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Many roads from pasture to plate: a commodity chain approach to China's beef trade, 1732–1931[†]

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Abstract

The advent of refrigerated transport made fresh beef a global commodity, linking South American and Australian producers to hungry consumers in Europe and North America. With vast supplies of cattle, and growing markets in Japan, Russia, and beyond, China was the last great frontier of this global transformation. Rather than a single export trade, China's beef industry was a complex and multidirectional network of producers, processors, and consumers, its many production chains each facing distinct commercial, logistic, and political challenges. This article examines three such chains, the Qing-era caravan trade that drove live sheep and cattle to Beijing, the Harbin meat-packing industry that grew up around the Russian China Eastern Railway, and Japanese-dominated export of beef from Qingdao. A cross-section of these issues shows how the industry as a whole adapted to the new pressures and opportunities of globalization, as well as those presented by technology, foreign investment, imperialism, and war.

Keywords: cattle; China; commodity chains; Japan; meat; Mongolia; pastoralism

Introduction

China is currently the world's third largest producer of cattle and beef, with more live cattle than the United States, and nearly three times the beef production of traditional exporters such as Australia.¹ Like much of its economy, China's livestock and meat industries have undergone major transformations since the beginning of the People's Republic, and especially since the 1980s. But the foundations were laid much earlier. Nineteenth-century China was already a major producer of grazing livestock, and by the twentieth century foreign and Chinese investors were clamouring for opportunities to export this pastoral wealth to consumers as far away as Europe.

Beef emerged as a global commodity in the late nineteenth century. Led by advances in refrigeration and shipping, the globalization of the beef trade was sudden and dramatic. Europe, particularly the United Kingdom, began importing chilled beef from around the world, creating vast wealth for exporters in the United States, Australia, and especially South America, which came to dominate the industry. By the eve of the First World War, this trade was highly

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¹Data from United States Department of Agriculture, 'Livestock and poultry: world markets and trade' quarterly report, https://apps.fas.usda.gov/psdonline/circulars/livestock_poultry.pdf (consulted 1 August 2017).

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integrated: a London family that sat down to a beef dinner was able to enjoy produce that might have been shipped, fresh and profitably, from halfway around the world.

The innovation and intensity of the Atlantic beef trade has tended to overshadow developments in places such as East Asia. Even at the time, many observers overlooked Asia altogether. A detailed study from 1912 rejected the possibility of importing meat to Asia, because the inhabitants 'where they are not entirely vegetarian, are too poor to buy imported meat'.² Decades later, most eyes remained focused on a few countries. A League of Nations report from 1939 dismissed the beef trade of China as either unknowable or too insignificant to measure.³ Clearly this characterization was wildly inaccurate. China had well-developed stockbreeding, including both dense populations of barnyard animals like pigs and chickens, and regional concentrations of grazing animals, especially along its northern and western frontiers. The country had long traded beef cattle internally, and by the twentieth century exporters in cities such as Harbin and Qingdao were reaching new markets as far away as Vladivostok and Manila, as older networks of live animal trade were transformed by new sources of capital, expertise, and technology. China was tied to global trends in the beef trade, but it was not subsumed by them. The Chinese trade and its regional markets retained unique characteristics, including a significant degree of independence from the handful of players that dominated the Atlantic trade.

The development of China's cattle and beef industries is not a single story but rather the confluence and progression of numerous local ones. All of the many factors that influenced beef production – the economics of raising cattle, investment in slaughtering and processing, Chinese and foreign political concerns, and the tastes of end consumers – were highly localized phenomena. Moreover, China served many markets, including its own consumption. Compared to contemporaries in Argentina or Uruguay who funnelled most of their export trade through a single port, China's beef industry was a more complex, multidirectional web of producers, processors, and consumers, each strand of which faced distinct commercial, logistic, and political challenges. Much of what made the Chinese industry distinct was the simultaneous pull of overlapping market networks.

To make sense of this tangle of interests, suppliers, and markets, this article will focus on three separate production chains. The term and technique originate with Terence Hopkins and Immanuel Wallerstein, who proposed tracing specific items through 'commodity chains' as a way of demonstrating integration and disaggregating complex forces within global economic history. From their original 1977 article emerged a number of correlate ideas (such as value chains and commodity networks), as well as a growing field of literature built around such related concerns as the behaviour of commercial firms, the value of intermediation, and the relative power of buyers or producers to govern the standards of an industry.⁴

Each of the three production chains discussed here presents a different permutation of these forces; together they illustrate the evolution of the Chinese beef trade from the eighteenth century through to the early 1930s. The first sets a baseline by examining the consumption of cattle driven from Mongolia to Beijing. The second shows how the China Eastern Railway developed the city of Harbin into a centre for the packing and sale of Mongolian beef to the Russian Far East. The third examines how Japan came to dominate the production and seaborne export of Shandong beef out of the port city of Qingdao in the decade after the First World War. While these three production chains by no means constitute the entirety of the Chinese beef trade, each was uniquely representative of its time, and their progression shows the development of the

²James Troubridge Critchell and Joseph Raymond, *History of the frozen meat trade*, London: Constable & Co., 1912, p. 236.

³International Institute of Agriculture, Bureau of Agricultural Science and Practice, *World production in meat*, Rome: Carlo Columbo, 1939.

⁴Jennifer Bair, 'Global capitalism and commodity chains: looking back, going forward', *Competition and Change*, 9, 2, 2005, pp. 153–80; Terence K. Hopkins and Immanuel Wallerstein, 'Patterns of development of the modern world-system', *Review*, 1, 2, 1977, pp. 11–145.

industry overall, both those factors that integrated the Chinese trade into global networks, and those that set it on a distinct path.

The story we know: Emergence of the Atlantic beef trade

The milestones of the global beef trade are clearly marked by advances in technology. Because grazing animals can be driven, they have long been traded ‘on the hoof’, as part of established trade networks, or as herds were seasonally relocated. The trade in fresh meat is much more recent. During the early nineteenth century, rapidly growing European cities began seeking supplies of meat from abroad, not merely to feed hungry populations but also as a guard against potential decimation of national herds by disease or over-culling. Britain initially sourced European imports, especially pork products from Denmark and Germany. Across the ocean awaited even greater opportunities. In the middle of the century, London began importing meat from the United States. From the stockyards in Chicago, St Louis, and Kansas City, a new generation of entrepreneurs began shipping beef and pork, either tinned or fresh, preserved by the cold air of the North Atlantic.

At the same time, the race was on to develop the technology that would allow meat to cross the tropical barrier. Producers in cattle-rich countries like Argentina and Australia were prevented by cost and sanitary controls from shipping live animals, and enjoyed only a regional demand for dried or salted beef.⁵ Sensing the possibilities of the European market, various government and scientific bodies offered generous prizes to the inventor who could produce a reliable method of preserving fresh meat. From these competitions came such ideas as sealing meat in melted paraffin, fumigating it with ammonia or nitric acid, injecting it with brine, and reducing it to a concentrated paste. Many of these solutions did retain the meat’s nutritive value, but only refrigeration produced a fresh product that was acceptable to a consumer market. In 1875, Thomas Eastman made the first transatlantic shipment of refrigerated beef from New York to Great Britain. Two years later, the steamer *Frigorifique*, outfitted with an early ammonia-compression refrigerating plant, arrived to great fanfare in Rouen carrying Argentine beef that had been shipped for 110 days.⁶

Refrigerated shipping transformed global commerce in beef. By the close of the century, Argentina had replaced the United States as Europe’s main supplier. British investors poured huge sums into developing export facilities in Buenos Aires, driving expansion in specialization and scale. In addition to clashes of interest between breeders, farmers, grazers, and fatteners, the most intense competition was among the top beef exporters, especially after well-capitalized American meat interests, such as Armour and Chicago’s Swift (which purchased the British and South African-owned La Plata Cold Storage Company in 1907), began challenging the British firms. The ensuing trade war among the largest players expanded productive capacity, while driving down consumer prices, resulting eventually in internally policed percentage quotas between British and American interests.⁷

One innovation to emerge from this era of competition was the Vestey Brothers’ Union Cold Storage Company. From their start shipping American beef to Britain, the Vesteyes built a global network that included ranches in South America and Australia (which was forced by distance to ship frozen beef), and retail in Liverpool and London. This was the first successful model of vertical integration in the meat industry. Their cold storage network, by far the world’s largest

⁵On the inter-American trade, see Andrew Sluyter, *Black ranching frontiers: African cattle herders of the Atlantic world, 1500–1900*, New Haven, CT: Yale University Press, 2012.

⁶E. G. Jones, ‘Argentine refrigerated meat industry’, *Economica*, 26, 1929, pp. 158–61; Critchell and Raymond, *History of the frozen meat trade*, pp. 18–45.

⁷Jones, ‘Argentine refrigerated meat industry’, pp. 163–5; Herbert Mumford, ‘Argentina as a factor in international beef trade’, University of Illinois Agricultural Experiment Station, circular no. 164, Urbana, IL, 1912; Peter H. Smith, *Politics and beef in Argentina: patterns of conflict and change*, New York: Columbia University Press, 1969.

(capacity in 1912 was estimated at millions of carcasses), gave the enterprise the unique ability to weather global fluctuations in price, one of many ways in which scale favoured the largest producers.⁸

Although the United States had by this time become a net importer of beef, the First World War gave the American industry a temporary reprieve. War decimated European production, pushing up both demand and prices. The market again crashed after the armistice, as European nations drove down strategic reserves and reinstated quotas or duties on imports. By the end of the 1920s, much of the international meat trade had been corralled into complex networks of bilateral trade agreements.⁹

Much about this eye-catching story epitomizes the forces that drive the globalization of commodity chains. Technological advances in refrigeration and shipping allowed ever cheaper transportation over ever greater distances. Capital flows, coming especially from Britain and the United States, developed the industry in major export centres in Argentina and Australia, as well as in smaller ones like Brazil, Uruguay, Mexico, Venezuela, and Southern Rhodesia (Zimbabwe).¹⁰ As productive efficiencies and competition drove down costs, consumers developed new tastes for beef, which became a regular feature of a working-class Londoner's diet.¹¹

But there are also good reasons to look beyond it. Focusing on the point-to-point relationships between the largest exporters and the largest and wealthiest importers shows well the cutting edge of the trade: the advantage of scale, introduction of new technologies, new sources of investment, new types of productive organization. But it overlooks the networks of smaller producers and markets. Taken together, this lateral trade was also of high value, and was subject to very different iterations of the political and economic forces that smoothed the highway of trade between Buenos Aires and London. Such lateral networks often developed in parallel to, or remained aloof from, what would otherwise be mistaken for the entirety of a global trade system. As China's live animal trade shows, they often built on the advantages and connections of pre-existing trade networks.

