VICTOR L. MOTE

The Cheliabinsk Grain Tariff and the Rise of the Siberian Butter Industry

A score of years ago geography was characterized as spatial interaction, the underlying concepts of which were complementarity, intervening opportunities, and distance.[1] Without additional consideration of the first two, the last of these concepts is intrinsic to this study. According to Ullman, distance, which may be interpreted in many ways, is measured economically, that is, in terms of the cost and time involved in transporting a product. A good is transportable only when its inherent value is sufficient to overcome the "friction" of distance. Hoover states this clearly: "When goods of high value per pound are shipped, the transfer charge constitutes a smaller relative addition to the total cost of the delivered article, and such goods are said to be 'more transportable' or to be capable of bearing a higher transfer charge."[2] Thus, whenever the shipment of a product over a given distance by a certain mode of transportation becomes relatively unprofitable, it is reasonable to expect that the item will be substituted against or supplemented by another, more transportable, good. Cargoes which are perishable, dangerous, or fragile, requiring special handling and entailing extra cost, or items which are bulky and cost more per ton to carry than compact or easily stowed goods are no match for high-value freight. For example, other things equal, it makes no sense to continue shipping wheat from South Africa to London if a handler has the opportunity to transport diamonds.

The rise of the Western Siberian butter industry between 1896 and 1913 and the implementation of the Cheliabinsk Grain Tariff occurred almost simultaneously. Applying the concepts of economic transportability and substitution, it seems plausible to argue that the Siberian butter industry's growth was directly related to increased use of grain for cattle feed, as westward grain shipments from Siberia decreased in response to the Cheliabinsk Tariff "break." However, this paper will attempt to show that, although the Cheliabinsk Tariff "break" certainly influenced the growth rate of the Siberian butter industry, numerous other factors were equally, if not more, important to the rapid development of this industry between 1896 and 1913.

1. E. L. Ullman, "Geography as Spatial Interaction" (Abstract), *Annals of the Association of American Geographers,* 44 (1954):283–84.

2. E. M. Hoover, *The Location of Economic Activity* (New York, 1963), p. 25.

After 1890 the eastward migration of Russian and Ukrainian peasants reached unprecedented proportions. Between 1890 and 1895, almost 350 thousand migrants arrived in Siberia, exceeding the total for the previous decade.[3] With the Trans-Siberian Railroad nearing completion and over 95 percent of Siberia's rapidly expanding population of some three million working the land, the commercial landowners of Central Russia, already hurt by competition from the recently cultivated steppes of New Russia and the Volga Basin, envisioned the potentially huge volume of marketable Siberian grain as a further threat to their stake in the internal market. The fear that new injections of grain would cause a massive price decline on a market which normally reflected prices 10 to 40 percent below the going international rate was the principal impulse behind the establishment of the Cheliabinsk Tariff "break."[4]

The "break" was actually an alteration of the freight rate structure imposed by the tsarist government on westward shipments of Siberian grain. Under the system which existed prior to 1896, long-distance haulage of produce from Siberia to European Russia was generally favored by a decrease in the ton-mile rate. With the imposition of the Cheliabinsk Tariff this system was "broken" into two medium hauls at Cheliabinsk, a city on the Trans-Siberian Railroad near the eastern slopes of the Ural Mountains. Some 50 to 75 percent of the total cost of Siberian wheat in the Baltic or Black Sea ports may have been represented by transport charges, exclusive of expenditures for delivery to the railway pickup points in Siberia, and the costs directly attributable to the "break" varied between 4 and 9 kopecks per pood, or roughly 5 to 10 percent of the total transport expense.[5]

For eighteen years, until its total abrogation in 1913, the Cheliabinsk Tariff was viewed as a thorny obstacle to the satisfactory marketing of Siberian grain. Opinions were and are divided over the impact of the barrier, primarily because effective analysis is hindered by multiple intervening variables: railway construction throughout the period (the Trans-Siberian reached the Ob nearly simultaneously with the imposition of the tariff, and the Omsk-Tiumen' line was completed the same year it was lifted); devastating famines in 1900, 1901, 1902, and 1911; the Russo-Japanese War (1904–5); riots in European Russia (1905–7) and consequent inflated market conditions (1906–9); massive migration throughout the period; and the relatively restricted capacity of the railway. All of these factors militate against simplified

3. "Sibirskaia zheleznaia doroga," *Entsiklopedicheskii slovar'*, vol. 58 (1900), p. 738.

