ISSN 1883-1656

Центр Российских Исследований

RRC Working Paper Series No. 67

Russian Agricultural Statistics

Manabu SUHARA

March 2017

RUSSIAN RESEARCH CENTER
THE INSTITUTE OF ECONOMIC RESEARCH
HITOTSUBASHI UNIVERSITY
Kunitachi, Tokyo, JAPAN

Russian Agricultural Statisitics

Manabu Suhara

Nihon University

Introduction

This paper will discuss Russian agricultural statistics. Section 1 below introduces an overview of agricultural statistics in Imperial Russia, and presents the results of calculations of agricultural production indices from this data. Sections 2 and 3 address agricultural statistics for the Russian Republic (RSFSR) during the Soviet era: Section 2 briefly reflects on Soviet agriculture, and considers the significance of agriculture in the economy of the Soviet Union. This is in order to deepen understanding of the agricultural statistics of the Russian Republic to be introduced in Section 3. Section 3 shows the main agricultural statistics released by the Russian Republic statistical authorities in organized formats, and indicates related issues. Specifically, the first part of Section 3 presents statistics related to agricultural production in the Russian Republic, and the second part provides the problems with Soviet Union (Russian Republic) official statistics as indicated by scholars particularly in the West. The third part addresses statistics related to the main forms of agricultural operations in the Soviet Union, such as kolkhozy and sovkhozy, and the fourth part summarizes statistics related to labor in agriculture in the Russian Republic. Section 4 presents an outline of the changes in Russian agriculture and agricultural statistics since the collapse of the Soviet Union.

1 Agricultural statistics in Imperial Russia

The trigger for the establishment of official agricultural statistics in Imperial Russia was the serf Emancipation decree, which was in turn enacted in 1861 (Kikuchi 1964, p.97). Specifically, the formation of the “Central Statistical Committee” under the Ministry of Internal Affairs was decided in 1858 in preparation for the Emancipation; following this central committee, regional statistical committees controlled by the governor of each Province were subsequently established not only throughout European Russia but also throughout the various Provinces of Siberia. The activities of the Central Statistical Committee in this period were far from adequate, however, consisting mostly

of reviewing existing materials. In practical terms, it is considered to be from the 1870s that the Committee began proper operations; it was even later, from 1888, that statistics relating to agriculture came to be released on a regular basis. Specifically, in 1888 the Central Statistical Committee published "Average Harvest Yields in European Russia, 1883-1887" (Srednii urozhai v evropeiskoi Rossii: za piatiletie 1883-1887 gg.) as a volume of their bulletin, *Imperial Russia Statistics*, Vol. 4, releasing data such as grain and potato yield quantities, and area sown with seed, in a retrospective manner. From 1888 onwards, the Committee continued to release agricultural statistics for each year in largely the same format as the 1888 edition. Statistical tables 1.1 and 1.2 at the end of the paper show the yield quantities (gross output quantities) and sown area figures, respectively, from these annual collections of statistics. Note that the Central Statistical Committee would also sporadically release statistics such as yield quantities before 1888, and that works by Soviet researchers (Khromov; Nifontov) display data which may be judged as in the same vein as official statistics. In particular, Statistical table 1.1 is a collection of data taken also from such supplementary sources.

There are several notes to be made regarding Statistical table 1.1. First: it is thought that these official statistics often underestimate the actual quantities harvested. The British economist Malcom Falkus considered it best to think of statistics on grain in particular as "rough estimates" rather than the results of exact calculations (Falkus 1968, p.56). Falkus estimated the national income for Imperial Russia in 1913 by himself and found it to be 10% higher than the income figures obtained from agricultural production. Nonetheless, since there are no materials which we can use other than official statistics, we have no choice but to rely on this data even if there is a degree of inaccuracy.

Second: "grains" in official statistics indicates the 9 types of produce for which yield quantities are shown in the table: wheat, rye, barley, oats, emmer, buckwheat, corn, peas, and millet. Yet the definition of "grains" in official statistics was changed in 1904. Specifically, oats were excluded from the existing definition, and replaced with the addition of lentils and grain beans,[1] resulting in the term "grains" indicating 10 types of produce. In the "grains" column of Statistical table 1.1,

[1] This is the translation used here of the Russian "boby." Considering Soviet-era statistics, the term likely refers to produce such as green beans and broad beans. Peas and lentils, though separately mentioned, are also grains—but in this case the term refers to types of grain-beans that are neither peas nor lentils.

however, the old definition is used unrevised, and the yield quantities for "grains" under the new definition are shown in the "grains (new definition)" column. According to the Ministry of Internal Affairs Central Statistical Committee, oats were excluded because they were produced mostly for use as feed, not for foodstuffs (*Imperial Russia Statistics*, Vol. 59, (Ozimyi urozhai 1904 goda), p. I).

Third: up until 1894, Russian official statistics show agricultural produce yield quantities in "chetvert'," a unit of volume. At the time, it was not only Russia which measured grain yields in volume units; in the United Kingdom, for instance, wheat yields were measured in bushels (1 bushel = 36.37 liters). The "*koku*（石）" and "*to*（斗）" used in Japan for measuring rice are also volume units. From 1895, agricultural produce yield quantities in Russian official statistics changed to be displayed in "pud" (1 pud = 16.38kg). Since yield quantities in both chetvert' and in pud can be obtained from official statistics for the 4 years from 1890 through 1893, in this paper conversion rates have been calculated from the averages over these 4 years for each type of produce, and all chetvert' figures have been converted into pud.[2] In Statistical table 1.1, yield quantities are further changed into tons.