Sheep and security in Hulunbuir

Having practised animal husbandry since prehistoric times, China already possessed a long history of distance trade in live animals, consisting particularly of seasonal drives of grazing animals from northern pastures into the agrarian heartland. Because it traversed what later dynasties would call the *'fanbu'*, a ring of ethnically distinct and semi-sovereign areas such as Mongolia and Tibet, the live animal trade was politically sensitive. Successive regimes kept it under tight control. The Ming dynasty (1368–1644) bottlenecked the trade through a series of official 'horse markets' (*ma shi*) that regulated interaction between the agrarian and pastoral worlds, appeasing Mongol sovereigns who wanted access to Chinese goods, while ensuring a regular supply of animals such as military horses. The subsequent Qing (1644–1911) abolished the markets, and restricted trade instead to approved Chinese firms, generally those from the province of Shanxi, which also were subject to a variety of regulations. Traders had to carry a

⁸W. R. Dunlop, 'A contribution to the study of London's retail meat trade', *Economic Journal*, 35, 139, 1925, p. 418; Critchell and Raymond, *History of the frozen meat trade*, pp. 76–90, 170–2; Dana C. Sycks, *Cattle raising in Argentina*, Washington, DC: US Government Printing Office, 1929, pp. 2–3; L. St. Clare Grodona, *Empire stock taking*, London: Simpkin Marshall, 1930, pp. 31–40.

⁹Lynn Ramsay Edminster, *The cattle industry and the tariff*, New York: Macmillan, 1926.

¹⁰I. R. Phimster, 'Meat and monopolies: beef cattle in southern Rhodesia, 1890–1938', *Journal of African History*, 19, 3, 1978, pp. 391–414; Robert W. Wilcox, 'Ranching modernization in tropical Brazil: foreign investment and environment in Mato Grosso, 1900–1950', *Agricultural History*, 82, 3, 2008, pp. 366–92; Doug Yarrington, 'The Vestey cattle enterprise and the regime of Juan Vicente Gómez, 1908–1935', *Journal of Latin American Studies*, 35, 1, 2003, pp. 85–119.

¹¹Ian Gazeley and Andrew Newell, 'The First World War and working-class food consumption in Britain', *European Review of Economic History*, 17, 1, 2013, pp. 71–94.

pass designating their status, and were forbidden to remain on the grasslands for more than one year. In return for permission to conduct trade with, and later beyond, the *fanbu*, merchant houses provided logistic support for the dynasty, transporting grain and goods during the military campaigns of the eighteenth century, provisioning garrison cities such as Guihua (Höhhot), and conveying tax and tribute from Mongol princes.¹²

In places such as the northern region of Hulunbair, the animal trade provided income and strategic support for pastoral defences. Unlike neighbouring Outer Mongolia, which was ruled by Mongol princes, this region was part of the military district of Heilongjiang, and its defence was directly coordinated by the dynasty. The Qing first instituted pastoral garrisons in this area in 1732, five years after the Treaty of Kiakhta affirmed the Ergune river as the border with Russia. In an effort to establish the vast grassland as a permanent defensive perimeter, the Heilongjiang Governor Jorhai resettled the region with 7,000 Barag Mongols, who were relocated from near present-day Qiqihar and Outer Mongolia, and organized into military units called banners. Solon Ewenki were resettled along the river into border defences known as *kharuul* (Chinese *kalun*).¹³ Each of the banners was allotted specific areas of pasture, from which they produced vast livestock wealth. The Barag brought with them 15,494 horses, 9,494 head of cattle, and 93,540 sheep, and the Qing gifted the Solon another 100,000 animals.¹⁴ Two centuries later, a local schoolmaster was able to boast that ‘Rich households count their sheep in the tens of thousands, and small ones in the hundreds ... [Even] the poorest households have a cow and a few sheep.’¹⁵ Necessities, such as brick tea, cloth, and boots, which could not be acquired locally, were to be supplied by eight Shanxi trade firms.¹⁶

The pastoralists paid for these purchases through an annual cycle of long-distance animal trade. Around the year 1800, the merchant houses established an annual market at Ganjuur Temple, 180 kilometres south-west of the walled town of Hulun (present-day Hailar), a site chosen for the mutual convenience of buyers and pastoralists.¹⁷ The five-day-long market was set for the beginning of the eighth lunar month, to coincide with an annual pilgrimage and festival cycle, as well as the time when herds had been fattened by summer grazing. Merchants returned to China with carts of hides and wool, as well as live animals that were driven southward on a two-month overland journey (see Figure 1), passing through other commercial centres, such as the Buddhist temple city of Dolonnuur and the vital Great Wall pass at Zhangjiakou (also known as Kalgan, meaning ‘gate’), and thence on to urban markets for sale and slaughter. The annual exchange dominated economic life in Hulunbair, supplanting the smaller trade routes plied by

¹²M. Sanjdorj, *Chinese colonial rule in northern Mongolia*, New York: St. Martin’s Press, 1980, pp. 25–6. On the restriction of Chinese merchant activity, see *ibid.*, pp. 31–9; Jia Hanqing, ‘Guihua cheng liangdian shi hua (The grain dealers in Guihua)’, *Neimenggu wenshi ziliao (Literary and Historical Materials of Inner Mongolia)*, 39, 1990, pp. 1–18; Jia Hanqing, ‘Guihua cheng de liu chenheng (The six old firms of Guihua)’, *Neimenggu wenshi ziliao*, 39, 1990, pp. 19–29; *Neimenggu zizhiqi zhi, xumu zhi (Gazetteer of Inner Mongolia Autonomous Region: husbandry)*, Huhehaote: Neimenggu renmin, 1999, pp. 42–3. On the state of firms in Zhangjiakou specifically, see Mōkyō Ginkō, *Chōkakō ni okeru ryomō bōeki: Iwayuru ryomōgyō ni tsuite (Itinerant commerce in Zhangjiakou: Mongolia merchant trade)*, Zhangjiakou: Mōkyō Ginkō Sōsaishitsu Chōsaka, 1939.

¹³*Hulunbeier meng zhi (Gazetteer of Hulunbair League)*, Hailar: Neimenggu wenhua, 1999, p. 790; Robert H. G. Lee, *The Manchurian frontier in Ch’ing history*, Cambridge, MA: Harvard University Press, 1970, pp. 52–3; Zhang Jiafan and Cheng Tingheng, *Hulunbeier zhi lüe (Draft gazetteer of Hulunbair)*, Hailar: Tianma, 2012 (first published 1924), p. 82.

¹⁴Ma Yongxiang, ed., *Hulunbeier lü Meng shang (Mongol itinerant merchant trade in Hulunbair)*, Hailar: Neimenggu wenhua, 2010, p. 195. Zhang and Cheng, *Hulunbeier zhi lüe*, p. 74; Qi Boyi, ed., *Xilinguole Meng xumuzhi (Gazetteer of husbandry in Shilingol League)*, Hohhot: Neimenggu renmin, 2002, pp. 216–18.

¹⁵Zhang and Cheng, *Hulunbeier zhi lüe*, p. 263.

¹⁶Lee, *Manchurian frontier*, pp. 96–101; Zhang and Cheng, *Hulunbeier zhi lüe*, pp. 82, 215–16; Qi Boyi, *Xilinguole Meng*, p. 218.

¹⁷David Sneath, *Changing Inner Mongolia: pastoral Mongolian society and the Chinese state*, Oxford and New York: Oxford University Press, 2004, p. 69; Ma Yongxiang, *Hulunbeier lü Meng*, p. 56.



Figure 1. Hulanbuir caravan trade. Map by Thomas DuBois.

itinerant traders, and providing producers with the vast majority of their income for the entire year.¹⁸

Mongolian cattle, Chinese beef

What can the content of this highly structured exchange tell us about the consumption of grassland animals as food? To answer, we might begin by looking not at cattle but rather at the much larger sheep trade. Japan began collecting extensive economic intelligence on this trade during the early twentieth century. A consular report from 1922 estimated the total sheep sales at the Ganjuur market at 20,000 animals. Similar sources from a few years earlier estimate 200,000 annual live sheep exports from all of eastern Inner Mongolia (which by this point included Hulanbuir). While the sheepskins and wool sold at Ganjuur were easily shipped by caravan, the primary reason for driving live sheep was their value as food. Although Zhangjiakou was not an especially large city, its residents consumed large amounts of fresh meat, which, as Table 1 shows, resulted in a significant slaughter of sheep.

Cattle were traded in smaller numbers, but their food value was proportionally higher. The Japanese sources above estimate the Ganjuur live cattle trade at 3,000 head, and the total exports of eastern Inner Mongolia at 10,000 head, yielding sheep to cattle ratios of approximately 7 : 1 and 20 : 1, respectively. However, these numbers alone are misleading. Cattle were significantly more expensive than sheep at the point of purchase: one head at Ganjuur sold for 70 *yuan*, compared to 5 *yuan* for sheep, a 14 : 1 difference that correlates roughly to the amount of meat per animal (400 *jin* for cattle versus 30 *jin* per sheep).¹⁹ Despite the large number of sheep that

¹⁸Japan Center for Asian Historical Records, National Archives of Japan (henceforth JACAR), B12083628300, Consulate of Japan in Manzhouli, 'Kanjōru shi ji Taishō 12 nen 11 gatsu (Report on the investigation of the Ganjuur market in November of the 12th Taishō year)', [1923], p. 422; Ma Yongxiang, *Hulanbeier li Meng*, p. 200.

¹⁹Estimates of the eastern Mongolia export trade are in JACAR, A06033518600, 'Cong Chifeng jing Dolun Dushikou zhi Huailai yandao diaocha baogao (Report on the road from Chifeng to Dolun, Dushikou and Huailai)', *Manmō keizai jijō (Economic Conditions of Manchuria-Mongolia)*, 10, 1917, p. 29. In 1920, a skilled labourer in northern China earned about 1.5–2 *yuan* per day.

