the high costs of agriculture in Colombia, where mechanization only began to take off in the 1950s: it was much cheaper to let cattle rather than people harvest the grass crop. Repeated quality issues with vaccines, pasture seeds, mineral mixtures, and the like also eroded the faith that some ranchers had in the discourses of ranching modernization.20

It is likely, therefore, that many ranchers did not adopt the proposals pushed by officials and industry boosters because they were skeptical whether the benefits would outweigh the added expense and risk. Lauchlin Currie, the noted development economist, discovered such difficulties when he set out to establish a highly productive dairy farm on the Sabana de Bogotá: the cost of achieving his productivity goals made the farm unprofitable, and he was forced to sell it. His assessment of the beef industry was similar. Although highly critical of Colombian ranching when he first arrived to lead a World Bank mission in 1949, Currie eventually concluded that, “The technological backwardness of Colombian ranching is not the fault of its ranchers, but a natural economic consequence of a combination of factors, like the very limited demand, especially for high quality meat and the superabundance of grazing lands. . . . Until [demand, especially for high quality meat] is a reality, the emphatic advice of national and foreign experts will not modify [ranching] practices.” Unfortunately, Colombian consumers did not demand (and generally could not afford) higher quality beef. Without the incentives of higher prices, the cost of raising steer to maturity more quickly--a key way to produce more tender beef--outweighed the financial benefits. In fact, the market incentives discouraged the slaughter of younger animals: butchers paid more per kilogram for larger and invariably older animals. Given the genetic intransigence of native cattle, the result was a perpetuation of the three-stage form of production: between weaning and fattening, slow-growing steer were put
on lower-cost (and lower-quality) pastures, which ensured that they would mature at four to five years.\textsuperscript{21}

Curiously, price incentives formed a kind of trap: while they were not high enough to encourage the slaughter of younger animals, they were strong enough to ease pressures to modernize. In the 1920s, for example, prices in Colombia were up to 44 percent higher than in Europe. This was partly a function of the slow growth of herds (and the slow turnover of capital) as well as the expense of developing pastures. But it also reflected the strong demand for beef in Colombia during the 1920s, a period of economic boom known as \textit{La Danza de los Millones} (the Dance of the Millions). Thus, the failure to find a market in Europe for Colombian beef during the 1920s did not lead to surplus production and falling prices, as did a similar situation in colonial Rhodesia. Steady economic expansion following the Great Depression (about 4.5 percent per year on average) and fast population growth helped to sustain that demand. Between 1932 and 1957 the number of cattle slaughtered jumped 89 percent or almost 3.6 percent per annum. Domestic demand, in conjunction with slowly growing cattle herds and the lack of competition from other meats, pushed the real price of cattle up through at least the late 1950s, after which it remained relatively stable for some time.\textsuperscript{22}

At the same time, however, widespread poverty and the high elasticity of demand for beef limited how far prices could rise. While per capita beef consumption rose over the second half of the nineteenth century to a peak of twenty-six kilograms in the late 1920s, it then slowly fell to about twenty kilograms by the end of the twentieth century. (Only in the mid-1970s did the consumption of chicken begin to make up for the falling levels of beef consumption.) As a result, prices did not rise sufficiently to warrant the kinds of investments in ranch productivity and beef quality that Currie would have liked to see. But the real price of cattle did not fall either, which limited the incentives felt at other latitudes to make up falling profit margins with
improved productivity. In other words, Colombian ranchers were not forced onto a technological treadmill. Given the relatively high cost and risks of raising ranch productivity, there was often an incentive to keep production costs—and productivity indices—comparatively low.\textsuperscript{22}

The challenges of further improving productivity was not just a matter in the hands of individual ranchers, however; it was also rooted in limited state assistance to the cattle industry. As mentioned earlier, the Colombian government did make an effort to support ranchers over the years. In 1884 it hired Claude Vericel, French veterinarian and student of Louis Pasteur, to investigate livestock diseases, to determine the best method to acclimatize European breeds, and to teach veterinary students in the newly formed Instituto Nacional de Agricultura. Although the school closed in 1899 due to civil war, Vericel managed to train the first generation of professional veterinarians and initiate the scientific investigation of livestock diseases in Colombia. In the 1920s a couple of new agricultural and veterinary schools were successfully established. These played an important role training the veterinarians and researchers who provided the manpower and expertise to expand the government’s assistance to the cattle industry in the 1930s. They investigated livestock diseases, directed eradication campaigns, initiated research on improving the forage base and native breeds, and propagated scientific knowledge and practices. The government also subsidized efforts to upgrade the national herd (either directly, with subsidies to import European breeds, or indirectly, by lending out the reproductive services of bulls that it imported) and construct dipping vats to combat tick infestations.\textsuperscript{24}