4. Charles Jonas, "Russian Railroads and the Grain Market," *Consular Reports*, 1894, no. 46, pp. 183–85.

5. L. M. Goriushkin, *Sibirskoe krest'ianstvo na rubezhe dvukh vekov* (Novosibirsk, 1967), p. 276; and S. V. Vostrotin, *Severnyi morskoi put' i Cheliabinskii tarifnyi perelom* (St. Petersburg, 1908), p. 30.

explanations of the effectiveness of the tariff. Nearly everyone agrees, however, that artificially high transport rates were prejudicial to the sale of Siberian grain in European Russia. An important secondary source avers that, because of the poor grain procurement prices, Siberians were compelled to process their produce at local distilleries, breweries, and other enterprises. Indeed, by 1908, approximately 80 percent of all Siberian manufacturing was related to the food industry.[6]

But not all of the grain, some 40 to 50 percent of which was wheat, could be disposed of on the Siberian market. Some had to be shipped westward, even though prices were unfavorable. Goriushkin estimates that the commercial grain surplus of the two most important Siberian provinces, Tomsk and Tobol'sk, averaged about 26 percent of the total harvest.[7] In better than average years this percentage might have reached 35 percent, and during famines it would have fallen below 20 percent. Averages for gross harvests are known: 158 million poods for 1901–5; 204 million poods for 1906–10; and 270 million poods for 1911–15.[8] Assuming commercial grain percentages of 24, 46, and 26 percent for the foregoing periods, respectively, ratios of regional (intra-Russian) exports of Siberian grain to regional grain surpluses may be derived.[9] The results, in millions of poods, follow:

	Regional Exports (E)	Regional Surpluses (S)	E/S
1901–1905	11.7	38.0	31 percent
1906–1910	49.0	93.0	53 percent
1911–1915	56.1	70.2	80 percent

If these estimates are realistic, they indicate that the Cheliabinsk Tariff was quite successful in restricting Siberian grain shipments. Some 80 percent of the commercial grain was exported regionally between 1911 and 1915, after the tariff was finally abolished. Theoretically, then, in the two previous five-year periods, as much as 2.6 times more grain might have been transported westward had there been no "break."

6. A. P. Okladnikov et al., eds., *Sibir' v epokhu kapitalizma*, vol. 3 of *Istoriia Sibiri* (Leningrad, 1968), pp. 188 and 198.

7. Goriushkin, *Sibirskoe krest'ianstvo*, pp. 147–48.

8. N. P. Oganovskii, *Sel'skoe khoziaistvo Rossii v XX veke: Statisticheskii sbornik* (Moscow, 1923), pp. 170–73, 196–97.

9. The exports are given in table 1 (see p. 313). The percentage for the period 1901–5 was based on two famine years, a bumper year, and two average years. The figure for the years 1906–10 was found in P. P. Rumiantsev, "Torgovlia, promyshlennost', kredit," in *Aziatskaia Rossiia*, 2 vols. (St. Petersburg, 1914), 2:420. Seemingly high, this percentage may be the result of good weather (note the lack of famines) and the good marketing conditions brought on by the chaos in European Russia between 1905 and 1907. The final percentage was computed on the basis of one famine (1911), three average years, and a bumper year (1915).

By 1910, the need for the tariff was questioned by many government officials, including Prime Minister Stolypin, who contended that the fears of European Russia's commercial landowners were unfounded.[10] Stolypin claimed that even without the "break," prices of Siberian grain would have been too high because of normal transport costs—unless the produce appeared on the market en masse. He also stated that the latter contingency would, in any case, have been precluded by the lack of capacity and the inefficiency of the Trans-Siberian Railroad.

The inadequate capacity of the railroad was, undoubtedly, a major deterrent to grain shipments. Descriptions of grain rotting on railway embankments for lack of carriage space and tables illustrating excessive demand may be found in the available literature.[11] It may very well be, as Stolypin contended, that unsalable Siberian surpluses were attributable more to a lack of railway capacity than to the Cheliabinsk Tariff.

The Ministry of Trade also argued cogently against the tariff, pointing out that the Central Russian landowners grew chiefly rye, whereas the Siberians shipped wheat almost exclusively.[12] Authorities also suggested the construction of new roads by which to disperse the alleged massive volume of Siberian grain. Their proposals included the creation of a northern railway from Archangel to the lower Ob, to which grain could be transported from upstream locations.

The decision to abolish the barrier was undoubtedly a difficult one, not so much because of the possible human hardships that might ensue, but because the government itself derived a substantial income from it. For every twelve million poods of Siberian grain entering European Russia the treasury received one million rubles.[13]

The lifting of the tariff finally came on August 1, 1910. It was to disappear in three stages: 40 percent in 1911; 30 percent in 1912; and 30 percent in 1913.[14] The results were generally favorable to the grain trade. Regional exports of grain in 1911, though hindered by famine, were 29 percent higher than those of 1910. During the following year, with a better harvest and a 40 percent lower freight rate, shipments increased another 45 percent. Finally, in 1913, with 70–100 percent of the duties lifted, and aided by the completion

10. P. A. Stolypin and A. W. Kriwoschein, *Die Kolonization Sibiriens: Eine Denkschrift* (Berlin, 1912), p. 127.

11. T. S. Khachaturov, *Razmeshchenie transporta v kapitalisticheskikh stranakh i v SSSR* (Moscow, 1939), p. 471; and *Plan zheleznodorozhnogo stroitel'stva v Sibiri na blizhaishee desiatiletie* (Petrograd, 1917), p. 44.