Lastly: as time passed, the areas of Imperial Russia covered by official agricultural production statistics was gradually expanded. Chart (1) of Statistical table 1.1 is of the 50 Provinces of European Russia within Imperial Russian territory; chart (2) is of 72 Provinces of Imperial Russia; chart (3) is of 90 Provinces of Imperial Russia. Roughly speaking, the 50 Provinces of European Russia equate to an area which includes the present-day European portion of Russia, Ukraine, the three Baltic states, Bessarabia (now Moldova), and part of Belarus. The 72 Provinces of Imperial Russia equate to an area which includes 10 Provinces of Poland (Vistula), 3 regions of southern Russia such as Kuban, the South Caucasus Province of Chernomorsk, 4 Provinces of Siberia such as Tobol'sk, and 4 Provinces of central Asia such as Semipalatinsk, in addition to the 50 Provinces of European Russia. The 90 Provinces of Imperial Russia signify virtually the entire territory of Imperial Russia (excluding Finland), including the South Caucasus, Eastern Siberia, the Russian Far East, and Central Asia, in addition to the 72 Provinces of Imperial Russia.

The following trends can be observed in crop yield quantities from Statistical table 1.1. First, as a

[2] The conversion rates are as follows. Wheat, 1 chetvert' (same below) = 9.40 pud; rye, 8.72 pud; oats, 5.65 pud; barley, 7.83 pud; emmer, 6.57 pud; buckwheat, 6.69 pud; corn, 9.58 pud; peas, 9.77 pud; millet, 9.44 pud; potatoes, 9.25 pud.

whole, there is a clear trend of increase in yield quantities. Comparison of the 1871-1875 and 1909-1913 averages for individual main crops also indicates increases by 3.2 times for wheat, 1.5 times for rye, 1.9 for oats, 3.8 for barley, and 4.1 for potatoes (used also as an ingredient in vodka production). Considered in combination with figures for area sown from Statistical table 1.2, an increase in land productivity per unit of area sown is also noticeable: growth of production per 1 hectare is estimated at 2.08 times for wheat from 1872 to the 1909-1913 average, and 1.65 times for rye during the same period. These trends are a result of certain advancements in agricultural methods, tools, and animals used for labor.

As detailed above, amongst the four main crops the increases in wheat and barley production are particularly noticeable. This fact is related to Russia's exports. Specifically, from the 1880s onwards the quantities of wheat and barley exported increased rapidly; approximately 30-40% of quantities produced would be exported, compared with less than 10% of rye and oats. From the start of the 20th century, wheat and barley became top and second-top export goods, respectively. The export of Russian grain immediately brings to mind the "starvation exports." This term was coined from Finance Minister (1887-1892) Ivan Vyshnegradsky's slogan "We ourselves shall not eat, but we shall export," but Shoichi Tomioka claims that conditions fitting the term "starvation exports" were not necessarily present at any and all points in time, adding Paul Gregory's assertion that grain consumption per person in Russia at the time was increasing (Tomioka 1998, pp. 28, 128).

One characteristic of the state of agricultural production per region is increase in production outside of European Russia. This may be easily calculated from Statistical table 1.1: whilst the 1900-1913 increase in grain production is 1.44 times for the 50 Provinces of European Russia, there is a 1.55-times increase for the 72 Provinces. The 1909-1913 increase is 1.10 times for the 50 Euro-Russia Provinces, but 1.15 times for the 72 Provinces, and 1.14 times for the 90 Provinces. The increase in wheat production in the outskirts of Imperial Russia is particularly remarkable: whilst 22 Provinces in the outskirts of Imperial Russia have a 24.5% share of wheat production in 1900, this share increases to 31.5% in 1913; the 30.6% share held by 40 outskirts Provinces in 1909 increases to 36.1% in 1913.

However insufficient the strictness of methodology may be, let us attempt to estimate gross and net Russian crop-farming production indices for 1860-1913 using data from Statistical table 1.1 and borrowing the methods of Falkus (1968) mentioned previously (the original is thought to be the Prokopovich's method (S. N. Prokopovich, Opyt ischisleniia narodnogo dokhoda 50 gubernii

Evropeiskoi Russii, Moscow, 1918)).[3] We will firstly calculate a gross production index. The prices of agricultural produce for 1913 are used as the prices necessary for constructing the index (see Chart 1.1). Prices for the four main crops may be obtained for each year between 1881-1913 with Liashchenko (1915, p.123), but the Falkus data used here was the only source found to offer values for grains including potatoes. Thus, in spite of the disadvantage of this data being for 1913, the final year in the estimation period, prices for this year have been chosen for use. A gross output index may be obtained by multiplying these prices by the crop yield quantities for each year—as shown in Statistical table 1.1, however, there are some years for which individual yield quantities cannot be obtained. For these years, values acquired by simply indexing yield quantities for all grains are chosen for use as the production index. Additionally, production quantities for produce other than the individual items shown in Statistical table 1.1, such as hemp, flax, tobacco, (sugar) beet, and sunflowers, are presumed to have fluctuated to the same ratios as the representative produce. The index thus created for the 50 Provinces of European Russia is shown as the crop-farming sector gross production index in Chart 1.2 (Note that the index for 1864 is 100 for reasons detailed below.)

[INSERT CHART 1.1]

[INSERT CHART 1.2]

Next we will calculate the net production index. Net production here indicates the total quantity produced, i.e. the gross yield quantity, minus the portions used for seeding or for feed. Falkus's method is also used here, as mentioned above. Falkus calculates the ratio of net to gross production for each individual product (using averages from 1909-1913), from Prokopovich's estimated data (see Chart 1.1). We will also use that ratio, supposing that the ratio is constant over time, and calculate yearly net production figures for each product. Note that the gross production index for all grains is used for the years for which individual product yield quantities could not be obtained. The figures from these calculations form the crop-farming sector net production index shown in Chart 1.2. As expected from the net output rates shown in Chart 1.1, which indicate no great difference between each product, growth of net crop-farming output is not greatly different from that of gross

[3] The aim of Falkus's paper was to estimate Russian national income in 1913, not to estimate production indices.

output.