Nevertheless, there were significant limits to what the state could do, especially given its fiscal constraints. For example, while the government offered to start subsidizing the cost of importing purebred cattle in 1915, it did not have the funds to make good on the offer for almost a decade. The multiplication of dipping vats was also slowed by small budgets: in 1943
the government could only offer support to 100 ranchers even though 242 requested assistance. Likewise, the state had limited funds to support basic research and promote improved practices through extension work. While Colombian ranchers benefited from scientific investigation in the United States, Europe, and even Argentina, most of this research focused on problems particular to temperate rather than tropical ranching. It was largely up to the Colombian government, therefore, to fund work on improving local breeds, pasture grasses, and other ranch technologies. While it began to support such efforts in the 1930s, its investments were insufficient to make dramatic improvements. For instance, the experimental farm charged with improving the Costeño con cuernos breed had so few animals (some two hundred) that the official in charge of the farm said the efforts were a waste of time. Similarly, while government support laid some of the groundwork, the big push in tropical pasture research had to wait until the establishment of the Rockefeller Foundation’s Colombian forage program in 1955 and, more generally, the foundation of the internationally funded International Center for Tropical Agriculture (or CIAT) in 1967. And in 1945 Heliodoro Bonilla, director of the National Livestock Department, complained that while Argentina had four hundred state veterinarians, supported by four hundred assistants and two hundred administrative workers, Colombia could only afford fifty-two. This was already a significant improvement over the situation a decade earlier when not every department had a state veterinarian. While Bolívar, the most important cattle-raising department, was the best served with three, each was responsible for attending rancher inquiries, visiting farms, disseminating information, and other extension work for over five hundred thousand head of cattle. While such efforts were not entirely in vain, there was only so much that they could do.25

The limited assistance by the Colombian state was a reflection of its institutional weakness as well as lack of funds. Its vaccination requirements, certificates and checkpoints,
subsidized vaccines, and propaganda campaigns made inroads against some traditional diseases. But many of the government’s efforts to contain or eradicate cattle diseases, especially rapidly spreading new ones, were unsuccessful. Part of the failure was budgetary in origin. While the National Livestock Sanitary Board vaccinated 30,000 cows against brucellosis in 1942, by its own admission the number should have been 120,000. A good deal of its limitations, however, lay in inadequate enforcement of existing regulations and poorly orchestrated campaigns. For instance, the Sanitary Board, created in 1927 to prevent the rapid spread of brucellosis, did not meet until 1930. The relative ease with which ranchers could acquire forged vaccination certificates and bribe officials as they moved their cattle out of quarantine zones also undermined containment efforts. While governments elsewhere faced similar enforcement problems, numerous examples from the United States, Europe and its colonies, South Africa, and Australia show that, in times of crisis, they were able to implement effective disease containment policies. By contrast, the comparative ineffectiveness of the Colombian state’s efforts meant that, by the late 1950s, annual losses from disease and parasites were still high: equivalent to one-third of yearly livestock production.26

Beyond fiscal poverty and institutional weakness, livestock improvement was not a serious priority for the Colombian state. Even though its economy was predominantly agricultural, only a fraction of the national budget was channeled to support the sector. Between 1923 and 1936 spending on agriculture and livestock averaged only 0.65 percent of total government expenditures. By the late 1940s this had risen to about 2 percent of the national budget. The share received by the livestock sector, however, was less than a quarter of this amount even though it was the largest rural activity. In 1944 the National Livestock Department’s budget was still just over five hundred thousand pesos (or less than three
hundred thousand US dollars). By contrast, the beef consumption tax, an indirect levy on the cattle industry collected at the slaughterhouse, was 800 percent higher.\textsuperscript{27}

Ineffective lobbying helps explain the limited state support for ranching. Compared to coffee planters--who organized a national federation in 1927 that took over many state functions in coffee-producing zones, including using revenue from an export tax on coffee to finance research and extension services--ranchers were much slower to organize a national association through which they could pressure the government. There were some attempts starting in the 1930s, but they were primarily regional efforts by ranchers from the Caribbean coast to prevent the duty-free importation of thin cattle from Venezuela. In this way, regional and industry-wide divisions slowed the development of a national association: while the Venezuelan imports threatened coastal breeders, they benefited fatteners in the interior close to the country’s main markets. According to industry boosters, however, the late development of a national cattlemen’s association--formed only in 1943, and with anemic support at that--was also tied to individualism and relative isolation of many ranchers. To foster a greater sense of shared purpose, they encouraged the foundation of livestock markets and fairs partly as places of socialization. But ranchers also had trouble arguing their case because of the general perception that they were a privileged, and perhaps retrograde, group that was unworthy of greater public assistance. For instance, efforts by a few congressmen to promote legislation that would have lowered the cost of salt for cattle fell on deaf ears. That ranchers had failed to develop a thriving export industry did not help either. While legislators were willing to grant tax exemptions to coffee growers, mining companies, and banana producers, they denied similar requests by ranchers.\textsuperscript{28}