12. Okladnikov et al., *Sibir' v epokhu kapitalizma,* p. 315.

13. Goriushkin, *Sibirskoe krest'ianstvo,* p. 276.

14. L. F. Skliarov, *Pereselenie i zemleustroistvo v Sibiri v gody stolypinskoi agrarnoi reformy* (Leningrad, 1962), p. 497.

of the Omsk-Tiumen' railway, grain cargoes were an additional 7 percent greater than they had been in 1912.

Moreover, as a result of the removal of the tariff, there was a sizable increase in wheat acreage. During 1901–10, acreage expanded at an average annual rate of approximately 208 thousand acres. But between 1913 and 1916 the average annual increase exceeded 450 thousand acres even though migration to Siberia was far below the average for the previous decade.[15]

Marketing conditions also improved. By June 1914, the demand for Siberian wheat in famine-plagued provinces of European Russia had risen considerably. The Omsk Bourse was flooded with orders, and grain prices jumped 27 percent.[16]

During the first decade and a half of this century no development in the Siberian economy was more pronounced than the rise of the butter industry. Within a span of twenty years, Siberia, chiefly the southern portions of Tobol'sk and Tomsk guberniias, was transformed from a region producing only clarified butter (*toplennoe maslo*) into the world's second largest producer of modern butter (*slivochnoe maslo*).[17] Between 1894, when the first successful creamery was established roughly thirty miles from Kurgan in Tobol'sk guberniia, and 1913, when no less than 4,000 butter-making concerns were operating in the region south of the taiga and west of the Yenisei River, exports of "Siberian Butter" to foreign countries rose from zero to 62.1 thousand tons, second only to the 87.7 thousand tons exported by Denmark.[18]

From 1870 to World War I, with ever-increasing quantities of grain from Russia and other countries flooding the international markets, the economies of the world witnessed a shift in price relationships which favored livestock products at the expense of foods of vegetable origin. Although prices in general tended to fall as a result of agricultural depression in many parts of the world, the price of wheat decreased by more than one-half as the price of butter and bacon fell by only one-fourth.[19] Consumers, especially in Britain, whose standard of living was on the upswing and whose diets were becoming more

15. E. S. Karnaukhova, *Razmeshchenie sel'skogo khoziaistva Rossii v period kapitalizma (1860–1914 gg.)* (Moscow, 1951), p. 92; and Okladnikov et al., *Sibir' v epokhu kapitalizma,* p. 315.

16. Skliarov, *Pereselenie i zemleustroistvo,* p. 495.

17. A. A. Kallantar', "Molochnoe khoziaistvo," *Aziatskaia Rossiia,* 2:331–38. The establishment of two creameries processing *slivochnoe maslo* prior to 1894 is reported in several sources, but these units apparently produced only for local consumption. The first continuous record of exports of Siberian butter dates from 1894.

18. V. Ershov, "Maslodelie," *Sibirskaia sovetskaia entsiklopediia,* vol. 3 (1932), p. 314.

19. E. F. Nash and E. A. Attwood, *The Agricultural Policies of Britain and Denmark: A Study in Reciprocal Trade* (London, 1961), p. 19.

sophisticated, were chiefly responsible for the relative change favoring meat and dairy products.

In Denmark, perhaps the first nation to respond to this change, crop sales, which had represented over one-half the income of farmers in the 1870s, fell, by 1910, to approximately one-seventh of total proceeds. More than one-half of farm income was derived from animal husbandry, principally from the marketing of butter.[20] By the turn of the century Denmark had become the world's "butter maker *par excellence*." Danish dairying techniques were the envy of the world. Even in countries where butter was produced economically with less milk per unit of butter output, the cost of the home product was greater than for imported Danish butter.[21]

As the teachers, the Danes were rewarded with footholds in the dairy industries of their students. For example, long before the first Siberian creamery sold *slivochnoe maslo* for regional export, the Danes had surveyed the Siberian potential for butter marketing and trade. By the time the railroad reached the Ob, Danish firms were already buying butter, selling machinery (on credit against future butter production), and instructing creamery employees. The Danes, at least initially, imported a substantial portion of Siberian butter exports, and so much that, in the heat of competition, they were frequently accused of changing the labels of Siberian kegs and reshipping them as "Danish Domestic." Such accusations were not surprising, for in 1906 Siberian butter sold in Britain at 21 cents per pound, four cents cheaper than Danish butter, making it the most inexpensive on the market. It was the only butter that British workingmen could afford.[22]

Gradually other foreign firms followed the Danes' example. British and German representatives soon had offices in every major town in Western Siberia. For example, in Omsk and Novonikolaevsk, which only a decade earlier had been unsung villages, there were fourteen and twenty offices respectively. Thus, foreign firms seized a large share of the profits of the butter trade, something on the order of 2–2.5 rubles per pood, or a total of 80–150 million rubles between 1894 and 1913.[23]