Table 1. Slaughterhouse statistics from four Chinese cities, 1934

		Ji'nan	Zhangjiakou	Shanghai	Qingdao
Animals processed	cattle	6,898	1,710	51,231	38,102
	sheep	4,224	17,216	78,850	1,332
	pigs	84,387	17,861	425,742	42,073
Meat production (<i>jīn</i> , 1 <i>jīn</i> = 0.5 kg)	beef	2,769,600	337,948	11,797,450	17,843,710
	sheep	136,720	399,915	1,263,735	58,628
	pork	8,446,100	1,540,271	65,616,360	3,467,570
Meat production ratios	pork : beef	3.0	4.6	5.6	0.2
	pork : sheep	61.8	3.9	51.9	59.1
	beef : sheep	20.3	0.8	9.3	304.4
Price (<i>yuan per jin</i>) ^a	beef	0.12	0.23	0.22	0.19
	sheep	0.16	0.19	0.32	0.43
	pork	0.18	0.09	0.11	0.27

^aAchieved by multiplying the January 1934 price paid per animal by the number of animals killed, and dividing by the amount of meat produced. These figures would differ from the actual marketplace prices, but nevertheless are a reasonable indicator of relative value. Source: AS, 17-27-195-04, 'Shengchū tuzai diaocha (Survey of animal slaughtering) 1933–1936'.

were moved through Zhangjiakou, that city's slaughterhouses produced significantly more beef (770,000 *jīn*) than mutton (464,000 *jīn*) between 1933 and 1934.²⁰

Clearly, there were substantial differences in how these two animal exports were being used as food. One is that live sheep were valued primarily as meat, but cattle were also used as farm and transport labour, a difference that Kuo Chung-hao has traced back through classical husbandry treatises such as the sixth-century 'Techniques for the welfare of the people' (*qimin yaoshu*).²¹ Vincent Goossaert and others have discussed the ways in which both custom (Buddhist proscriptions against taking life, the Confucian moral command to repay with kindness the ox's lifetime of labour) and law (which aimed to protect animal stocks and to keep order among the stockbreeding population) protected cattle from wanton slaughter. The Qing statute 'On the killing of horses and cattle' (*zaisha maniu*), which forbade the slaughter of work horses and cattle, was copied nearly verbatim from the previous dynasty's legal code, and its spirit had appeared in previous codes dating back two millennia.²²

Who in China actually consumed cattle as food? Writing in 1882, John Nevis, an American missionary who spent much of his adult life in China, described in fairly absolute terms a revulsion for beef: 'Beef is never exposed for sale in the Chinese markets. The meat of the few cattle which are used for ploughing is, when they are killed, disposed of privately, almost clandestinely. There is a strong and almost universal prejudice against eating beef, and the practice of doing so is declaimed against in some of the moral tracts.'²³ Yet, there clearly was a market for beef. The late eighteenth century gastro-medical compendium, *Gastronomy of the Sui garden* (*Suiyuan shi dan*), included instructions for preparing all manner of meat, fish, and game. On the topic of cooking beef, it advised the buyer to 'braise the meat until extremely soft in a mixture of two parts water and three parts wine, adding soy sauce to the remaining liquid. Since

²⁰Academia Sinica, Archives of the Institute for Modern History (henceforth AS), 17-27-195-04, 'Xumu tuzai liang diaocha (Investigation of slaughterhouse output)', [1933–35].

²¹Kuo Chung-hao, 'Pigs, pork and ham: the practice of pig-farming and the consumption of pork in Ming–Qing China', PhD thesis, New York University, 2013, pp. 202–62.

²²Vincent Goossaert, *L'interdit du boeuf en Chine: agriculture, éthique et sacrifice*, Paris: Collège de France, Institut des Hautes Etudes Chinoises, 2005; E Liu, 'Qingdai "zaisha maniu" lü yanjiu' (Research on the Qing "Slaughtering horses and cattle" statute), *Lishi dang'an (Historical Archives)*, 3, 2015, pp. 67–75; Qing statute 233.

²³John L. Nevis, *China and the Chinese, a general description of the country and its inhabitants; its civilization and form of government; its religious and social institutions; its intercourse with other nations; and its present condition and prospects*, Philadelphia, PA: Presbyterian Board of Publication, 1882, p. 246.

beef has a distinct taste, no other ingredients should be added.²⁴ Several decades before the publication of Nevius' book, the British diplomat Henry Charles Sirr had already written glowingly of the quality of the beef he had eaten in Canton, which was 'nearly as good and well fattened as it is in England'.²⁵

Even areas that restricted the slaughter of cattle recognized beef's nutritional value, particularly for the elderly. The fact that the trade had to be controlled legally, with the constant promulgation of new proscriptions against private cattle slaughter, is itself a testament to the prevalence of beef consumption. But again, such restrictions were often enacted in response to local disasters; they were neither indiscriminate nor universal.²⁶ Some areas, especially those with significant Muslim populations, consumed large amounts of cattle or water buffalo meat, and traded in speciality beef products, such as *ganba*, a dried and spiced beef produced in Yunnan.²⁷ Cattle were sold and slaughtered freely in certain markets, most notably urban areas that could quickly absorb large amounts of fresh meat. An important terminus of the pastoral animal trade, the Muslim quarter of Beijing, now known colloquially as Cow Street (*niu jie*), even had its own slaughtering grounds. A nineteenth-century source described not only the scale of the trade but also the high degree of specialization in the processing of cattle and sheep:

Each day after noon, hundreds of cattle and sheep are slaughtered. The blood flows like a river. All sorts of people clamour at the scene: knife wielders, ropers, blowers, skinners, and porters. Some are wielding scales, collecting blood, collecting skin, selling meat, peeling off the membranes, gathering up the fur. Others pick over the small pieces, cut through the chest and the stomach, and extract oil from the bones. There are dozens of specialized trades. The cattle and sheep feed and clothe thousands of households.²⁸

The high price of beef in Zhangjiakou derived from a particular combination of scarcity and taste. The commercial houses that dominated the grassland trade were meticulous observers of consumer demand. They knew local tastes well enough to source different sorts of tea to suit the palates of different Mongol buyers, and were no less knowledgeable about the Chinese market for animal imports. Cattle driven in from the grasslands represented a large investment, not only because of the high purchase price but also because cattle are more difficult than sheep to drive over dry or rocky ground. While many of the cattle driven as far as Zhangjiakou were slaughtered in the city, it made more sense to continue on to larger markets like Beijing, where the price of beef was higher. As Table 1 shows, beef was less expensive in cities such as Ji'nan, where cattle were raised specifically for food, than it was in urban slaughtering centres such as Guangzhou and Qingdao, which were also centres of beef export, and was cheapest and most plentiful in cattle-skinning centres like the northern towns of Qiqihar and Heihe.²⁹ But as we shall see, market price was affected by many factors, of which proximity to supply was only one.

²⁴Yuan Mei, *Suiyuan shidan* (*Gastronomy of the Sui garden*), Beijing: Zhongguo fangzhi, 2006 (first published 1792), pp. 107–8. Sean Jy-Shyang Chen has produced an excellent translation of this text as *Recipes from the Garden of Contentment: Yuan Mei's manual of gastronomy*, New York: Berkshire Publishing, 2018.

²⁵Henry Charles Sirr, *China and the Chinese: their religion, character, customs and manufactures: the evils arising from the opium trade: with a glance at our religious, moral, political and commercial intercourse with the country*, London: W.S. Orr, 1849, p. 83.

²⁶Such notices were published in the Shanghai newspaper *Shenbao*.

²⁷Liu E, 'Qingdai "zaisha maniu"', p. 72; Carl Oscar Levine, *Butchering and curing meats in China*, Canton: Canton Christian College, 1921, p. 3.

²⁸*Beijing Niujie zhi shu 'Gang zhi'* (*Gazetteer of the Beijing Cow Street 'Gang zhi'*), Beijing: Xinhua, 1991, p. 34.

²⁹On the geography of sheep rearing versus cattle raising, see *Manmō chōsa fumeishō* (*Appended materials to investigation of Manchuria-Mongolia*), 18, 1916, pp. 34–6. On consumption, see 'Manmō sennyō chōsa narabini hōjin hatten jōkyō shisatsu hōkoku (Report on investigation of national competition and development of trades in Manchuria-Mongolia)', *Manmō keizai jijō*, 9, 1917, pp. 89–91; JACAR, A06033520000, 'Kokuryōkō engen Haborofusuke Kokka aida shisatsu hōkoku (Investigation of cross-Amur trade between Khabarovsk and Heihe)', *Manmō keizai jijō*, 24, 1920, pp. 29–30.

For more than two centuries, the caravan trade was both politically necessary and commercially viable. Cattle from the grassland were regularly driven into northern cities like Beijing, where a significant part of their value was as food. Despite the many logistic, legal, and cultural obstacles to the slaughter of cattle, beef was a part of the Chinese diet, at least regionally, and was in some cases particularly prized. But beyond political restrictions, this method of trade was constrained by logistic complexities. Driving cattle was slow and seasonal, and required a mechanism for transferring value in the other direction. Just as in the American West, developing the Chinese beef trade would require a better way of getting animals to market.³⁰

Russia and the emergence of Harbin

It was not long before foreigners began eyeing Hulunbuir's large supply of beef cattle. Russian traders had been active in both Outer and Inner Mongolia even before the 1860 Peking Treaty legalized flow of people and livestock. By the beginning of the twentieth century, the Trans-Siberian Railway had connected European Russia to the Pacific, while new settlements in Amur and Maritime provinces along the Chinese border were emerging as important markets in their own right. This population grew as the First World War and the Russian Revolution drove capital and people into the Russian Far East.

Russian demand for beef cattle was served by a live animal trade, which was driven overland at various points along the long and sparsely populated land border with Mongolia and China. A concerned Qing official wrote in 1886 about *kharuul* in Hulunbuir trading cattle and horses across the Ergune river.³¹ A generation later, Japanese consular reports described a trade in live cattle by Mongol herdsmen to Russians all along the border. Further east, Russian and Chinese middlemen in the Chinese border town of Hunchun plied a small but brisk trade, driving 30–40 head per day from Korean villages on to Vladivostok.³² Legal restrictions on the trade were extremely hard to enforce. Authorities monitored sales at places such as Zhangjiakou, both to ensure tax payment and because Russian merchants were known to purchase stolen livestock.³³ Animals entering Russia were supposed to be held at the border but, in reality, traders could easily avoid the expense of quarantine simply by travelling off the main road.³⁴

Initially, the slaughtering was done in Russia rather than China. Russian merchants in western Mongolia drove livestock to meat processing plants in Irkutsk.³⁵ Cattle from Hulunbuir had a shorter journey, to the border town of Zabaikalsk, which was dotted with slaughtering and processing facilities.³⁶ Meat processed in Russian slaughterhouses was sent on by rail to a developed internal market, one that seems to have continued for years after the Russian Revolution, when many of the animal buyers at the Ganjuur cattle market in Hulunbuir still worked for Zarim, a Kazan (Tatarstan) concern that sold meat to buyers in both European and Asiatic

³⁰On the transition from driving to rail in the American industry, see David A. Revzan, *Livestock production and marketing: selected readings*, Chicago, IL: Institute of Meat Packing, 1935, pp. 1–8.

³¹AS, 01-17-024-03, 'Heijie nianzhong huizou an (Collected year-end memorials from the Heilongjiang border)', 1886.