The third overriding factor that stymied the ability of ranchers to significantly raise productivity levels was Colombia’s tropical environment. The two main limitations were forage
quality and the difficulty of improving native cattle by crossing them with European breeds. The tropics were not deterministic in the sense that innovations could overcome some of these obstacles, but, given the social and scientific context, these natural limits were very real. 

While early observers often remarked that the vigorous growth of grasses in the tropics represented a promising resource, their comparatively poor quality turned out to be more significant. Tropical grass tend to be exuberant, the result of a propitious growing environment and a physiological adaptation that allows them to photosynthesize faster than most temperate grasses. But pasture quality frequently matters more than quantity, and tropical grasses are generally less nutritious than temperate ones. One Australian study, for example, found that “milk production per cow from unsupplemented improved tropical pasture swards is markedly lower than from temperate swards fed at a similar stage of growth.” The nutritional quality of tropical grasses is further undermined by their rapid growth. While they might have adequate protein levels when young and tender, tropical grasses tend to mature quickly, causing their nutritional quality to drop rapidly, and become ligninous (or woody), which further lowers their digestibility. Although the African grasses that diffused through Colombia from the mid-nineteenth century tended to be more nutritious than many natives species, they suffered from the same problems of rapid growth, high-fiber content, falling nutritional properties, and difficult management. Compared to the alfalfa pastures of their Argentinean counterparts, the dependence of Colombian ranchers on tropical forage (especially in poorly managed pastures) limited the reproductive efficiency of their herds, the speed with which they matured and gained weight, and their resistance to disease and parasites.

The exuberant growth of grasses in the lowland tropics was matched by that of weeds. While African grasses helped Colombian ranchers colonize the lowlands by hindering the secondary growth in areas cleared of forest, the competition was often severe. In Bolívar


artificial pastures had to be weeded once (for pará) or twice (for guinea) yearly. This significantly raised production costs; sometimes the cost of weeding was even greater than the value of pasture production. While some ranchers set fire to artificial pastures in order to control weeds, many preferred to remove them by hand: although more costly, it made for more productive pastures. The problem of weeds also encouraged ranchers to let their grass grow high. Grazing artificial pastures more intensely might improve their quality, but it ran the risk of leaving them vulnerable to weed invasions.31

The constant high temperature and humidity of the lowlands also provided a favorable breeding ground for parasites and disease vectors. While not all cattle diseases in Colombia are exclusive to tropical latitudes, a number of them are more prevalent there: vesicular stomatitis, piroplasmosis, anaplasmosis, paralytic bovine rabies, and trypanosomiasis. Environmental conditions in the tropics also favor the reproduction of parasites. Even with the ravages of foot-and-mouth disease, the FAO calculated that, in 1958, parasitic infestations caused over half of all disease--and parasite--related losses in Colombia. The high incidence of disease and parasites raised production costs and undermined ranch productivity.32

The key environmental limitation was the difficulty of introducing European breeds into Colombia on any significant scale. As mentioned earlier, the one exception to this was in the cool highlands. Viable ranching areas in the mountains were too small, though, to satisfy the country’s demand for beef. While a few ranchers outside of the highlands had limited success upgrading their herds with imported animals, the more frequent failures from such attempts discouraged most from risking the substantial sums needed to import purebred cattle or even bring down crosses from the highlands. Critics frequently blamed the inadequate care that ranchers gave these European breeds as the reason for the high mortality rates or subsequent
degeneration. While there is probably some truth to such claims, the larger problem was the tropical environment itself.\textsuperscript{33}