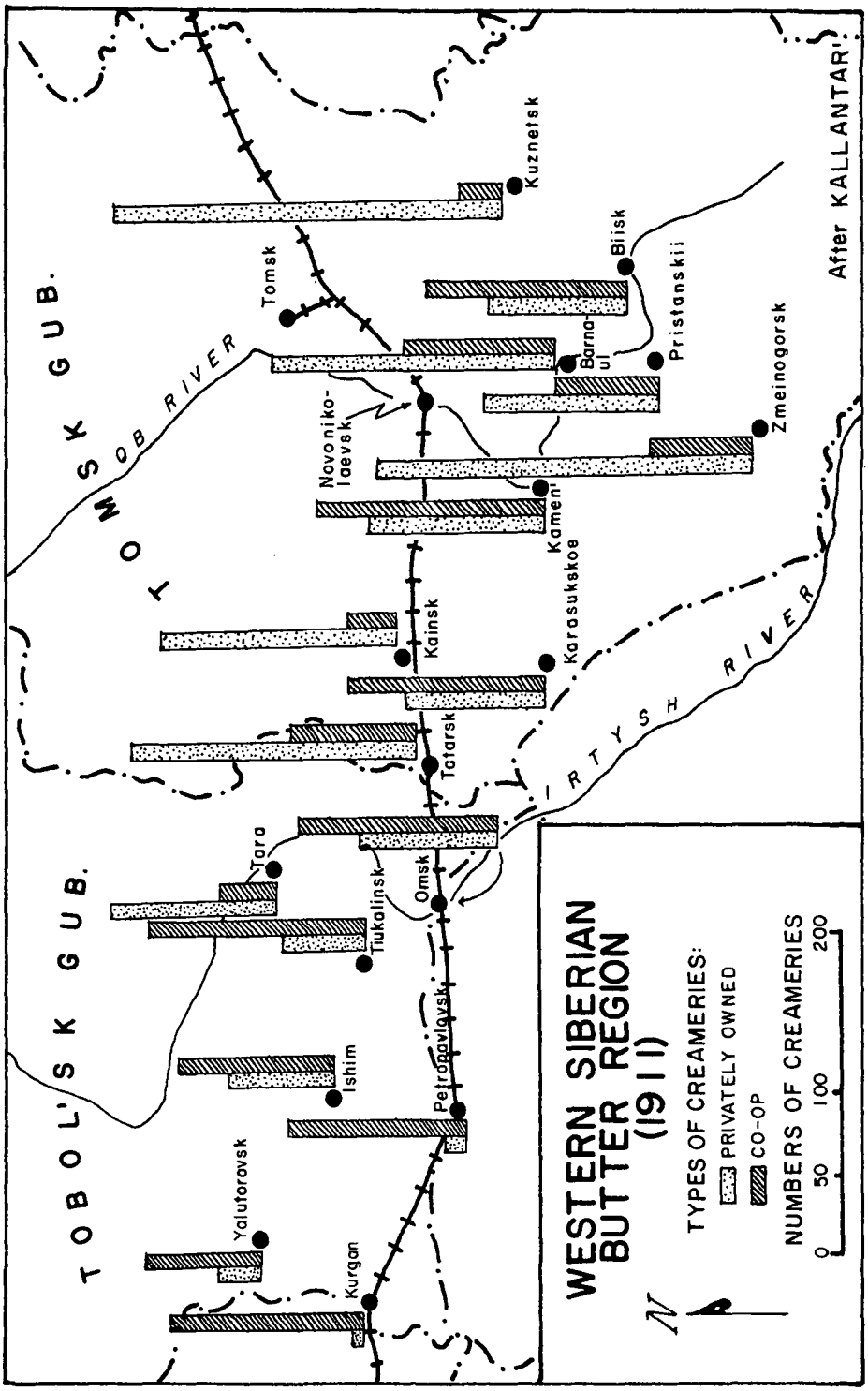
From the outset, of course, some of the wealthier and more independent Siberian dairymen recognized the advantage of shipping their butter without going through foreign middlemen. They were harbingers of a movement that ultimately controlled more than 70 percent of the commodity. By 1907, there

20. Ibid., p. 21.

21. Rufus Fleming, "United Kingdom: Danish Versus British Butter," *Consular Reports,* 1909, no. 3, p. 104.

22. "Alleged Use of Danish Labels on Siberian Butter," *Consular Reports,* 1907, no. 5, pp. 57–58, and "United Kingdom—Butter and Cheese Imports for Two Years," *Consular Reports,* 1907, no. 3, p. 43.