Let us next turn to livestock production. Statistical table 1.3 presents the numbers of livestock animals, which were measured each winter. It is thought that this was continued into the Soviet era and came to be the statistics detailing numbers of livestock animals at the beginning of January each year (see Statistical table 3.5). The numbers shown in Statistical table 1.3 are figures for the 50 Provinces of European Russia. We will create a net output index for livestock in the same manner as for the crop-farming sector. The Soviet economic statistician Vainshtein (1969, p.62) introduces Prokopovich's estimates for Russian national income, which were also cited in Falkus; Vainshtein states that Prokopovich estimated 4 types of livestock production income (value-added) in European Russia in 1900 and in 1913 as follows: horses, 10.8 million rubles (1900) and 20.9 million rubles (1913); beef and dairy, 610.0 million rubles and 1,167.3 million rubles; pigs, 94.0 million rubles and 284.1 million rubles; sheep, 116.7 million rubles and 257.4 million rubles. (Note that whilst it is thought that the majority of horses kept at the time were livestock, Vainshtein annotates horse livestock income as "sales of horses and leather.") Between these Prokopovich income estimates and the livestock counts shown in Statistical table 1.3 it should be possible to expect a linear relation similar to, for instance, the capital coefficient which often appears in economic literature. Specifically, value-added output figures would also increase in proportion to livestock count. Annual livestock national income may be obtained through multiplying the income per head of 4 types of livestock (i.e. the income-livestock coefficient) by the annual livestock counts for each ("cattle" in Statistical table 1.3 also includes oxen used for labor; since statistics on cattle used as livestock are not available, however, this fact will be ignored). The index made from this should be the livestock net output (value-added output) index. In fact, largely the same index is obtained regardless of whether the calculation uses an income-livestock coefficient from 1913 income or from 1900 income. Chart 1.2 displays the livestock sector index using a 1913 income-livestock coefficient.

Finally, this section attempts calculation of a net agricultural output index for the 50 Provinces of European Russia in Imperial Russia by combining the net crop-farming output and net livestock output indices shown in Chart 1.2. One issue is the weight for the two indices when constructing weighted averages; for this, let us use the revised versions of the Prokopovich estimates found in Falkus. Falkus estimates the gross national income for the 50 Provinces of European Russia in 1913 (including depreciation) as 13,723.5 million rubles, 6,540.4 million rubles of which (47.7%) being agricultural sector income. The details of this agricultural sector income are: 4,313.0 million rubles

for crop farming; 1,729.7 million rubles for livestock; 497.7 million rubles for other types of agriculture (e.g. hay, straw, grapes, horticulture, beekeeping) (Falkus 1968, pp. 65, 67). The ratio of crop-farming income to livestock sector income, ignoring the other types of agriculture, will be used as the weight when averaging the two output indices. The specific process is as follows: first, revise the crop-farming sector and livestock sector indices taking e.g. the 1913 index value as 100, then calculate the geometric mean for this using a weight of 43.130:17.297. The result is an index for the entire agricultural sector. For years which do not have livestock sector index values, the crop-farming sector index values alone are used as the values for that year. In other words, the crop-farming sector index is used to create two indices (one before, one after) from the combined index values for the previous year and for the following year, and the geometric averages of these indices become the combined index for the year in question. The combined index in Chart 1.2 is the net agricultural output index for Imperial Russia (50 Provinces of European Russia) calculated in this manner; Figure 1.1 is a graph of the crop-farming, livestock, and combined indices.

[INSERT FIGURE 1.1]

2 Soviet Russia and agriculture

The present and the following sections will discuss agriculture in the Soviet-era Russian Republic (RSFSR). As detailed above, agriculture was the most important production sector in Imperial Russia, even in 1913 after a certain degree of industrialization had taken place, accounting for about half of national income. In the Soviet era, too, agriculture continued to be an industry of significance for the economy as a whole. Let us trace the significance of agriculture in each period of the Soviet Union, referring to agricultural output indices from official statistics.[4] Agricultural production indices for the Russian Republic will be shown later, but since agricultural production indices for the Russian Republic during the Stalin era unfortunately do not appear to have been released, they will be substituted by production indices for the whole Soviet Union. This data is presented in Statistical

[4] In particular, Miyanabe (1967), Nakayama (1976; 1981), Sato (1975) and Shigemitsu (1979) ere referenced for the accounts which follow in this section..

table 2.1, and in Figure 2.1. According to the 1897 census, around 75% of the population of Imperial Russia was involved in agriculture; as such figures show, Russia was an striking agricultural nation. The joint Bolshevik-SR government borne from the 1917 revolution may fundamentally be considered the power of urban laborers, yet the leadership did show a position of closely following the interests of peasants by announcing the "Decree on Land" and choosing to "abolish entirely systems of private land holding, and grant to all citizens equal right to use and to benefit from land." However, due to the devastation of land following the subsequent civil war, and the forced requisition of agricultural goods by the Bolshevik government, the nation's agriculture itself neared a crisis of collapse. As shown in Figure 2.1 (Statistical table 2.1), 1921 was a year of great famine in which agricultural output was 60% of 1913 figures; from the particularly high rate of decline in the crop-farming sector, too, it can be said that over 40% of necessary key foodstuffs were lacking.