³²JACAR, B11091050500, 'Kokuryōkōshō ni okeru bokuchikugyō narabi ni bokugyō kōshi setsuritsu keikaku ni kanshi hōkoku no ken (Report on pastoral industries and plans to establish pastoral companies in Heilongjiang)', 1914.

³³AS, 03-19-093-06 'E'shang yun niu chu Zhangjiakou shou banshui an (Payment of conveyance tax by Russian horse and cattle exports from Zhangjiakou)', 1914; N. E. Edinarkhova, 'K istorii Russkikh Mongolii (On the history of Russians in Mongolia)', <http://pandia.ru/text/80/080/33149.php> (consulted 11 November 2016).

³⁴Elizabeth Endicott, trans., *Pages from the past: the 1910 Moscow trade expedition to Mongolia*, Eastbridge, CT: Norwalk, 2007, pp. 87–8.

³⁵E. I. Lishtovannyi, *Mongoliya v istorii vostochnoi Sibiri (XVII–XX v.) (Mongolia in the history of eastern Siberia (seventeenth century–early twentieth century))*, Irkutsk: Irkutsk State University, 2001, p. 4.

³⁶JACAR, A06033010900, 'Mōkō bokugyō jyōkyō chōsa (Investigation of pastoral industries in Manchuria and Mongolia)' *Chōsa shiryō (Survey materials)*, 26, 1937, pp. 203–5. JACAR, B11091049300, Consulate of Japan in Harbin, 'Kairaru oyobi sono fukin Mōko chihō ni okeru kachiku narabi ni dō fukusanhin bōeki jōkyō ni kan suru ken (Stock raising and secondary industries in Hailar and surrounding Mongol areas)', [1915], pp. 168–72.

Russia. Yet, in the absence of domestic processing capacity, meat exports from China were limited to items such as intestines, which could be preserved in salt for use as sausage casings. According to Japanese sources, Hailar exports of sheep and cow intestines reached markets in Berlin, Riga, and London.³⁷

The export of fresh beef began with the construction of two new Russian railways: the Chinese Eastern Railway (CER), which traversed northern Manchuria, and the South Manchuria Railway (SMR), which connected to the CER and ran south to the port of Dalny (Dalian) (see Figure 2). Opened to passenger traffic in 1903, the CER initiated a new wave of settlement and trade within the cattle-producing regions of Hulunbuir and northern Manchuria. Its five-year construction brought in 200,000 labourers to lay track, fell trees, and dig tunnels, as well as thousands more who provided food, housing, and entertainment for the workers. New towns, such as the border crossing at Manzhouli (across from Zabaikalsk), the lumber town of Yakeshi, and the farming centre of Zhalantun, were founded by or grew with these railway pioneers. The line also changed the ethnic composition of the region. Most of the workers were Han Chinese, but the line also employed Russian surveyors and engineers, and attracted Russian entrepreneurs and adventurers; by 1922, the growing town of Hailar was about one-third Russian.³⁸ These new immigrants brought with them new tastes and new animal breeds that helped transform the livestock market.

The CER developed the meat trade in two ways. It moved people and goods across the densely forested Hingan mountains, which had previously had been an impediment to travel, particularly in winter. The line lowered the costs of carrying goods such as coal into the growing city of Hailar, but most of the trade flowed out: east through Harbin and on to Vladivostok, where goods were loaded onto oceanic steamers operated by the railway. This combination of railway and maritime networks made it profitable for the first time to export bulky items to a global market, prompting the development of timber, mining, and farming industries across the length of the line.³⁹ The railway itself was a magnet for investment and industry. In addition to moving heavy goods, the rail line also encouraged the development of banking in towns like Qiqihar and Hailar, easing the flow of productive investment, and monetizing the export economy, much to the advantage of producers such as pastoralists. Even after Japan gained control of most of the SMR (along with the city of Dalian) in 1905, the two lines remained the focus of capital-intensive industries such as mining and manufacturing. The commercial arm of the CER itself invested along the length of the line, building hotels and clinics, and especially productive improvements, such as lumber yards and wool-washing stations, to encourage industrial development. Because the railways and adjacent lands were leasehold territories under foreign sovereignty, they were partially insulated from Chinese restrictions on cattle slaughter. The CER actively encouraged the meat industry by discounting shipping, and providing free use of icehouses and storage facilities in Hailar and Manzhouli.⁴⁰

The two lines converged on the city of Harbin, which quickly developed into a major centre for beef production and processing. Both rail lines ran through cattle producing areas. The CER crossed the grasslands of Hulunbuir, which held approximately half of the estimated 300,000 head of cattle in Heilongjiang province, while the SMR ran through the grain belt of Manchuria. The widespread use of oxcarts in Manchuria promised a steady supply of farm and draft animals; a 1917 survey of Heilongjiang counted nearly half as many cattle as pigs.⁴¹ The railway also gave

³⁷JACAR, B11092082700, 'Chō, torui (Intestines and stomachs)', 0434; JACAR, B11091049300, 'Kairaru oyobi sore fukin (Hailar and its vicinity)', 1922, p. 172.

³⁸*Hulunbeier meng zhi*, pp. 160, 813.

³⁹Sakatani Yoshiro, *Manchuria, a survey of its economic development*, New York: Garland Publishing, 1980 (first published 1930), p. 180; JACAR, A06033517400, *Manmō keizai yōran (Overview of economy in Manchuria and Mongolia)*, 1916, pp. 553–61.

⁴⁰China Eastern Railway, *North Manchuria and the Chinese Eastern Railway*, Harbin: CER Printing Office, 1924, pp. 141–4.

⁴¹JACAR, A06033517500, *Manmō keizai yōran (Overview of economy in Manchuria and Mongolia)*, 1917, p. 117, 553–61.

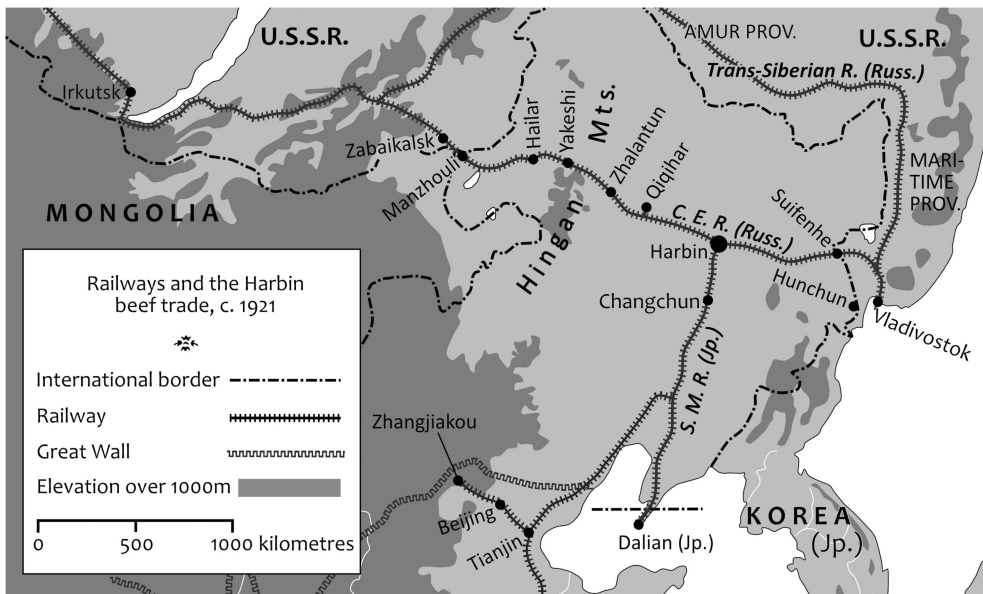


Figure 2. Railways and the Harbin beef trade, c. 1921. Map by Thomas DuBois.

both pastoralists and farmers more freedom to sell animals, at any time of the year, at Hailar or any number of smaller markets along the line. The needs of the growing dairy industry, also centred in Harbin, ensured a steady supply of calves, which were raised to mature weight and sold.⁴² Ample space, plentiful grain and bean husks from the region's numerous oil mills, and six months of cold weather (when most of the slaughtering took place) all favoured the growing industry in Harbin.

Beyond its access to cattle-producing regions, Harbin was uniquely suited to its new role as a meat-packing centre. Early twentieth-century Harbin was a commercial boomtown. A hub of soybean and grain export industries, its population had swelled from virtually nothing to one-third of a million within a single generation.⁴³ The city was not only a wealthy and productive centre of finance and industry; it was also a locus of epidemic research.⁴⁴ In 1911, Harbin became home to the Manchurian Plague Prevention Service, which remained on hand to oversee veterinary and hygiene concerns in the new slaughterhouses and markets.⁴⁵ The novelty of hygienic oversight cannot be overstated. Writing in 1898, the Surgeon General of the United States Navy described the traditional slaughtering ground outside Shanghai as a fetid hellscape of flies and foul odours, where sick and dying animals were slaughtered for meat, and pools of dung and blood mixed and rotted under the hot sun. Even with the city under foreign administration, it required a twenty-year struggle to erect a modern abattoir and effect regulation of meat storage

⁴²Thomas David DuBois, 'China's dairy century: making, drinking and dreaming of milk', in Rotem Kowner, Guy Bar-Oz, Michal Biran, Meir Shahar, and Gideon Shelach, eds., *Animals and human society in Asia: historical and ethical perspectives*, Basingstoke: Palgrave Macmillan, forthcoming 2019.

⁴³Patrick Fuliang Shan, 'A city that emerged from the northern wilderness: business and Harbin, 1898–1931', *Chinese Business History*, 2, 15, 2005, pp. 6–8; David Wolff, 'Bean there: toward a soy-based history of Northeast Asia', *South Atlantic Quarterly*, 99, 1, 2000, pp. 241–52.

⁴⁴JACAR, C13010346200, 'Hashi wo chūshin to suru hoku Man sangyō kaihatsu hōsakuan, 1917–1931 (Trade development policies for northern Manchuria, centering on Harbin, 1917–1931)', 1931.

⁴⁵CER, *North Manchuria*, p. 136; Thomas David DuBois, 'Public health and private charity in northeast China, 1905–1945', *Frontiers of History in China*, 9, 4, 2014, pp. 506–33. On the cultural meanings of the industrial slaughterhouse more generally, see Paula Young Lee, *Meat, modernity, and the rise of the slaughterhouse*, Durham, NH: University Press of New England, 2008.

and transport.⁴⁶ The new city of Harbin had no such legacy to contend with; its industry would be born on a modern footing.