23. Goriushkin, *Sibirskoe krest'ianstvo,* pp. 190 and 192.



were some 760 *artel'* creameries sponsored by more than 50 thousand farms with nearly 280 thousand cattle. Most of the creameries were, however, still partially dependent on foreigners. Unification of these enterprises was finally achieved with the formation of the Union of Siberian Cooperative Associations Ltd. (USCA) in which members purchased stock and shared maintenance and delivery costs in exchange for higher profits. USCA profits averaged 15 to 20 kopecks per pood, less than one-tenth the margin of its competitors. Because of its reasonable terms and efficiency, the USCA soon had offices in Berlin, London, Copenhagen, New York, and Boston.[24] Figure 1, besides showing the extent of the butter region, illustrates the relative importance of cooperative creameries in comparison with privately-owned operations in 1911. Note the increasing dominance of cooperatives as Kurgan, the birthplace of the Siberian cooperative movement, is approached (from the east). The idea continued to diffuse into the backwaters of Tomsk guberniia through the revolutionary period.

During the eighteen years that the Cheliabinsk Tariff "break" was in effect, exports of foods of animal origin—meat, eggs, and butter—increased considerably. At least one study suggests that low purchase prices for grain at the railheads in Siberia—a direct result of the tariff—may have prompted the peasants to hoard surplus grain and to feed it to local cows, thereby "converting grain to milk," which in turn was sold to nearby creameries.[25] Although some cheese was manufactured and marketed, butter was the principal commodity produced by the creameries, which were small, primitive, manually-operated enterprises averaging fewer than five employees. In addition to butter and cheese, the sale of meat and eggs for export also increased dramatically. Regional exports of meat (including cattle, hogs, sheep, and poultry) rose from roughly 2 million poods to 3.6 million poods, an increase of 180 percent in the period between 1900 and 1914.[26] Shipments of eggs soared from 134 thousand poods in 1901 to 362 thousand poods in 1910.[27]

Clearly, however, the most important item among Siberian shipments was butter. Between 1896 and 1913, the export butter market tended to be more stable than the grain trade—butter was more transportable than wheat, and

24. See A. D. Bilimovich, *Kooperatsiia v Rossii do, vo vremia, i posle bol'shevikov* (Frankfurt am Main, 1955), p. 26; and Goriushkin, *Sibirskoe krest'ianstvo*, p. 192.

25. N. E. Rogozin, "Vliianie sibirskoi zheleznoi dorogi na ekonomicheskoe razvitie Zapadnoi Sibiri v nachale XX veka," in *Uchenie zapadnogo Belorusskogo gosudarstvennogo universiteta imeni V. I. Lenina*, Seriia istoriia, 16 (1953), quoted in Goriushkin, *Sibirskoe krest'ianstvo*, p. 30.

26. S. S. Bazykin, "Sel'skoe khoziaistvo Sibiri i zaselenie," *Severnaia Aziia*, 3 (March 1929):45.

27. G. V. Glinka, ed., *Atlas Aziatskoi Rossii* (St. Petersburg, 1914), map 64.

was therefore a more valuable product.[28] Assessed at more than 60 million rubles in 1913, the value of exported Siberian butter was over twice that of exports of gold, three times as much as exports of wheat, and six times as much as exports of meat.[29]

On the surface it may seem that the development of the Western Siberian butter industry was a simple case of substituting butter for grain. The earlier estimates of some 2.5 to 3 times more grain available for export without the tariff would seem to imply that the tariff forced Siberians into butter-making and other subsidiary activities. However, facts indicate that the Siberian peasants did not feed the surplus grain to their cows. Prior to 1917, concentrated feed, such as mixtures of wheat and oats was distributed to no more than 5 percent of the animals, hardly sufficient to explain a thriving butter industry.[30] Furthermore, local Siberian market prices for grain remained comparatively high throughout the period, ranging from 72 to 84 kopecks per pood. This is in stark contrast to the arbitrarily low procurement prices of 30 to 32 kopecks per pood paid at the railheads.[31] Faced with such a choice, only the peasant who lived close to the railway and far from local markets would have opted to ship from Siberia. Apparently, then, most of the grain was sold locally, although there may be a question of whether or not it sold at a reasonable profit.

Comparison of statistics for regional exports of Siberian grain and butter indicates that both increased in volume during the period under study (table 1). Since expanded output could have resulted from the growth of population, the data have been reduced to per capita regional exports. For the concept of substitution to be satisfied, there need only have been a diversion from grain cargoes to butter cargoes. In other words, shipments of grain could have remained static or even risen in response to the tariff, but they should have done so as shipments of butter rose relatively.

The data in table 1 were subject to numerous intervening, distorting variables during the 1895–1915 period. In 1896, the year the "break" was imposed, the Trans-Siberian Railroad reached the Ob River, rendering less meaningful a comparison of shipments for that year with those of 1895. In 1900, 1901, 1902, and 1911, serious famines plagued the provinces of Siberia; thus, grain exports during those years were abnormally low. In 1904 and 1905, the Russo-Japanese War caused much of the Siberian grain to be shipped eastward, obviously unaffected by the tariff. Between 1905 and 1907,

28. Goriushkin, *Sibirskoe krest'ianstvo,* p. 163.
29. Skliarov, *Pereselenie i zemleustroistvo,* p. 503.
30. Goriushkin, *Sibirskoe krest'ianstvo,* p. 184.
31. Ibid., p. 29; and W. A. D. Jackson, "Tsarist Agriculture," unpublished manuscript, University of Washington.