[INSERT FIGURE 2.1]

Vladimir Lenin, sensing that previous policies had reached a deadlock amidst these conditions, announced a decree on foodstuffs taxation in March 1921 and allowed peasants to deal with harvested goods freely after paying tax; he also established the Russian Republic Land Code in October 1922, guaranteeing peasants the right to use and to benefit from land. Thus, the legal and structural frameworks of the NEP system were established. Namely, peasants acquired the rights to stable use of land and to complete control over harvested goods, as they had previously hoped. The effect of these measures were enormous, and as can be seen in the Statistical table 2.1 and Figure 2.1, the agricultural output for 1928, when the economic performance of the NEP system reached its peak, surpassed 1913 by 24% and was over double that of 1921. Yet for the government, grain procurement in particular fell short of expectations. Increased procurement was necessary to fulfill demand from growing urban populations, but peasants were dissatisfied with low procurement prices and were reluctant to sell to the government. Peasants began selling to private merchants, or hoarding harvested grain. Procurement issues worried the government throughout the 1920s, and from 1927 to the beginning of 1928 in particular there were conditions referred to as the "Grain Procurement Crisis." At the 15th Party Congress (called the "Collectivization Congress") in December 1927, Stalin, who had already come into power, asserted the limits of small-scale peasant management based on the NEP system, and worked out a policy of collectivizing individual farming.

Industrialization, accompanying collectivization, was strongly pushed ahead according to the first five-year plan begun from October 1928.

Marx and Engels thought that socialist revolution would spread in turn from developed nations to developing nations; they therefore did not need to advocate industrialization. In other words, they saw it as adequate post-revolution to simply manage the economy in a planned manner, without any intentional design of industrialization. Yet for Russia's revolutionaries, who recognized their own country as a developing nation surrounded by strong, capitalist, developed nations, it was necessary to achieve rapid industrialization at all costs. Lenin had already created GOELRO (a 10-15-year plan for electrification of Russia) in 1920, and in 1921 he established the State Planning Committee (Gosplan) and prepared to create plans for single years. Generally, for the industrialization of developing nations it is unavoidable for any kind of state to take out funds from the agricultural sector and invest them in the industrial sector. Perhaps it was inevitable that Stalin, who felt a sense of crisis regarding the international environment of the Soviet Union, began collectivization in an attempt to bring the agricultural sector under his own control. Or perhaps it could be said that it was inevitable that the Russian government, which was fundamentally an urban power, sought to put the agricultural community as a whole under its own management. Yet Stalin carried this out in the most violent manner imaginable. Peasants put up resistance to forced collectivization by slaughtering large numbers of livestock, which is shown in the halved output in the livestock sector in 1928-1933 in Statistical table 2.1.[5] As can also be seen in the same Table, it was in 1953 that livestock farming output returned to the pre-collectivization levels of 1928. Note however that this lateness of livestock revival was also largely influenced by the serious damage which followed the second World War.

This substantially hostile view of peasants by the Communist Party government began to ease after Stalin's death in 1953, when Khrushchev came into power. In order to make clear the change from the Stalin era, Khrushchev enacted multiple reforms even only relating to agriculture. The first which should be mentioned is the "Virgin Lands Campaign," which was implemented from 1954 through 1956. According to official statistics, the total area sown for agriculture in the Soviet Union in 1953 was 157 million hectares, and in the period from then until Khrushchev's fall from power in

[5] Meanwhile, against expectations no serious drop may be seen in crop farming. The negative image we have of collectivization may stem mainly from livestock farming.

1964 this area increased by 55 million hectares. Over half of the added area was northern Kazakhstan, but considerable increases in sown land may also be seen in the Russian Republic (see Statistical table 3.4), such as in the Ural, Western Siberia, and Volga regions. Nearly half of the land added in the Khrushchev era was planted with corn, for use as feed. This was aimed to increase the supply of livestock products, which saw explosive increases in demand at the time. The area sown and yield quantities for grains in particular certainly increased following this "Virgin Lands Campaign," but at the same time agricultural production was also presented with a great problem.

Originally most of the agricultural land in the Soviet Union was situated towards the north, at latitude 45-55 degrees north. One decisive difference from Canada and Northern Europe, which are at the same latitude, is the low level of average rainfall. Generally, if annual rainfall is 500-1,000 millimeters, it is possible to farm without irrigation. The cultivated land in Canada and Northern Europe fulfills this condition, but the normal rainfall for cultivated land in the Soviet Union is 200-600 milliliters. In other words, as a natural condition the Soviet Union is a limited zone for agriculture, meaning that there are great fluctuations between good and bad harvests. Yet the new cultivated land from Khrushchev's "Virgin Lands Campaign" were generally in regions which had even less rain than existing cultivated land. Output certainly increased with the "Virgin Lands Campaign," but farming in the Soviet Union took on even greater yearly fluctuations than before. This will be discussed again in a later paragraph on grain imports by the Soviet Union.

Khrushchev's second agricultural reform was a policy of increasing sovkhozy. Soviet-era agriculture, subsequently to the collectivization, was conducted by sovkhozy (sovetskoe khoziastvo; state-run farms) and kolkhozy (kollektivnoe khoziaistvo; collective farms). A sovkhoz was a "large-scale, state-run, highly-mechanized socialist agricultural enterprise," and "all of the means of production and produce of the sovkhoz are property of the state." In other words, a sovkhoz was a state-run enterprise, the same as an industrial enterprise. Before World War II sovkhozy represented a small proportion of agricultural output, and operated more as model farms for showing the superiority of mechanized socialist agriculture; in 1940 they were also limited in number, at little over 4,000 across the entirety of the Soviet Union. Meanwhile kolkhozy were—at least in theory—"cooperative organizations of peasants who have voluntarily gathered together in order to undertake large-scale, socialist agricultural production together on the basis of social production means and collective labor," and "large-scale agricultural enterprises which undertake social management, within the framework of a planned economy, of land which has been approved by the state for free

and unrestricted use" (Nazarov *et al*., 1981, p.105; 117). In practice, most collectivized peasants were organized into kolkhozy, and in 1940 the number of kolkhozy was a little over 237,000 throughout the Soviet Union. Kolkhoz units were largely formed from traditional villages and cultivated crops by collectively owning land, livestock, tools and so forth. Generally, kolkhozy are considered to be lagging as operations compared with sovkhozy, and in practice the incomes of kolkhozniki (kolkhoz members) were lower than sovkhoz workers. Khrushchev not only established most of the agricultural land newly created in the Virgin Lands Campaign mentioned above as sovkhozy, but also merged several kolkhozy and reformed them into sovkhozy, for the purposes of economies of scale. This did substantially increase peasant income, and indeed kolkhoz member income also increased as a result (see Statistical table 3.10).