War also facilitated the rise of the industry in Harbin. Responding to demand created by the Russo-Japanese War, the city's slaughterhouses produced 2,792 tons of meat, primarily pork, in 1905. A survey from two years later listed slaughtering and meat processing among the city's earliest specialized industries. Pig slaughtering spiked again during the First World War: in 1910, the railway carried 16,706 pigs into the city; by 1918, that figure had reached 85,500. In tandem with a fall in the price of pork, the number of pigs slaughtered crashed to 33,823 the following year. Partially as a result of disruption to rail traffic after the October Revolution, only 2,810 animals were imported into the city in 1919. Imports rebounded to an average of 10,000 per year between 1920 and 1924, and then fell off entirely after 1925.⁴⁷

Harbin's beef industry followed a slightly different trajectory, but relied on the same advantages. As with pork, the shipping of live cattle by rail grew in importance in the first decades of the twentieth century. In 1903, only 682 head of cattle were shipped to Harbin by rail. Three years later, that number had grown to 11,538, just under half of the 28,000 sold in the city. During these years, live cattle were still being exported to Siberia and Europe, 15,000 head in 1908 and 18,499 in 1912, but these live exports were no longer for lack of domestic slaughtering capacity.⁴⁸ By 1908, three industrial slaughterhouses along the CER: two in Harbin (in Fujiadian, and Old Market Street), along with a third in Hailar, processed 68,510 animals, just under half of which were cattle, mostly slaughtered in the larger Fujiadian slaughterhouse. Slaughtering cattle represented a high addition of value, compared to other animals, and the growth of slaughtering capacity in the region was one reason behind the decline in the live cattle trade to Russia, from 64,097 head in 1913 to 9,061 head in 1919. (Nationally, the cross-border trade in pigs and chickens continued more or less unabated during the same period.)⁴⁹ Pastoral Hailar, in contrast, slaughtered mostly sheep, fewer cattle, and no pigs.⁵⁰ In 1924, the abattoirs of Harbin accounted for 24,196 head of cattle, just over half the 45,863 processed by slaughterhouses along the entire length of the CER. Table 2 confirms the central role of Harbin, the 1911 export figure of 5.4 million kg of beef corresponding to roughly 20,000 animals.⁵¹

The emerging beef industry in Harbin attracted global investors. Foreign buyers were active in the Harbin cattle market (*da niu fangzi*) as early as 1903, and the growing Russian population (estimated in 1905 at nearly one-quarter of the city's 100,000 inhabitants) became a dominant power in the purchase of livestock from across the region. Much of the early investment in the industrial meat industry was Russian, either private investors in Harbin, exporters such as Zarim, or the CER itself.⁵²

Russian investors were joined by the Union Cold Storage Company's William and Edmund Vestey, who by this time had already proven themselves in the cutthroat markets of Chicago, Buenos Aires, and Northern Australia. The Vesteyes saw great potential in China. The two brothers had first visited Nanjing in 1912, and the following year founded the International Export Company Chiangsü (also known by the Chinese name *Heji yanghang*), investing

⁴⁶W. J. Blackwood, 'Meat and milk inspection in Shanghai', in US Department of Agriculture, ed., *Fifteenth annual report of the Bureau of Animal Industry for the year 1898*, Washington, DC: Government Printing Office, 1899, pp. 205–12.

⁴⁷*Haerbin shizhi, Riyong gongyepin shangye, fushipin shangye, yinshi fuwuye (Gazetteer of Harbin, consumer goods, food industry and food trade)*, vol. 15, Harbin: Heilongjiang renmin, 1996, pp. 445, 451, 456, 469, 471.

⁴⁸*Haerbin shizhi*, pp. 474, 480.

⁴⁹China Maritime Customs, *Returns of trade*, 1915, vol. 3, Shanghai: Statistical Department of the Inspectorate of Exports, 1916, p. 569; *Returns of trade*, 1919, vol. 1, p. 536.

⁵⁰JACAR, B11092063800, Consulate of Japan in Harbin, 'Kita Manshū Tōyō tetsudō sōsyakuchi ni okeru shokuniku jūyō jōkyō hōkoku no ken (Situation regarding meat requirements in leased zone along China Eastern Railway in northern Manchuria)', [1909].

⁵¹CER, *North Manchuria*, pp. 141–4.

⁵²*Haerbin shizhi*, p. 479; *Suihua diqu zhi (Gazetteer of Suihua district)*, Harbin: Heilongjiang renmin, 1995, pp. 400–2.

Table 2. Meat shipments in Manchuria, 1911

	Imports (thousand kg)	Exports (thousand kg)
Harbin	269.3	5,385.6
From Harbin on Manzhouli line (to west)	892	2,188
From Harbin on Kuanchengzi line (to south)	50.5	656.4
From Harbin on Suifenhe line (to east)	589.1	505
Total	1,801	8,734.8

Source: JACAR, A06033517400, *Manmō keizai yōran (Overview of economy in Manchuria and Mongolia)* [1916], p. 556.

£250,000 in a facility meant initially to process ducks and egg albumin. In 1916, at the height of the First World War, that facility was able to process 200 tons of eggs per day, and had slaughtering and storage capacity for 20,000 ducks or chickens, as well as 3,000 pigs and 400 cattle. In that year, with the global market in meat booming, Union Cold Storage established the British Produce Export Company in Harbin. With the brothers themselves in possession of 99.7% of company shares, Produce Export invested £100,000 to build stockyards, slaughterhouses, cold storage (including the city's first mechanical refrigeration plant), and shipping facilities in Harbin, as well as a purchasing office in Hailar.⁵³

Although Produce Export's registration documents spelled out the company's intention to export beef, lamb, and pork to Britain, it seems that the London market for Mongolian beef did not materialize. In 1917, Produce Export purchased 10,000 hogs for export to Europe, and a report from 1922 shows the company contributing to the growth of imports of live cattle from Hulunbuir to Harbin.⁵⁴ Beef from the Nanjing works did briefly reach Britain, but there is no evidence that beef from Harbin ever arrived at the Vestey's own retail outlets in London, which were still supplied primarily by enterprises in Argentina, Australia, and elsewhere. In the end, the Vestey operation was important to Harbin, but the reverse was less true; the Harbin works would remain only a small part of the sprawling Vestey empire. From the European perspective, they were probably most useful as a hedge against disaster elsewhere in the notoriously unpredictable global production chain.

Instead, beef processed in Harbin went on to a variety of markets in China and overseas. The wartime market for live cattle in Harbin peaked in 1916, with 37,000 head sold to Chinese, Russian, and British buyers. As the war drew to a close, the Harbin market was energized by speculation on the possibility of new export markets in Europe and elsewhere. Soon after the war, Manchurian beef 'of very excellent quality' was reportedly sent under French flag to ports in Egypt.⁵⁵ But the real market for Harbin beef still lay to the east. Table 3 shows that between 1913 and 1916, the majority of beef was exported through the border at Suifenhe, and on to Vladivostok. Strategic but remote, Vladivostok had always been a challenge to provision. In 1898, the Russian government began negotiating with Australian producers to supply the city with seaborne shipments of frozen beef, which in the aftermath of the conflict with Japan briefly spiked at 9,000 tons.⁵⁶ Ten years later, as the city overflowed with refugees and troops, it came to rely on more local suppliers. During the 1920s, the CER continued exporting beef and mutton to Vladivostok and Maritime Province, edging out earlier imports from Canada and Australia, and even preferred suppliers in Korea and Qingdao. A CER report attributed this change to the high

⁵³CER, *North Manchuria*, pp. 144–5; JACAR, B12083628300, Consulate of Japan in Manzhouli, 'Kanjōru shi (Ganjuur market)' [1924], p. 439. Registration documents of Produce Export are held in the Public Records Office of Hong Kong, HKRS111-4-176. For more views on the Vestey's, see Yarrington, 'Vestey cattle enterprise'; Phimster, 'Meat and monopolies'; Wilcox, 'Ranching modernization'.

⁵⁴*Haerbin shizhi*, p. 469.

⁵⁵A. W. Pearse, *The world's meat future*, London: Constable and Company, 1920, p. 294.

⁵⁶Critchell and Raymond, *History of the frozen meat trade*, pp. 239–40.

Table 3. Destination of meat shipments in Manchuria, 1913–16 (thousand kg)

	1913	1914	1915	1916
Between CER stations	1,770.7 (18%)	1,603.9 (18%)	1,165.1 (15%)	1,041.4 (10%)
to Ussuri line (east)	5,130.6 (52%)	4,487.9 (51%)	4,398.8 (56%)	7,309.5 (70%)
to Zabaikalsk line (west)	1068.7 (11%)	786.9 (9%)	399.8 (5%)	141.0 (1%)
to SMR (south)	2.0 (.02%)	2.2 (.02%)	5.0 (.06%)	1.6 (.02%)
Total^a	9,885	8,795	7,884	10,410

^aTotal shipments includes both imports and exports.

Source: JACAR, A06033525800, *Tōshin tetsudō shōgyōbu shigyō seiseki gikyō* (Operations of the CER department of industry), 2, 1915, pp. 161–2.

quality of the region's animals, and by all accounts the Vladivostok market did indeed prefer the taste of Manchurian to Australian beef, although the unpredictability of oceanic shipping capacity was at least as important.⁵⁷ Russian purchases of Harbin beef began to weaken after the war, accelerated by the reopening of sea-lanes, an outbreak of bovine disease in 1921, and continued insecurity in eastern Siberia. Yet even after Sino-Soviet clashes closed the Chinese border to rail traffic in 1929, meat from Harbin continued to reach Russian markets.⁵⁸

Against the backdrop of the growing Harbin industry, Russian importers continued to expand their presence, placing Russian and Mongolian buyers at the Ganjuur fair and locally throughout Hulunbuir. At the 1922 Ganjuur market, a concern known as the Morovich brothers bought 400 head of cattle, Zarim bought 1,200 head, and Barukhtonski 5,000 head, while Produce Export made an advance order for only 1,000. In the early 1920s, Russian investors began to consolidate their operations, establishing a Mongolian Beef Export Company and investing in refrigerated ships to export to Amur and Maritime provinces.⁵⁹ Over time, Produce Export came to command an ever-larger share of the trade, purchasing 6,400 live cattle and 141,000 sheep in 1924 alone.⁶⁰ But conflict was not inevitable, in part because Produce Export cooperated with Zarim and other experienced buyers at the point of purchase, and because the Harbin outfit seemed to be moving towards sheep, which could be sold frozen, and were thus more suitable for long-distance shipping.⁶¹

The rise of beef export production in Harbin shows the decisive role of a number of factors. Most obviously, the railway developed finance and industry along its length, and allowed the production and export of fresh meat on a scale that had never been possible. The region's turbulent history proved to be an unexpected asset. War provisioning created instant demand for meat, as did the flow of migrants, many of whom brought wealth, experience, and business contacts. The new industry uniquely suited this sort of investor. Harbin's export firms understood international hygienic standards of veterinary inspection, slaughtering, and storage, and brought capital and connections that carried beef to new markets in Amur, Maritime Province, and Siberia. While the trade was not for the light of pocket, it appears that Harbin's slaughtering and export industries did not necessarily favour size. The well-capitalized Vestey operation did

⁵⁷CER, *North Manchuria*, pp. 135, 142, 150; JACAR, B11090352400, 'Urajō ni okeru bukka ni kan shi hōkoku no ken (Report on prices in Vladivostok)', 1914.