Table 1. *Correlation of the Population of Western Siberia with Regional Exports of Grain and Butter (1895–1915)*

	Population Millions			Regional Exports (poods, millions)		Per Capita Regional Exports (poods)	
Year	Tomsk	Tobol'sk	W. Siberia	Grain[a]	Butter[a]	Grain	Butter
1895	—	—	3.13[b]	.60	.01[c]	.19	trace
1896	—	—	3.25[b]	13.00	.03[c]	4.00	.01
1897	1.93[d]	1.43[d]	3.36[d]	13.70	.05[c]	4.07	.01
1898	2.01	1.47	3.48	16.30	.16[c]	4.69	.05
1899	2.08	1.51	3.60	13.70	.31[c]	3.81	.09
1900	2.17	1.55	3.72	10.80	1.05[c]	2.90	.28
1901	2.25	1.60	3.84	—	2.20	—	.57
1902	2.33	1.64	3.97	2.80	2.40	.71	.60
1903	2.42	1.68	4.10	17.20	2.70	4.20	.66
1904	2.51	1.73	4.23	23.80	2.60	5.62	.61
1905	2.59	1.77	4.37	24.80	2.60	5.68	.59
1906	2.65	1.81	4.46	39.10	3.20	8.77	.72
1907	2.73	1.85	4.58	57.90	3.90	12.63	.85
1908	2.96	1.92	4.87	55.10	3.80	11.30	.78
1909	3.32	1.98	5.30	51.40	3.70	9.69	.70
1910	3.65	2.06	5.70	29.70	4.30	5.21	.75
1911	3.76	2.11	5.87	38.40	4.36[c]	6.54	.74
1912	3.86	2.16	6.02	55.80	4.67	9.26	.78
1913	4.00	2.21	6.22	59.70	6.01	9.61	.97
1914	4.14	2.27	6.41	45.70	3.53	7.13	.55
1915	4.28	2.34	6.61	81.30	3.80	12.30	.57

[a] L. M. Goriushkin, *Sibirskoe krest'ianstvo na rubezhe dvukh vekov* (Novosibirsk, 1967), pp. 76, 148, 162.

[b] Estimated on basis of 1897 census, natural increase of 2 percent per year, and net migration of 50,000 per year. N. V. Turchaninov, "Naselenie Aziatskoi Rossii," in *Aziatskaia Rossiia,* vol. 1 (St. Petersburg, 1914), p. 281.

[c] Exports abroad only; data for other years are regional exports.

[d] Frank Lorimer, *The Population of the Soviet Union* (Princeton, 1946), p. 27.

European Russian agriculture was disrupted by peasant riots, creating conditions which were more conducive to the import of Siberian grain not only in those years but in 1908 and 1909 as well. In 1911–13 the tariff was lifted; grain cargoes from Siberia should have risen and did. Also in 1913, the Omsk-Tiumen' rail spur was completed providing a shorter route to St. Petersburg and Riga; some of the record shipments of that period were carried on this route. Finally, when World War I began in late 1914, all of the Siberian grain surpluses could be used both domestically and at the front. In light of these facts, only five years during the period were without some kind of distorting variable: 1897–99; 1903; and 1910. Interestingly, with the exception of 1898, per capita grain exports in these years did decline from the totals for the years immediately preceding them, whereas exports of butter were up. However, this sample is obviously too small to formulate any final judgment.

When the entire twenty-year period is examined, a much less consistent picture is disclosed. Both types of per capita exports tend to rise and fall, inconsistently, with grain moving more sluggishly. In 1914 and 1915 there were sharp declines in butter shipments, and in the latter year grain shipments increased dramatically. These changes are explained, however, by the outbreak of World War I and the fact that the Russian army required the staple grain, which took priority on the railroad. As a less essential item, butter was sacrificed for the higher priority food. Danish importers tried in vain to transport the surplus butter via the Kara Sea route, but the attempt failed because of the brief navigational season in those waters and the wartime hazards beyond.[32] In short, formal statistical analysis of the data is frustrated by many covert elements, and the argument for or against substitution cannot be supported by quantitative evidence available.

Although the growth of the Western Siberian butter industry most certainly must have been accelerated by the Cheliabinsk barrier, several other factors also stimulated its growth. The international market situation and the cooperative movement have already been mentioned. Other important factors included: the abundance and quality of the grazing lands; the presence of a dominant breed of dairy cow well-adapted to the harsh continental climate of the region; the (clarified) butter-making tradition; the cheapness of Siberian labor; a new, vastly superior means of transportation (the Trans-Siberian Railroad) by which foreign capital, the separator, and primitive "refrigeration" were conveyed to Siberia; and, of course, the basic transportability of butter.