Khrushchev's third reform was an increase in state purchase prices of agricultural goods. It is said that in the first half of Khrushchev's term purchase prices were raised to three times those before, but nonetheless for livestock goods this was lower than cost price. In addition, he also unified the purchase price system which previously had separate kolkhoz and sovkhoz prices. Aside from these policies, Khrushchev also enacted other reforms such as the 1958 dissolution of the MTS (Machine and Tractor Station), which had until then become a pillar of farmer control by state power. MTS was essentially an organization which became a channel for collecting agricultural produce by the state, as well as offering kolkhozy services using machinery such as tractors and combine harvesters; Khrushchev's measures transferred the machinery and machinists (e.g. engineers, drivers) previously held by MTS to neighboring kolkhozy and sovkhozy.

Khrushchev's agricultural reforms can be considered part of a policy of harmony with peasants, generally converting Stalin's policy of hostility towards peasants; it may also be said that they finally enabled the benefits of Stalin-era industrialization to be felt by peasants. Alternatively they could be seen as a movement to bring agriculture and peasants under state (Communist Party) control. This Khrushchev agricultural policy was continued from the following Brezhnev era and also came to be strengthened in some parts. For instance, as shown in Statistical table 3.10, wages for kolkhoz workers continued to near those of sovkhoz workers from the Brezhnev era until the collapse of the Soviet Union. Also, the number of sovkhoz workers came to completely overtake the number of kovkhoz workers in the 1980s (see Statistical table 3.8). Additionally, state purchase prices were further raised in the Brezhnev era. These agricultural reforms beginning in the Khrushchev era can, on the one hand, be seen as linked to increases in agricultural output,

consequent advancements in the livelihoods of citizens, and improvements in treatment of peasants. The average annual rate of output increase in total Soviet Union agricultural production per five-year plan period may be calculated from the output indices shown in Statistical Table 2.1 (using indices from the first and final years of the five-year plans). This rate is, in order from the fourth five-year plan (1946-1950): 8.1%, 5.5%, 3.0%, 1.8%, 2.4%, 0.3%, 0.3%, 2.3%, and -0.1%; except for the final twelfth five-year plan (1986-1990), the figures are positive. On the other hand, however, the reforms also brought new problems which did not previously exist. What follows is a simple account of the issues of grain imports, and of responsibility for finances following policies to improve conditions in agricultural communities, which became clear in the 1970s. Regarding the latter: an increase in sovkhozy, which were more expensive for the state than kolkhozy (e.g. sovkhoz workers had to be paid higher wages than kolkhozniki), would inevitably incur a burden on state finances; what caused particular concern was the "negative margin" of consumer prices of agricultural goods caused by increases in state purchasing prices. In 1973 this amount had already reached 19.3 billion rubles, which was equivalent to national defense spending (official) (Sato 1975, p. 77, 169). Considering that annual state expenditure for the same year was 184.0 billion rubles, and that the produced national income was 337.2 billion rubles, this figure is an astounding amount. Further, in 1976 the figure reached 19.0 billion through meat and milk price subsidies alone (Sato 1979, p.211). It could be considered that these agricultural subsidies reduced investment in other sectors, subsequently hindering economic growth in the Soviet Union.

Let us turn next to grain imports. Imperial Russia was originally a huge grain-exporting nation. In 1913, for instance, 9,087 thousand tons of grain were exported, which was 10.6% of the 86 million tons of grain produced in that year (Nakayama 1981, p.146). Of course, there is the "starvation exports" side to this exportation, whereby even in famine years citizens were left starving and exports made in order to further industrialization. After the subsequent revolution, the Soviet Union continued grain exports, although they did not reach the levels of the Imperial era. Particularly from when eastern Europe was placed under the sphere of Soviet power following World War II, around 3-6 million tons of grain were exported annually to eastern European countries. It was 1964, the year following the poor harvest of 1963, in which the Soviet Union suddenly imported 7.3 million tons of grain. In fact, in 1964 the Soviet Union registered losses in grain trade for the first time. Later, there were large intermittent imports of grain in 1972 and 1973; there was an extremely poor harvest in 1975, necessitating imports of 15.91 million tons that year and 20.64 million tons in 1976. In order

to prevent disorder of the global grain market caused by sudden action by the Soviet Union, the US-Soviet Grain Agreement was signed in 1975, and the Soviet Union would thus import 6 million tons a year, regardless of harvest quantities. In 1984 the Soviet Union imported the largest amount of grain in history, at over 50 million tons; 8 billion dollars are said to have been required as payment. If it were not for oil exports, grain imports would have surely caused greater problems for the Soviet Union. Most of this imported grain became feed for animals, not food for humans. As previously mentioned, from the end of the 1940s demand for meat in the Soviet Union increased explosively (see Statistical table 3.6), and there was a shortage of livestock feed for fulfilling this demand. In other words, the rise in income standards and the increase in urbanization were direct causes of these grain shortages.

In the 1980s, the phrase "agriculture is the Achilles heel of the Soviet economy" came about from various issues such as those above—and it can be said that, ultimately, the Soviet Union dissolved still nursing this heel.