⁵⁸*Haerbin shizhi*, p. 474.

⁵⁹JACAR, B11092081800, 'Shokuryōhin kankei zakken, nikurui (Items related to foodstuffs, meat)', 1922, pp. 81–2; JACAR, B12083628300, Consulate of Japan in Manzhouli, 'Kanjōru shi ji Taishō 12 nen 11 gatsu (Report on investigation of the Ganjuur market in November of the 12th Taishō year)', 1923, pp. 422–6.

⁶⁰CER, *North Manchuria*, p. 144; JACAR, B10074047500, Consulate of Japan in Manzhouli, 'Eikoku shokuhin yushutsu kaisha (British Produce Export Company)', 1925.

⁶¹JACAR, B12083628300, 'Kanjōru shi', p. 439.

not seem any better placed than even the smaller Russian firms, who could rely on the infrastructure of icehouses and shipping facilities built by the railway. Within this world, Produce Export seems to have acted uncharacteristically as a regional player, working with local firms, and serving local markets, rather than its global retail hub in London.

Qingdao turns to Japan

Even with the development of the Harbin industry, large numbers of cattle were being exported from agrarian regions along the coast. In 1903, a worried Qing official criticized the loss of cattle from the southern province of Guangxi: traders in the city of Wuzhou were selling cattle, 15,000–20,000 head each year, to the British garrison in Hong Kong. Further north, local officials in the port of Tianjin seized a shipment of live cattle destined for export. Although these officials had been acting in the spirit of the ban against slaughter, British and American consuls in Guangdong accused them of overstepping their authority and forcing honest merchants to renege on existing contracts. The dynasty's overall policy remained unclear, or at least it appeared so to the American investor who inquired through the Beijing embassy about opening a slaughterhouse near Tianjin. Noting the likely investment of 150,000 silver taels and the creation of job opportunities, the embassy asked if the dynasty's position on beef exports had changed. Citing the concerns of the Qing law, the response indicated that it had not. Seeking to exert some control over the trade along the coast, central authorities formally closed Cheefoo (Yantai) and Vladivostok to cattle exports, restricting the northern trade to the port of Qingdao.⁶²

Located on the coast of Shandong peninsula, the city of Qingdao resembled Harbin in a number of ways. It was founded in 1898, and became the terminus of a foreign railway, in this case the German-financed line connecting to Ji'nan. Over subsequent decades, it remained an outpost of foreign capital and influence. As in Harbin, war turned the tide against the founding power. Japan seized Qingdao late in 1914, and thereafter maintained an aggressive presence, using the city as a major manufacturing and logistics base for north China. In subsequent years, Japan came to dominate trade through the port, in 1918 accounting for 86% of the ships and 78% of the shipping tonnage in and out of the harbour. Between 1916 and 1922, the value of Japanese trade with the port grew by a factor of five.⁶³

Equally instructive are the differences between the two cities. Like Harbin, Qingdao was located near a large cattle-producing catchment, but, rather than pastoral Hulunbuir or the grain belt of Manchuria, Qingdao drew primarily from the densely populated agrarian regions of Shandong province, precisely where conflict over Chinese government restrictions on slaughtering was most pronounced.⁶⁴ Although Qing authorities had opened Qingdao to the cattle export trade, repeated agrarian disasters during the 1920s prompted officials of the subsequent Chinese Republic (founded 1912) to control or stop altogether the sale of farm cattle to slaughtering concerns. In addition, the decade was marked by growing political tensions, and a pronounced antipathy to Japan, created in no small part by Japan's refusal to cede its control of German interests.

⁶²AS, 02-22-008-07, 'Jinfa gengniu chukou (Prohibition of draft cattle exports)', [1905]; AS, 02-13-042-03-002, 'Meishang niyu Beiyang tongshang kouan chuanshe dongniurou chang guizhengfu yijian ruohe xiangxi shengfu you (Request for information for detailed government opinion by American merchants seeking to build frozen beef plant in Beiyang treaty port)', [1910]. *Guangdong quanye bao (Guangdong Enterprise Bulletin)*, 80, 1909. The tael was a standard measure of silver bullion used especially in official and large-scale transfers. In 1909, 1 Haikwan (Customs) tael was valued at approximately US\$0.63 or 2s. 7¼d. in British Currency. China Maritime Customs, *Returns of trade and trade reports, 1918*, Shanghai: Inspectorate General of Customs, 1919, p. 1.

⁶³*Qingdao shi zhi: duiwai jingji maoyi zhi (Gazetteer of Qingdao: foreign trade)*, Beijing: Wuzhou chuanbo, 2001, pp. 1, 21, 92.

⁶⁴JACAR, B06050487000, 'Kita Shi ni okeru sakusan shigen kankei (Husbandry resources in northern China)', 1931.

During these years, Japan was itself developing a taste for beef. For much of the previous Tokugawa period (1600–1868), a Buddhist-inspired proscription against animal slaughter had shaped the Japanese diet. Just as in China, this ban was only partial: it permitted consumption of meat by the elderly, the hereditary warrior class, and foreigners, who kept their own slaughtering ground near the port of Yokohama. The 1868 Meiji Restoration ushered in a new era of beef consumption, if not as food then as aspiration. The Tsukiji district of Tokyo developed into a thriving slaughtering and beef-selling centre that attracted both Japanese and foreign merchants. Although actual per capita consumption of meat was vanishingly small (1921 figures show slaughter of 277,456 domestic and 40,000 imported cattle for a population of 56.8 million, suggesting an average of just over 1 kg of beef per person per year), the taste for beef became emblematic of the new era, particularly after the widely revered Meiji emperor adopted the diet publicly in the 1870s.⁶⁵ The Japanese military was provisioned with beef during the decade of continental wars (the Sino-Japanese War, the Boxer suppression, and the Russo-Japanese War) between 1894 and 1905. Having exhausted local options, the Japanese quartermaster was forced to cast around for other supplies, including dried beef from Argentina, before deciding on the option of importing salted beef from Canada.⁶⁶ Over subsequent decades, Japanese authorities closely monitored the supplies and price of beef on the civilian market.⁶⁷

Cutting-edge beef export industries in Qingdao dated from the period of German control. German authorities had introduced regulations for hygienic slaughter and storage in 1899, and completed the first modern slaughterhouse in 1906, soon after the city was designated the sole northern port for legal cattle and beef exports. Built at a cost of 850,000 Marks, this slaughterhouse was fitted with refrigeration equipment imported from Dresden, and staffed with military veterinary inspectors, some of whom remained on for a time after the imposition of Japanese control in 1914. The plant processed 15,000 animals in its first year, initially serving the city's 4,000 European and American residents, as well as a large catchment of Chinese consumers in nearby villages, who consumed the plant's relatively steady production of pork. In contrast, the growing output of beef, shown in Table 4, was primarily for export.⁶⁸

Like Hulunbuir and Manchuria, Shandong proved to be an excellent production base. The province was rich in cattle, 1.7 million head in 1932. Unlike stall-feeding, cattle raising in this dense agricultural region did not divert resources from human consumption (what Harro Maat has called an 'anti-commodity'). Rather, animals were grazed while young, and later fattened on farm waste, such as the leaves and stalks of the region's peanuts and sweet potatoes, prior to sale and slaughter.⁶⁹ Known for their size and strength, Shandong cattle had long been sold as draft animals to inland provinces like Henan and Shanxi, although they do not seem to have reached the Beijing market, which was still primarily served by the overland trade of sheep and beef from Mongolia.⁷⁰ But especially when mixed with imported German breeds, Shandong cattle were excellent beef animals, and, like the herds of the Hulunbuir grasslands, were known and prized for their taste.

⁶⁵Chikusan Shinkō Jigyōdan, *Gyūniku no rekishi (History of beef)*, Tōkyō: Chikusan Shinkō Jigyōdan, 1978, pp. 7–17; *Trans-Pacific*, 4, January–June 1921, p. 63; *Japan–Manchoukuo year-book: cyclopedia of general information and statistics on the empire of Japan and Manchoukuo*, Tokyo: Japan-Manchoukuo Year-Book Co., 1934, p. 372. I am grateful to Rotem Kowner for leading me to this information.

⁶⁶JACAR, B07091158200, 'Nisshin seneki no sai gunjuhin kyōkyūhō gaikokujiin yori mōside zakken (Foreign sourcing of military provisions during the Sino-Japanese War)', 1894.

⁶⁷*Seitō jitsugyō kyōkai geppō (Monthly Bulletin of the Qingdao Chamber of Commerce)* (henceforth COC), September 1918.

⁶⁸COC, October 1918; R. C. Forsyth, *Shantung: the sacred province of China in some of its aspects*, Shanghai: Christian Literature Society, 1912, pp. 114, 119. This source mistakes total production figures for beef.

⁶⁹JACAR, B06050487000, 'Seitō shi ni okeru shiryō shigen chōsa ni okeru hōkokushō (Report on investigation of feed resources in Qingdao)'; Harro Maat, 'Commodities and anti-commodities: rice on Sumatra 1915–1925', in Francesca Bray, Peter A. Coclanis, Edda L. Fields-Black, and Dagmar Schäfer, eds., *Rice global networks and new histories*, New York: Cambridge University Press, 2015, pp. 335–54.

⁷⁰COC, December 1918. T'ien-p'ei Meng and Sidney D. Gamble, *Prices, wages and the standard of living in Peking, 1900–1924*, Beijing: Peking Express Press, 1926, p. 36.

Table 4. Qingdao slaughterhouse tally by animal (head), 1908–18

	Cattle	Calves	Pigs	Sheep
1908	5,283	1,391	7,383	2,020
1909	5,324	2,052	8,228	2,067
1910	7,121	2,267	9,329	2,215
1911	7,423	2,932	8,067	3,240
1912	12,004	2,097	11,486	2,853
1913	24,470	3,114	3,765	3,044
1914	17,705	2,825	9,227	1,841
1915	8,135	214	5,319	276
1916	15,140	107	6,229	405
1917	25,672	55	6,702	400
1918	36,675	35	8,856	764

Sources: COC, October 1918; COC, February 1919. 1914 figures differ between the two sources.