Between 1901 and 1910 well over half of the agricultural land of Western Siberia was natural grazing land.[33] Despite the fact that the turn-of-the-century settlers neither planted grass nor irrigated widely, the range of the region comprised one of the most prolific fodder bases in Russia and included such species as meadow grass, steppe timothy, couch grass, clover, and hundreds of other varieties of grasses and legumes.

Figures for 1955 show that 70 to 80 percent of the hay land of Kurgan, Omsk, and Novosibirsk oblasts consisted of "dry-valley" (*sukhodol'nyi*) meadows.[34] In terms of digestible protein, the Western Siberian variety of dry-valley meadow is over one-third more nutritious than the all-Union average for grassland of that type.[35] Though lacking in phosphorus, the vegetative cover

32. Jonas Lied, *Prospector in Siberia* (New York, 1945), pp. 165–66.

33. Oganovskii, *Sel'skoe khoziaistvo Rossii,* pp. 89 and 276.

34. V. S. Nemchinov, ed., *Kormovaia baza zhivotnovodstva SSSR i puti ee razvitiia* (Moscow, 1955), p. 128.

35. I. S. Popov, *Kormovye normy i kormovye tablitsy* (Moscow, 1955), p. 128.

of the region is infused with all the nutrients needed for a stable natural food base. Besides being well-endowed with calcium, carotene, and vitamin D, the high salt content of many of the soils of the region is a distinct advantage to livestock husbandry. Without a salt supplement, often deficient in natural dairy feeds, the animal's body stores are seriously depleted. Modern ranchers employ salt licks, but the Siberian peasant of 1900 undoubtedly did not.

In Asiatic Russia in 1910 there were two cows for every five persons. A local breed called "Siberian Cattle" (*Bos taurus primigenius*) was native to Western Siberia. Being small (660–680 pounds), these animals ate less, but fed adequately on the grazing lands of the region. Furthermore, because they drank little water and were protected from the harsh winter by a thick, furry hide, Siberian Cattle were well adapted to the environment. A very important characteristic of the Siberian cow is the fact that, despite her low yield per lactation (one ton), she rendered milk with a butterfat content of 4.5 to 7.6 percent. The European average at the time was 3.5 percent.[36] Because of its richness, only 19 pounds of Siberian milk were needed in winter and 22 pounds in summer for the production of one pound of butter. This compared to a ratio of 28-to-1 in Denmark and 25-to-1 in Great Britain. It was the low milk-to-butter ratio which helped make the Siberian commodity cheapest on the international market. Best of all, the Siberian cow could survive with very little attention, for new and old settlers alike traditionally paid little heed to the needs of their livestock.[37]

Butter-making was not unknown to Siberian settlers. For a century prior to 1895, clarified butter (*toplennoe maslo*), a primitive, whipped, later-melted product created from leftover sour cream, was manufactured by Russian peasants in Tobol'sk guberniia near Tiumen' and Kurgan. Typically, home-made clarified butter was sold to cattle dealers and then resold at the major city fairs in European Russia. In the mid-nineteenth century some of the product was being sent abroad, mainly to Turkey. By 1895, roughly 315 thousand poods of "Siberian (Clarified) Butter" were exported from Russia.[38]

At the turn of the century, cheap, abundant labor was one of the essentials of the dairy industry. In the early 1900s the annual wage of a skilled Siberian dairyman was approximately one-twelfth the salary of his Canadian counterpart.[39] Because the majority of Western Siberian creameries employed only two to three workmen, who frequently were exiles, labor costs were extremely low.

36. Bilimovich, *Kooperatsiia v. Rossii*, p. 25.

37. V. P. Semenov Tian'-Shanskii, ed., *Zapadnaia Sibir'*, vol. 16 of *Rossiia: Polnoe geograficheskoe opisanie nashego otechestva* (St. Petersburg, 1907), p. 284.

38. Goriushkin, *Sibirskoe krest'ianstvo*, p. 157.

39. Samuel Turner, *Siberia: A Record of Travel, Climbing, and Exploration* (London, 1905), p. 39.

At the end of the nineteenth century, after years of relative isolation, Siberia was linked to the outside world by the Trans-Siberian Railroad. At last a reasonably swift means existed to ship the long-awaited and much-needed foreign capital and equipment necessary for the acceleration of Siberian economic growth. Most important to the development of the butter industry were the separator and a primitive form of refrigeration. Without the separator, real butter never could have been produced in Siberia. Without ice wagons in summer, the produce would have spoiled in transit, for the trip from Western Siberia to the Baltic required between ten and twenty-one days.[40] Indeed, had the railroad been constructed in 1880, when Danish capital and technology were already available, the butter industry might have begun its rapid rise twenty years earlier.