3 Russian Republic agricultural statistics

[1] Production statistics

This section gives an overview of Russian Republic agricultural statistics. Let us first look at the main statistics for agricultural production on the whole. Statistical table 3.1 shows gross agricultural output values collected from published documents such as the official statistics collection *Russian Republic Statistical Yearbook* and presents the data in a clear format. Gross agricultural output in Soviet Union (Russian Republic) official statistics is defined as the gross output values of crop-farming (zemledelie, rastenievodstvo) and livestock (zhivotnovodstvo) agriculture after monetary valuation using current (nominal) prices or comparative prices (sopostavimye tseny). Naturally, flour, grain ground in mortars and such (krupa), butter, and cheese, or processed meat, animal fats, fur and so forth are industrial products, not agricultural products. The "comparative prices" mentioned in the definition of gross agricultural output above means the prices in a base year when obtaining the real output values. According to the terminology explanations in the back of statistical yearbooks and such, comparative prices are the weighted average prices of commodity and non-

commodity portions of gross agricultural product, with the commodity portion—i.e. agricultural products which are sold outside of the agricultural sector—being evaluated using state purchase prices (gosudarstvennye zakupochnye tseny) when sold to the state by residents of agricultural communities or kolkhozy, state delivery prices (gosudarstvennye sdatochnye tseny) for sovkhoz product supplies, and market prices when sold on the kolkhoz market by residents or by a kolkhoz. For the non-commodity portion of products, for state-run sectors or kolkhozy, cost prices are used. Further, the non-commodity portion in inhabitants' economy—namely, product which is consumed by the producer or used for agricultural production—is evaluated using average commodity prices. According to statistical yearbook accounts, until 1950 gross agricultural output and the index thereof were determined using 1926/1927 prices. Later, 1951 prices were used from 1951 to 1956, 1956 prices from 1956 to 1958, 1958 prices from 1958 to 1965, 1965 prices from 1965 to 1975, 1973 prices from 1975 to 1985, and 1983 prices from 1986 onwards (*Russian Republic Statistical Yearbook* 1988 edition, p.655).[6]

Let us consider the extent to which the agricultural output of the Russian Republic accounts for the agricultural output of the entire Soviet Union. As shown in Statistical table 3.1, whilst the gross agricultural output value in 1913 for the Russian Republic was 18.4 billion rubles, the calculation for the entire Soviet Union (final Soviet territory) is 35.0 billion rubles (both 1973 prices); accordingly, Russia accounted for 52.6%. This proportion falls somewhat to 47.1% in 1940, but in 1960 it is 50.7% (both figures calculated using 1973 prices). Later, Russia's share drops somewhat to 45-47%

[6] Note that in the 1960-1965 editions of the Statistical Yearbook, the following statement is made about the first portion of the base year changeovers mentioned above: "determined using 1951 prices from 1940 to 1956" (e.g. *Russian Republic Statistical Yearbook* 1964 edition, p.547). This was revised in later editions into the manner featured in the main text. Meanwhile, for the entire Soviet Union, in the 1959-1963 editions of the *Soviet Statistical Yearbook* the gross agricultural output calculations are said to have used "1926/1927 prices until 1932, and 1951 prices from 1932 to 1956 […]" (e.g. *Soviet Statistical Yearbook* 1963 edition, p.697), whilst editions from 1964 onwards state that "1951 prices were used for determining 1940 until 1956"; later still, the method comes to be the same as that used for Russian Republic calculations as featured in the text. This sort of ambiguity in records can be considered one factor which kindles external distrust of Soviet official statistics. One wonders what manner of calculations methods were actually used.

and goes largely unchanged. Note that Russia accounted for 46.7% of agricultural output in 1990 (the final year for which data on the Soviet Union can be obtained), as calculated using 1983 prices.

Statistical table 3.2 displays a continuous sequence of gross agricultural output indices from the above base year index groupings obtained from the *Russian Republic Statistical Yearbook*. Specifically, the indices displayed here use 1973-price index values for 1913-1940, use 1965-price index values for 1940-1975, 1973-price index values for 1975-1985, and 1983-price index values for 1985-1990, and are proportionally calculated using the overlap years between each group and collated together as single indices.

As stated above, the Russian Republic share of agricultural output for the entire Soviet Union largely did not change after World War II; accordingly, it goes without saying that there is no great difference seen if the agricultural output growth rate is compared between the Russian Republic and the entire Soviet Union.

Compared with the figures for the entire Soviet Union seen in Section 2, the annual average rate of growth per five-year plan calculated from Statistical table 3.2 (using index numbers from the first and final years of the five-year plans, as in Section 2 of this paper) show no great disparity: the rate for the 5th five-year plan is 5.9% (5.5% for the entire Soviet Union, same below), 3.0% (3.0%) for the 6th, 1.2% (1.8%) for the 7th, 2.7% (2.4%) for the 8th, -0.1% (0.3%) for the 9th, 0.1% (0.3%) for the 10th, 2.9% (2.3%) for the 11th, 0.0% (-0.1%) for the 12th.