One obstacle was simply the heat of the lowlands, where daily temperatures average about ninety degrees year round and only drop some ten degrees at night. Such heat levels are a problem for most European breeds, which have a solid layer of subcutaneous fat that helps keep them warm through cold winters but causes them to overheat in the tropics. By contrast, this layer of fat is discontinuous in creole cattle, facilitating the escape of body heat; zebu lay on fat between their muscles rather than under the skin. Improved European breeds were also bred to digest forage efficiently. In the tropics, however, their high metabolism rate is a disadvantage since it increases their internal body temperature, especially given the coarse quality of tropical grasses. To compensate, they not only seek shade and reduce their movements, but also eat less. As a result, European cattle in the tropics tend to grow more slowly and breed less frequently than in temperate regions. Heat-suppressed appetites can also lower their resistance to disease and parasites (further exacerbated by their comparatively thin hides). Finally, European breeds introduced to the tropics frequently undergo a process of degeneration after several generations, acquiring larger heads, thicker necks, and stunted loins and rumps. In other words, in the hot tropics, European breeds lose many of the qualities for which they were originally designed and introduced. Colombians were not the only ones who experienced such problems: North American and European ranchers did no better in Colombia or elsewhere in the tropics. “That many types of livestock originating in the Northern Hemisphere do not thrive in tropical and subtropical environments can no longer be denied,” concluded South African cattle expert Jan Bonsma in 1955.\textsuperscript{34}

Therefore, although Colombian ranchers experimented with European breeds, the environmental limits they faced effectively closed this path as a way to increase productivity
levels. Because the Pampas were hospitable to European breeds, ranchers there could import large numbers of Shorthorns and Herefords. By 1916 Uruguayan ranchers reported that only 4 percent of the national herd was composed of creole cattle. In the early 1920s Argentine ranchers were importing some 150,000 purebreds from the United States and Europe annually. By contrast, Colombian ranchers imported less than one hundred purebred cattle per year during the 1920s, and over half of these were dairy breeds destined for the highlands.\(^{35}\)

The ability to upgrade native cattle with European breeds did not, by itself, guarantee international competitiveness. While English ranchers in the highlands of colonial Rhodesia improved their cattle through crossbreeding, they continued to use cheap but relatively poor quality natural savannas, which limited their productivity gains. Likewise, European breeds on the natural grasslands of Uruguay still needed four-and-one-half years to mature as late as the 1950s. Without high quality feed, these improved breeds did not live up to their potential. The success of the Argentine cattle industry, by contrast, was founded on both English beef breeds and high-quality alfalfa pastures.\(^{36}\)

Nonetheless, the problem of Colombian ranching was not simply one of pasture quality. That Colombian ranchers could slaughter cattle at the same weight and age as European breeds in Uruguay in the 1950s is largely testament to the quality of their “artificial” pastures as compared to many natural grasslands (see Table 3). As mentioned above, they could have managed their pastures better. It also appears that there was some “unlocked” potential in native breeds. The manager of the government’s experimental farm in Valledupar, for example, noted that well-fed Costeño con cuernos showed better than expected results. But for Colombian ranchers to compete with Argentine or Australian exporters, better pastures and management practices alone were insufficient; they also needed European beef breeds. The feed-focus mantra of livestock officials (“feed makes breed”) came in the wake of the realization
that the large-scale introduction of European breeds was impossible and that Colombian ranchers were increasingly turning to the zebu to upgrade their stock. In fact, the big breakthrough in tropical ranching only began to be developed in Australia in the 1960s with improved legume-grass pastures, the application of super-phosphate fertilizer, and zebu-European crossbreeds. The Australian experience shows that ranchers in the tropics could compete with their temperate-based counterparts. But through the mid-twentieth century, at least, Colombia’s tropical lowlands turned out to be a major obstacle in the country’s quest to mimic Argentina’s beef-based prosperity.\footnote{37}

Contrary to the common belief that Colombian ranching prior to the 1950s was mired in backward practices and only capable of growing through territorial expansion, ranchers experimented with new technologies and appear to have improved the productivity of their operations. In fact, the 1950s was not a watershed; productivity indices seem to have slowly but steadily increased over the course of the twentieth century. These gains, however, were insufficient to turn the country into an important beef exporter as predicted in the 1910s and 1920s. Ranchers themselves hold some of the responsibility for this failure, as many have observed over the years. But there is more to the story than just a supposed lack of interest or ability. For one, many of the suggested improvements were not feasible given local market and production conditions. The weakness and fiscal frailty of the Colombian state also limited the options that ranchers had at their disposal. While veterinary science improved significantly over the first half of the twentieth century, many of the advances were more applicable to temperate rather than tropical ranching. The big developments in the latter depended on research programs financed by stronger states and international agencies. Finally, Colombia’s tropical environment posed a series of obstacles that made it hard for its ranchers to compete with their
temperate-based counterparts. In particular, the inability to upgrade cattle stocks with more productive European breeds posed a significant barrier to their international competiveness.