Seven to eight times more transportable than wheat, butter was one of the few food products produced in Western Siberia capable of profitably surviving the long rail journey to the Baltic ports. A pood of butter manufactured near Novonikolaevsk (Novosibirsk) sold for 15 rubles in London, to which it had been conveyed for roughly 3 rubles.[41] Thus, transport costs averaged 20 percent of the total price received in contrast to 50 to 75 percent figures for wheat.

The available data indicate that the relationship of the Western Siberian butter industry to the Cheliabinsk Tariff was by no means a simple case of substitution. There may very well have been a shift from the export of grain to that of butter in response to the freight barrier, as Ullman's hypothesis predicts, but this cause cannot be distinguished unambiguously from other factors operating in the same direction. The impact of the tariff is hopelessly obscured by a multitude of variables which operated during the turbulent years between 1896 and 1913. It must be concluded that factors other than the tariff were equally, if not more, important to the development of this industry.

Although the manufacture of butter in Western Siberia has persisted under Soviet rule (table 2), "Siberian Butter," as it was named commercially, is no longer available in the West. It may have been imported into the United States as late as 1930, being marketed along with Danish butter as a specialty grocery item. Yearbooks compiled in the late 1920s by Santalov and Segal display AMTORG advertisements of, among other things, "Si-

40. This system of "refrigeration" was nothing more than a series of specially insulated rail cars, painted white ostensibly to reflect the sun and packed with ice gathered from the rivers after the spring thaw. The ice was maintained in storehouses spaced periodically along the trunk line for refill purposes. Ibid., p. 51.

41. Goriushkin, *Sibirskoe krest'ianstvo,* p. 163.

Table 2. *Western Siberian Butter Output Since 1917 Compared with 1913 Statistics*

Year	Total Output (Poods, millions)	Exports Abroad (Poods, millions)	Number of Cows (Millions)	Remarks
1913	5.0[a]	4.5[a]	3.0[b]	70 percent of Russian butter output[c]
1927	2.5[d]	1.5[e]	2.9[d]	—
1933	2.2[f]	1.7[e]	—	—
1940	2.7[g]	—[h]	2.2[g]	1/5 of USSR production; led the nation[i]
1945	1.4[i]	—	—	—
1950	2.8[j]	—	2.1[j]	Led USSR in butter output[fi]
1958	4.2[g]	—	2.6[g]	Led USSR in butter output[i]
1960	4.8[g]	—	2.8[g]	—
1964	5.2[g]	—	3.1[g]	4th in USSR in butter output[c]

[a] Estimated from Siberian figures of over 6 million.
[b] A. M. Voznesenskii et al., eds., *Atlas razvitiia khoziaistva i kul'tury SSSR* (Moscow, 1967), p. 137.
[c] V. V. Kistanov, A. B. Margolin, and L. V. Starodubskii, eds., *Zapadno-Sibirskii ekonomicheskii raion* (Moscow, 1967), p. 151.
[d] Estimated from figures given in Vserossiiskii Soiuz Molochnoi Kooperatsii ("Maslotsentr"), Introduction, *Itogi deiatel'nosti maslotsentra za 1927 god* (1928), pp. 4, 6, 8.
[e] Estimated from Ministerstvo Vneshnei Torgovli SSSR, *Vneshniaia torgovlia SSSR: Statisticheskii sbornik 1918–1966* (Moscow, 1967), p. 22.
[f] Estimated from Vsesoiuznyi Kartograficheskii Trest (Redaktsionnyi Sovet NKTP SSSR po kartografirovaniiu promyshlennosti), *Atlas promyshlennosti SSSR na nachalo 2-oi piatiletki* (Leningrad, 1934), map 54.
[g] *Narodnoe khoziaistvo RSFSR v 1965 g.: Statisticheskii ezhegodnik* (Moscow, 1966), pp. 162 and 284.
[h] Exports apparently ceased in 1937. W. M. Hamilton, *The Dairy Industry in New Zealand* (Wellington, 1944), p. 165. Some 1.2 million poods of butter were exported from the USSR (1.1 million, estimate, Siberian) annually in 1935–37, while the source in note e above depicts a total of only 17 poods for 1938 as the export for the entire nation.
[i] I. Komogortsev, *Sibir' industrial'naia* (Novosibirsk, 1968), pp. 157, 159, 162.
[j] *Narodnoe khoziaistvo RSFSR v 1958 g.: Statisticheskii ezhegodnik* (Moscow, 1959), pp. 176 and 263.

berian Butter."[42] While foreign export of the commodity ceased in 1937 when the supply faded during collectivization, shipments of Siberian butter to Central Asia and the Soviet Far East are still very important to the domestic economy. In fact, Western Siberia led the nation in butter production until the early 1960s. Nevertheless, the record output of 1913 was not exceeded until around 1964. By that time, however, Western Siberia ranked only fourth among the butter-making regions of the USSR.

42. A. A. Santalov and Louis Segal, *Soviet Union Year Book 1929* (London, 1930), page unnumbered, fifth advertisement from the front cover.