Live animals, raised by farming households, and purchased by Chinese agents in cattle markets in Ji'nan and Jining were carried by rail to Qingdao, whence fresh or preserved beef was shipped to destinations along the coast. As with Harbin, military provisioning during the First World War produced a sharp spike in demand, particularly as a replacement for Australian beef. In 1913 alone, 90,000 quarters (that is, 22,500 dressed carcasses) were shipped via Qingdao to Russian troops in Vladivostok.⁷¹ A 1915 petition for harbour passage by an investor who had contracted an American refrigerated steamer to deliver 1,000 beef carcasses each month from Qingdao slaughterhouses to Tianjin, Dalian, Vladivostok, and Nikolaevsk confirms that an extensive, albeit irregular coastal trade continued to flourish during the war.⁷²

Following the war, Qingdao beef exports found a new market provisioning frozen beef to American troops in Manila. Until the late nineteenth century, Manila had consumed locally raised cattle. During the 1880s, the city began introducing live animals from Indochina and China, carelessly sourced imports that brought with them waves of rinderpest. In his recent book, Daniel Doepfers discusses the great efforts that the Philippine Bureau of Agriculture exerted to insulate the native herd from this extremely destructive disease, including the introduction of mandatory veterinary quarantine, fencing off infected areas, and switching to safer Australian imports.⁷³ For human consumption, the safest option was simply to import frozen meat. In 1898, the US garrison contracted with the Queensland Meat Export Company for an annual shipment of dressed meat that in 1910 totalled 250,000 pounds of beef, pork, and rabbits, plus 8,000 lamb and mutton carcasses.⁷⁴ Even more than in Vladivostok, the disruption of shipping by disease and war wrought havoc on food imports, not only those from Australia but also regional supplies such as rice from Bangkok and Saigon. Prompted first by sanitary restrictions, Manila's 'beef famine' provided a golden opportunity for Chinese producers. In 1916, an American merchant named William Katz contracted Qingdao slaughterhouses to supply 600,000 pounds of beef, which were to be shipped to Manila on the *Warren* and the *Merritt*, two navy transport ships that the American government had recommissioned for use as merchant freighters. Beef shipments to Manila, always carried frozen on these two ships, would continue for the next few years.⁷⁵

Rather than competing for the Manila market, the Vestey's southern venture briefly made profitable exports to Britain. During the war, the original Nanjing works moved increasingly into

⁷¹Shantung beef, [US] *Daily Consular and Trade Reports*, 3, 1914, p. 94.

⁷²JACAR, C03024532300, 'Reisōzen "Hanametto" gō Seitō deiri no ken (Concerning the entry and exit of the cold storage ship *Hammamet* from Qingdao)', 1915.

⁷³Daniel F. Doepfers, *Feeding Manila in peace and war, 1850–1945*, Madison, WI: University of Wisconsin Press, 2016, pp. 233–50.

⁷⁴Critchell and Raymond, *History of the frozen meat trade*, pp. 239–40.

⁷⁵Doepfers, *Feeding Manila*, pp. 245–6; COC, July–October 1918, August 1919, April 1921; *Straits Times*, 13 January 1913; *Singapore Free Press and Mercantile Advertiser*, 21 November 1913. On the repurposing of American transport capacity, see *Malaya Tribune*, 29 August and 4 September 1914.

beef production, buying Shandong cattle, which were purchased and slaughtered in Ji'nan, before being transported in refrigerated rail cars to Nanjing and thence to Shanghai for export. At the height of the wartime boom, a portion of these exports did indeed reach the British market. But the amounts were negligible, peaking in 1918 at roughly 10,000 tons (just 3% of Britain's frozen beef total imports), and falling off immediately after the war's end.⁷⁶ Moreover, such actions turned local authorities against the firm, which in 1915, was reprimanded for illegally purchasing 22,000 draught cattle across thirteen counties. The cost of such antagonism became apparent during the 1920s and 1930s, when a combination of boycotts, famines, and floods prompted Chinese authorities to ban 'treacherous foreign merchants' (*wai lai jian shang*) from shipping beef cattle or beef by rail. The same railways gave special discounts for shipping work cattle to afflicted areas.⁷⁷ Nor was the Nanjing operation able to expand into the nearby Shanghai market, which continued to be served largely by traditional means: Chinese middlemen purchased live animals at monthly cattle markets in places such as Danyang, just over 200 kilometres to the north-west, and shipped them into Shanghai for slaughter and sale in the city's wet markets. Even the superbly efficient Vestey operation would have been hard pressed to compete with this low-cost source. By the 1920s, Vestey enterprises in Nanjing and Hankou had returned to their original, and more profitable, business of egg and poultry processing.⁷⁸

At that time, the Qingdao beef industry had not yet turned decidedly to Japan. The many Japanese companies that bought, slaughtered, and exported Shandong beef were not simply the foot soldiers of extractive imperialism; Japanese enterprises often incorporated significant amounts of Chinese merchant capital, and most on-the-ground operations were effectively Chinese-run. It took a combination of factors for these ventures to focus exclusively on Japan. The first was a shift in other export markets. Fresh meat exports to Vladivostok were high through the war, but with the combination of peace and collapse of the rouble, these fell by more than half between 1918 and 1919 (from roughly 9 million kg to 4.4 million kg). Australian imports to Manila resumed in 1921, and the last Qingdao shipment of beef seems to have been in June of that year. The last shipment to Vladivostok was just one month later. However, transshipments from Hong Kong and other ports maintained China as the largest source of meat imports to the Philippines for at least another decade.⁷⁹

New opportunities in Japan were made possible by an increase in refrigerated shipping capacity. The Manila market had relied on American refrigerator ships, while Vladivostok either used American ships, shipped live cattle or fresh meat in the winter, or exported salted meat in the warmer months. Lacking refrigerator ships, Japanese exporters, most of which were small-scale concerns, had tried without success such expedients as preserving fresh meat with sulphurous acid, or trying to win Japanese consumers over to salted meat. Japanese ships began cold-season shipments of fresh beef late in 1918, producing a sustained (if seasonally inflected) rise in Japanese imports (see Table 5). Thereafter, a growing number of small Japanese-owned companies plied ships (seventeen sailings in December alone) with a carrying capacity of between 400 and 600 carcasses from Qingdao to Japanese ports in Osaka, Kobe, and Shimonoseki, a trip that could be repeated once every three days. In that month, Japan imported just over 10,000 beef quarters, marking the first time that more than half of all Qingdao exports went to Japan. By 1923, four Japanese refrigerator ships were making the passage, allowing for fresh meat exports all year round. From that point on, nearly all of Qingdao's rapidly growing beef export

⁷⁶China Maritime Customs, *Returns of trade*, 1915, vol. 3, p. 781; *Returns of trade*, 1919, vol. 1, p. 801. George E. Putnam, *Supplying Britain's meat*, London: George G. Harrap, 1923, p. 157.

⁷⁷Jiangsu gongbao (*Jiangsu Political Bulletin*), 1915, pp. 487, 971; *Tielu xiehui huibao* (*Railroad association bulletin*), 99, 1, 1920; *Tielu xiehui huibao*, 116, 1922; COC, May 1918 and December 1918; *Shiye gongbao* (*Enterprise Bulletin*), 35, 1931.

⁷⁸Shanghai suoshi zhi Danyang niurou (Danyang beef eaten in Shanghai), *Xinghua* (*Rising China*), 24, 16, 1927.

⁷⁹Doeppers, *Feeding Manila*, pp. 245–6; Ninomiya Yuzuru, *Bei-Hi kan jiyū tsūshō bōeki mondai to Hirippin Guntō kokusai bōeki no sūsei ni tsuite* (*Problem of US–Philippines free trade and the direction of commerce in the Philippine archipelago*), Yokohama: Yokohama Specie Bank, 1932, p. 52.

Table 5. Destination of Qingdao beef exports (in quarters), 1916–20

	Japan	Vladivostok	Dalian	Shanghai	Manila	Total
1916	196	18,739	1,564	394	16,435	37,328
1917	2,204	17,944	2,791	338	15,244	38,521
1918	28,623	65	2,456	520	55,995	87,659
1919	54,365	40,090	3,773	425	62,308	160,961
1920	103,266	20,779	3,386	285	44,905	172,621

Source: COC, April 1921.

went to Japan, with a mere fraction of a per cent reaching Dalian and Shanghai. In 1925, Japan received all but 66,420 kg of the 11.7 million kg of frozen meat exported by the port.⁸⁰

Beef imported from Qingdao occupied a particular niche in the Japanese market. Japan had already spent decades aggressively expanding its national herd, and produced much more than it imported. In part to protect domestic industries, the Qingdao product was often portrayed as inferior to Japanese beef (a group of Japanese butchers was prosecuted in 1921 for passing off Qingdao beef as domestic), but still commanded nearly twice the price of beef imported from Vladivostok.⁸¹ Imports helped to bring beef within the reach of urban households. In 1920 Tokyo, 1 kg of lower-quality beef cost ¥1.40, roughly the same as ten domestic chicken eggs. While hardly cheap, beef was for many an attainable luxury.⁸² This price continued to fall after the Japanese government waived import duties on beef and eggs after the devastating Kantō Earthquake of 1923. In 1924 Hiroshima, the price of beef was 16% lower than it had been in 1921.⁸³

Coinciding with a devastating famine in northern China, this expansion of Japanese exports was hardly welcome. From 1921 to 1924, Japanese imports of Qingdao beef had doubled, to 60,000 head. Concerned that insatiable foreign demand would decimate the population of draft animals, one Chinese observer proposed moving the production of beef cattle to the northern grasslands, or the mountainous western frontier. A national law enacted in August 1923 aimed to limit production by levying separate taxes on slaughtering and sale of meat. While Chinese production of beef (including for its own domestic market) was never halted entirely, caps were placed on the number of animals that each slaughterhouse could process per day.⁸⁴

Partially in response to these pressures, Japanese producers began consolidating their efforts, just as the industry was coming under ever-greater political control. Beef exports out of Qingdao were parcelled out to thirty to forty small exporters, no one of which still controlled as much as 10% of the total market.⁸⁵ In 1924, most of these small exporters banded together to form the Qingdao Animal Husbandry Company (Seito saisaku kōshi). The following year, the Kobe Chamber of Commerce and Japanese consulate in Qingdao stepped in to mediate a dispute between the beef exporters and the shipping companies that provided refrigerated transport.⁸⁶ Political influence over the trade soon came to assume a more official quality, similar to the sort

⁸⁰China Maritime Customs, *Decennial reports, 1922–1931*, vol. 1, Northern and Yangtse Ports, Shanghai: Statistical Department of the Inspectorate of Exports, 1933, pp. 443–4.