Nonetheless, the significance of this Janus-faced story of progress and limits lies in the way it pushes historians to rethink perceptions of cattle ranching in Colombia and perhaps elsewhere in Latin America. Colombian ranchers were not paragons of modernization and a good number, undoubtedly, were only marginally interested in their estates. Still, many did slowly improve their operations over time even if the gains were sometimes hard to see. The attention and investment that such improvements required challenges the widely held view of ranching as essentially non-productive. While much has been made of non-economic rationales for ranching throughout Latin America, such characterizations frequently misunderstand the nature and motivations of cattle-raising. Rather than just a means to occupy territory, underwrite political power, obtain economic rents, or boost prestige, ranchers were also keenly interested in the profits they obtained by producing beef for market. To understand the history and dynamics of cattle ranching in Colombia and around Latin America, historians need to pay much more attention to its productive aspects. The fact that Colombian ranchers paid attention to and improved productivity indices on their cattle estates underscores this point.


In the 1950s and 1960s, the Department of Bolívar was divided in three: Córdoba, Sucre, and Bolívar. The Bolívar to which I refer is the pre-1950s version. José Velásquez, “La

6. Manuel A. Pineda, “Informe de la comisión de revisión a quien pasó el proyecto de lei sobre derecho de degüello,” *Gaceta de Bolívar* [Cartagena] 454 (Nov. 4, 1866): 1-3; Salvador Camacho Roldán, *Notas de Viaje: (Colombia y Estados Unidos de América)* (Bogotá: Librería Colombiana, 1897), 75; Freyre, “Conferencia dictada.” For most of this period, such calving rates were estimated in terms of the entire herd and not just breeding cows. The rate of 35 percent is my calculation of what the stated rate of 20 percent would be if it were based solely on breeding cows.

7. Ospina to B. Jaramillo, July 24, 1930, *Correspondencia Enviada* (hereafter CE) 1928-1931, Pedro Nel Ospina (hijo) collection, Fundación Antioqueña de Estudios Sociales Archives (hereafter FAES), Universidad EAFIT, Medellín, Colombia. [note: The box is CE 1928-1931, there is no number; there is no internal pagination within the box]


15. Sodium chloride helps to maintain an ideal pH balance for ruminal fermentation and to regulate osmotic pressure at the cellular level, which effects the passage of nutrients across cell membranes. Where cattle receive optimal levels of salt in their diet, increased consumption...


17. FAO, *Livestock*, 23; Acta de la Junta General de Accionistas de la Sociedad Ganadera de Berastegui, Sept. 14, 1916, Correspondencia Recibida (hereafter CR) 1912-1916, PNOyC, FAES; Cunningham Graham, *Cartagena*, 189; Randell, *La Industria Ganadera*, 43. To roughly convert the number of head into pasture area, a good guide is one head per hectare, which was the average stocking capacity in the Caribbean coastal region on planted pastures (see Bell, “Cattle raising,” 21; Randell, *La Industria Ganadera*, 6, 8-10, 12).


23. Departamento de Contraloría, Anuario de Estadística General, Año de 1930, Vol. XXXI (Bogotá: Imprenta Nacional, 1932), 409; Ministerio de Agricultura y Ganadería, Riqueza Pecuaria de Colombia; calculada en 1947 (Bogotá: Ministerio de Agricultura y Ganadería, División de Economía Rural, 1949). For the second half of the twentieth century, including the


33. Diseases of tropical or subtropical origin, such as Texas fever, killed off a number of purebred imports. Eventually, ranchers developed methods to acclimatize the offspring of such animals (see Boaz, “Cattle Industry in Colombia,” Dec. 18, 1925, Box 133, Colombia, Narrative Reports 1904-1939, FAS, RG 166, NARA II).


<Table 1>

Table 1. Average Carcass Weights of Colombian Steer by Area, 1760s to 1960s.


Table 2

Table 2. Calving Rate, 1860s to 1960s.


Figure 1

Figure 1. Calving Rates (Percent), Hacienda Marta Magdalena and National Average, 1915-1996.

Sources: Kalmanovitz et al., “La producción agropecuaria”; Lorente, “La ganadería bovina.”

Figure 2

Figure 2. Average Slaughter Age of Steer (Months), Hacienda Marta Magdalena and National Average, 1915-1996.

Sources: Kalmanovitz et al., “La producción agropecuaria colombiana”; Lorente, “La ganadería bovina.”
<Figure 3>

<H> Figure 3. Beef Production Rate (Kilograms), 1915-=1996.</H>

Sources: Kalmanovitz et al., “La producción agropecuaria colombiana”; Lorente, “La ganadería bovina.”

<Table 3>

<H> Table 3. Ranching Productivity, Colombia in Comparative Perspective, late 1950s.</H>

(*) My re-calculation of the FAO estimate of 30.5 kg.