Statistical tables 3.3 and 3.4 are statistics on gross yields and areas sown for agricultural produce. Here, agricultural produce has been divided into rough categories—grains, industrial crops, potatoes and vegetables, produce used for feed, fruit, and so forth—and gross yields and areas sown for these categories have been displayed. First, Statistical table 3.3 is main crop gross yield (valovoi sbor). Statistics on gross yields of agricultural produce are probably the most important statistics in the crop-farming agriculture sector; in simplified terms, gross yields multiplied by the comparative price of each type of produce produces gross output value. Gross yield in Soviet Union (Russian Republic) official statistics is defined as "the size of the stored yield (ambarnyi urozhai; bunker weight) of a given crop actually harvested in the report year." For 1939-1953, in order to intentionally inflate yield quantities for grain and such, estimated yield before harvest—"biological yield" (biologicheskii urozhai, urozhai na korniu)—was used rather than bunker weight; later, however, these gross yields were also revised into bunker weight. Elements such as excess moisture are included in bunker weight, however, and at the end of the Soviet era measurements began to be

taken using weight after processing which removed these elements (ves posle dorabotki; termed "clean weight"); this is still the present approach. This is the "revised to clean weight" information in the third column from the left in Statistical table 3.3. According to statistical yearbook accounts, clean weight measures are 9-10% smaller than previous measures. The particulars of the changes in gross yield measurements will be discussed later. There were also two methods for corn in use in the Soviet Union (Russian Republic): namely, one method which counted only mature-stage corn, and another method which also counted milky-wax-stage (i.e. unripe, growth-stage) corn. It is said that the latter method, though, was abolished in 1955, and from then only the former method was used. However, at least until 1962, data including unripe corn was also released in the statistics. This is reflected in Statistical table 3.3.

As expressed above, from the end of the Soviet era yield statistics were revised to be shown in clean weight; meanwhile gross grain yield amounts in clean weight have since been reported in retrospective fashion. This is shown in the third column of Statistical table 3.3, but there is a somewhat peculiar occurrence here. As seen in the table, for all of the years from 1955 the grain yield amounts in clean weight are somewhat lower than the yield amounts in bunker weight, but before 1954 (excluding years for which the author has calculated bunker weight yield amounts, i.e. 1928, 1932, and 1937), measurements using both weight methods show the same values. It is unclear as to what sort of causes led to this occurrence, but the numbers released in official statistics have been featured here unchanged.

As with the areas sown detailed later, the sizes of gross agricultural produce yields for kolkhozy, sovkhozy, and other state-run operations have been calculated based on annual report data for the operations of these organizations. Meanwhile, gross agricultural produce yields for the private sector (personal subsidiary operations) of kolkhozniki, blue- and white-collar workers were to be calculated using data on the size of area sown for these operations, and data on average harvest yield per 1 hectare of land sown with a given crop, which were determined based on sample survey materials concerning household budgets of kolkhozniki.

Statistical table 3.4 shows statistics relating to area sown. In Soviet Union (Russian Republic) official statistics, area sown (posevnye ploshchadi) is based on spring production tables—namely, the area of crop seeding conducted up until the time when spring seeding has finished. As seen in Statistical table 3.4, total area sown indicates the sum of grains, industrial crops, potatoes/vegetables/gourds, and produce used for feed; it includes neither fallow land, nor land used

for fruits, berries, grapes, or tea. According to statistical yearbook accounts, the sizes of area sown for kolkhozy, sovkhozy, and other state-run agricultural enterprises are from data in report papers which were required to be submitted by these organizations. In addition, the sizes of area sown for private operations by kolkhozniki and workers (blue- and white-collar) from sovkhozy and other state-run enterprises are from sample surveys or comprehensive surveys. Concerning accuracy, however, statistics on area sown need to be handled with great care: someone responsible for land use and yields in the state statistics bureau themselves declared in a specialist journal, for instance, that "now and then some of the areas sown to this, that, or the other crop (cotton, flax, rice, and other crops) are concealed from the reports in order to raise the yields artificially" (Schinke 1972, p.242).

Statistical table 3.5 shows livestock animal numbers at the beginning of each year, and Statistical table 3.6 shows livestock output quantities. The definition for livestock sector output figures in the Soviet Union includes the sum of increases in weight resulting from fattening of livestock animals, and changes in inventory, i.e. increases in livestock raised within the year, in addition to sales of livestock animals and of animal produce (e.g. milk, eggs, wool). Statistical table 3.6 shows statistics for the weights for the latter two elements. According to an account in the *Russian Republic Statistical Yearbook*, the data for production of all types of meat by slaughter weight includes the secondary produce detailed later. The data also includes slaughter of livestock and poultry through industry or within farmhouses. The output weight of milk in the table includes all milk actually extracted, i.e. not only the volumes sold but also the milk used to raise calves, or for consumption within the farmhouses. Milk here includes not only cow milk, but also sheep milk, goat milk, horse milk, and so forth. Similarly, wool includes camel and goat wool. It should be noted that the changes in the amounts in hand of main livestock animals (cattle, pigs, sheep, goats, horses, reindeer, poultry) in Statistical table 3.5 are based on report papers which were submitted obligatorily by each organization for kolkhozy, sovkhozy, and other state-run enterprises, and from farmhouse patrol surveys by special survey committees organized by kolkhozy and such for the private sector. It is thought, however, that these survey methods were later simplified, as described below.

Note that the rate of output growth was generally more rapid for livestock produce than for crop-farming produce, as seen in Statistical table 3.2. The gross output values for the livestock sector, which were lower than gross output values for the crop-farming sector around 1950, increase to as much as nearly twice the crop-farming sector in 1990, as seen in Statistical table 3.1. As noted in Section 1, the ratio of crop-farming to livestock output in 1913 was about 7:3.

[2] Issues with production statistics

The previous section gave an overview of Russian Republic agricultural production statistics. These production statistics have been exposed to strong criticism from western researchers in particular. To summarize this criticism, one aspect is the small quantity of publicly-available statistics; one other aspect is doubt concerning accuracy. This section will discuss these two issues in detail.