⁸¹JACAR, B09041331200, ‘Seitō gyū yusyutsugyōsha yo funekaisha to no kakushitsu kankei (Antagonism between Qingdao cattle exporters and shippers)’, 1924, pp. 138–45; JACAR, B11092081800, ‘Shokuryōhin kankei’, pp. 81–2, 164–6; *Trans-Pacific*, 4, February 1921, pp. 93–5.

⁸²JACAR, B11090356700, ‘Nichijō seikatsuhin kakaku chōsa ichi ken (Investigation into the price of daily use items)’, 1920.

⁸³COC, June 1924.

⁸⁴Shandong niurou chukou qingkuang (State of Shandong beef exports), *Yinhang yuebao (Banking Monthly)*, 3, 2, 1923; *Jingshi shuiwu yuebao (Capital Taxation Monthly)*, 2, 1923, pp. 712–3. The 1928 figure comes from ‘Feilubin zhengfu de weisheng gonggao (Sanitary pronouncements of the Philippine government)’, *Jiyanan yuebao (Inspection Monthly)*, 20, 1931, pp. 65, 66 (on complaints against operating businesses).

⁸⁵COC, December 1923.

⁸⁶JACAR, B13081541500, ‘Seitō gyūniku tsumitori mondai (Problem of beef acquisition in Qingdao)’, 1929.

of private–state hybrid companies that dominated Japanese trade in tea, flour, and other key commodities. This level of influence allowed beef exports to continue to expand, even as tensions with China mounted. By the early 1930s, the time of the surveys shown in Table 1, Qingdao was producing 75% as much beef as Shanghai, a massive international city that was roughly seven times larger.

Trade transformed dramatically in September 1931, when the Japanese garrison in Dairen initiated a three-month assault to capture Manchuria. This act, and the subsequent establishment of the Manchukuo client state, made Japan an international pariah, but also solidified Manchuria as a dedicated and captive trade partner for numerous commodities, including beef imports. Earlier that year, as floods wrought havoc across five provinces, the Chinese government had continued to reiterate its ban on live cattle and beef exports. One such announcement, specifically directed at the north-eastern provinces of Heilongjiang and Jilin, was released on 16 September, just two days before the sudden commencement of hostilities.⁸⁷ The beef ban was repeated five days later but, unsurprisingly, at that point there was little hope of compliance. The Qingdao slaughterhouses were made exempt from the ban, technically because they were joint investments, and a source of foreign income.⁸⁸ After the ban, they continued to operate, and remained Japan's primary source of beef imports. Japanese-controlled Korea and Manchukuo also emerged as major, and strictly dedicated, exporters of beef to the home islands. Measured in tax revenue, nearly all of the chilled meat exported from Manchukuo in 1932–33 was shipped to Japan. Of all of the new nation's many resource exports, approximately 31% of which went to Japan, only the trade in meat was so concentrated.⁸⁹

No one road: the many faces of commodity globalization

China was a minor but hardly insignificant player in the global transformation of beef. There are no reliable statistics for the country's total domestic production, but at the height of the South American beef boom in 1919, the single city of Qingdao exported about one-thirtieth as much beef as the entire nation of Argentina. Tallies from urban slaughterhouses in the 1930s confirm that Chinese beef production was substantial. Extrapolating these figures out to rural areas, where the vast majority of Chinese people lived, suggests that the industry may have indeed been one of the world's largest.⁹⁰

But the significance is not in the numbers. From a global perspective, China's beef industries were connected to the Atlantic revolution in meat production, but in many ways remained aloof from it. Beyond the amount of beef produced, sold, and consumed, production out of China shows the same forces that shaped this better-known trade in a very different setting. The three stories presented here span roughly the same period, and contain many of the same elements, as the Atlantic transformation, including the late nineteenth-century transition from live trade to industrial slaughter and refrigerated transport, the explosion of investment in the two decades before the First World War, and political adjustments in the years that followed. The three production chains, shown together in Figure 3, span three successive modes of transportation: droving, rail, and oceanic shipping. Together they introduce a familiar set of forces: new technologies, domestic and foreign capital, and a range of strategic and political considerations, including policies intended to protect herds, stabilize border populations, monopolize production and import under state auspices, and procure meat for military and civilian populations.

⁸⁷ *Shiye gongbao*, 4, 25, 1931; *Shiye gongbao*, 1, 22, 1931; *Shiye gongbao*, 40, 1931.

⁸⁸ *Nongye zhoubao (Agriculture weekly)*, 1, 22, 1931, p. 687.

⁸⁹ JACAR, A08072530100, 'Manshūkoku shuyo yushutsuhin (yūzeihin) kunibetsu yushutsu gakuhyō narabini koreni tai suru yushutsu zeiritsu gairanhyō (Important exports of Manchukuo chart of (taxable) exports by nation and export tax)'; *Japan-Manchoukuo year-book*, 1934, pp. 500, 529.

⁹⁰ Jones, 'Argentine refrigerated meat industry', p. 116. The author's current research aims to produce estimates of production and consumption in Republican China.

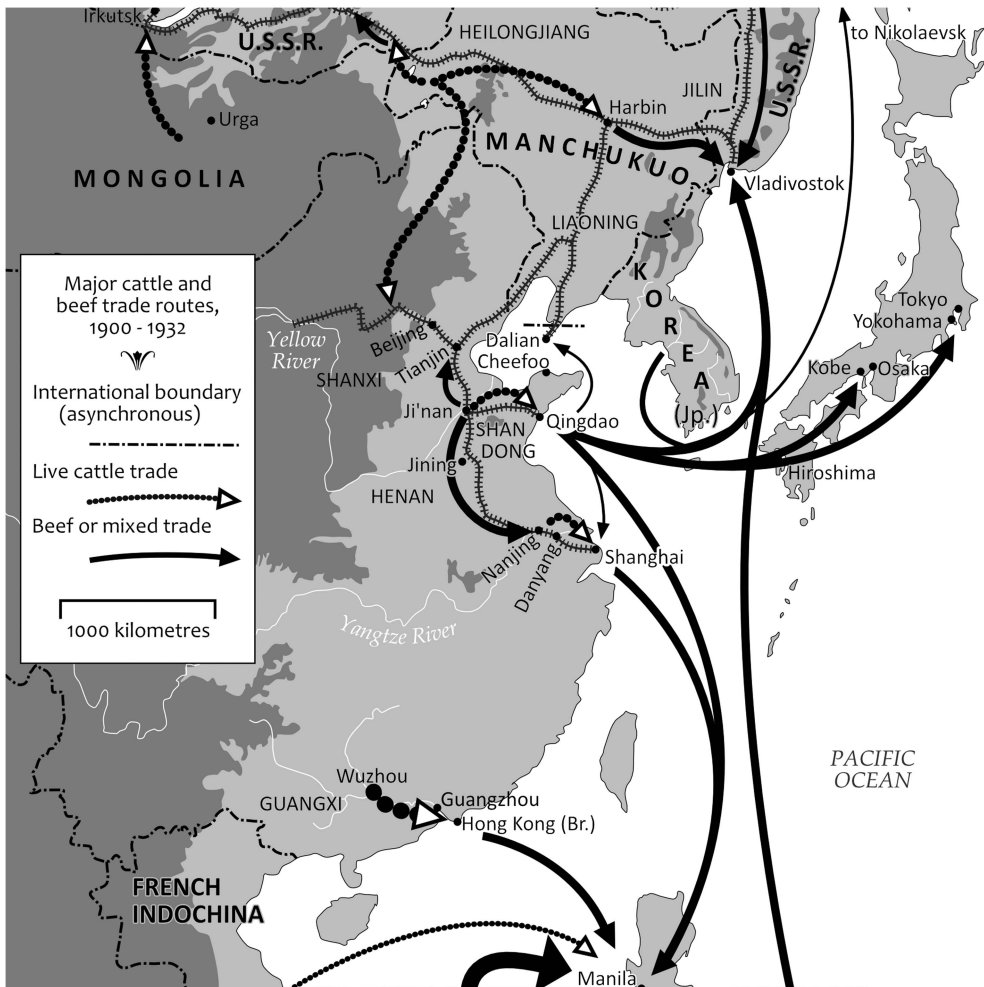


Figure 3. Major cattle and beef trade routes, 1900–32. Map by Thomas DuBois.

The differences are at least as important. While export-oriented producers like Argentina and Australia developed smooth point-to-point chains that connected interior pastures to finishing, slaughtering, refrigeration, and shipping industries on the coast, Chinese production was more like a web, composed of individuated production chains that moved both live and processed animals to different internal and external markets. The diverse nature of Chinese production, and quick turnover of new markets, brought competition of all sorts. The global players that fought to control exports in South America or Australia were unable, or perhaps uninterested in trying, to dominate Chinese exports. In both Harbin and Nanjing, Vestey enterprises remained only one among many players, and no other globally significant producer of the time made deep inroads into the coastal trade. Japan’s successful domination of the Qingdao trade was less a function of productive efficiency than the willingness to use political clout, and eventually the road of open military aggression, to secure its many interests on the continent. If the Atlantic beef trade is a lesson in globalization, the Chinese one is a lesson in the inflection, and ultimately the limits, of those forces.

From a commodity chain perspective, the story of Chinese beef confirms Timothy Sturgeon's caution against over-generalizing the forces that shape intermediation within an industry.⁹¹ Simply put, there is no single, axiomatic nature that governs the historical development of the beef industry, in China or elsewhere. Even these three production chains exhibited remarkable diversity in how their product was made and brought to market. In the caravan trade, the purchase of live cattle was entirely buyer-driven, the time and terms of trade dictated solely by the Shanxi merchants, who held a monopoly trade in vital goods. In contrast, the beef trade was less visible because it was less distinct: cattle brought to the interior were traded in a series of markets, where they were mixed in with other animals, and sold for labour and transport, hides, and meat. Competition from cross-border Russian merchants, and later by the Harbin meat-packing industry, greatly raised the bargaining power of the pastoralists, but advantage still lay with the modern producers, who had the capital and connections to bring a superior product to new consumers in Vladivostok and eastern Russia. The Japanese industry in Qingdao was different again. Initially characterized by the decisive influence of entrepreneurial intermediaries such as William Katz, Qingdao became a captive node of the politically dominated supply chain to Japan. The three production chains were not merely geographically distinct, but their fundamental differences also encapsulate important evolutionary phases in an industry that maintained a distinct regional presence, neither global nor a casualty of globalization.

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⁹¹Timothy J. Sturgeon, 'From commodity chains to value chains: interdisciplinary theory building in an age of globalization', in Jennifer Bair, ed., *Frontiers of commodity chains research*, Stanford, CA: Stanford University Press, 2009, pp. 110–35.