First, the scarcity of statistics is surely clear from Statistical tables 3.1 and 3.2 above. Specifically, many of the statistics for before and a little after World War II—i.e., the Stalin era—are left blank in these Tables. This is a manifestation of the heightened secrecy around statistics furthered at the same time as the establishment of the Stalin regime, and the lacking thoroughness of anti-Stalin criticism in the post-Stalin era; the same phenomenon can also be observed across Soviet economic statistics (e.g. industrial statistics) as a whole. Yet the disorder accompanying the forced collectivization started in the late 1920s or early 1930s was so severe that its trends can clearly be seen particularly in agricultural statistics. As described below, in the Khrushchev era there were some constructive changes, but the remarkable tendency of Soviet leaders to use statistics as propaganda for the socialist system remained until the end. Accordingly, there are even now many blank parts in agricultural statistics for the 1930s and 1940s. At present we have no choice but to accept these circumstances, and must continue to endeavor to improve the situation for the future.

There are multiple aspects to the issue of scarcity in official production statistics, in addition to the difficulties above. For instance, there are especially few statistics on produce used for seeding or feed, or on produce losses, and this point has in particular caused dissatisfaction amongst western specialists. The Soviet Union (Russian Republic) considered gross output indicators to be of utmost importance, but what becomes problematic for citizens is not the simple output quantity, but rather how much of the product quantity can actually be consumed. In other words, the issue in the agricultural sector is not the gross output, but the size of net output, or value-added output. In order to know these figures, the quantity of output which is utilized in seeding or as feed, and of output which is lost before reaching the consumer, is an extremely important issue. Yet, accurate data concerning these details was very scarce. The end of this section will briefly explain a procedure

used by the United Stated Central Intelligence Agency (CIA) to estimate the value-added output of agriculture in the Soviet Union.

There are also issues with output of individual items. For instance, vegetable output statistics are only featured simply as "vegetables"; details of individual-item statistics were not released. Similarly there is also no individual-item output data for "fruits and berries." This data coarseness has also been subject to criticism from western specialists.

The second issue with Soviet Union (Russian Republic) statistics is statistical accuracy. With official industrial output indices, for instance, there was great overestimation in output increase. This sort of issue may exist for agriculture. Since we were able to acquire the 1965 comparative prices (Savitskii *et al*. 1974, pp. 462-464) which the statistics bureau used when calculating gross output (i.e. when constructing production indices), we conducted work to check this point. The results of this work are shown in Chart 3.1. Chart 3.1 compares the indices which we estimated in practice, against the official statistics output indices for the period during which the Russian Republic statistical bureau is believed to have been using 1965 base-year prices for calculating output indices, i.e. 1965-1975. The official gross output amounts using 1965 comparative prices from Statistical table 3.1 were entered unchanged into columns 1-3 of the table, and column 4 contains a production index calculated directly from column 3. Of course, this set certainly (if calculated proportionally) matches the 1965-1975 portion of the official output indices, featured in Statistical table 3.2, which take 1940 as 100. Columns 5-7 contain the gross output amount values estimated from multiplying our gross yield volume data by 1965 comparative prices. The 1965 gross agricultural output value in the official statistics is 34.9 billion rubles; in comparison, our estimate is 32.2 billion rubles. In other words, our estimate has 92.3% coverage for this year. Comparing the official indices with our estimated indices, the two indices do not display any great difference. Unlike industrial output indices, therefore, the agricultural output indices released by the statistics bureau may be considered as reliable. As shown in Suhara (2017), the main cause behind the upward bias in industrial production indices was the so-called "pseudo-new-products" issue; in agriculture, meanwhile, since new products or pseudo-new products almost never appear, perhaps it is no wonder that there is almost no divergence between the estimated indices and the official indices.

[INSERT CHART 3.1]

Generally, the main source of lacking accuracy in Soviet Union (Russian Republic) statistics can be said to have been ambiguity in definitions and in calculation methods. One example is grain output statistics in "biological" output weight. Officially, from 1939 (actually from 1933), biological yield quantities were introduced in official statistics. This is a system whereby yields predicted based on sample surveys prior to crop harvest are considered as official yields. Accordingly output quantities increased by about 20-40% from previous bunker weight measures. The adoption of this measurement method was probably undertaken for promotional effect to show the superiority of socialist production to the West. According to N. Jasny, who first became known for indicating this issue, when the method was first adopted the yield amounts would be announced before harvest with an estimated 10% loss at harvest; yet, at the end of the 1930s, the weight without taking this loss into account would be announced as the yield amount, and the biological measurement method came to be applied not only to grain but also to other crops (1947, pp.302-303). According to Russian researchers Rastiiannikov and Deriugina (2005, p. 161), the difference between grain yield volume per unit of area for the two methods are as shown in Chart 3.2 .

[INSERT CHART 3.2]

Biological yield volumes became symbolic of the Stalin regime, and immediately after Stalin himself died in 1954, it was decided to revise the volumes into the bunker weight system. It was 1958, however, in which this was officially confirmed and output volumes for the 1950s were released in bunker weight. In addition to the disorder which accompanied this change in yield estimation method, influenced by Khrushchev's agricultural policy, output volumes for the 1950s are often viewed with suspicion by the West.

According to the CIA (Central Intelligence Agency) in the United States, other examples of creating the impression of expanded output volumes through ambiguous definitions are the methods for verifying livestock animal numbers, and meat production statistics. Specifically, the definition of meat in Soviet Union statistics changes with the time period, and from the 1920s through to the 1940s it came to encompass gradually more types. Initially, meat was considered as beef and veal, pork, mutton and lamb, but it expanded to bird meat, rabbit meat, and fats of all sorts of animals. Also, before 1954 organs used for foodstuffs (entrails) were added, and in 1956 meat from horses, camels, and other animals came to be considered "meat." The example of livestock animal number

verification refers to the change in methods for verifying livestock animal numbers using an animal census in 1965. As mentioned before, previously a census committee member would visit kolkhozy and verify numbers in the first week of January each year. This census was abolished in 1965, however, and livestock animal numbers became somewhat simply verified based on monthly or quarterly reports submitted by kolkhozy to the statistics bureau. One result was an increase in statistical inaccuracies (JEC 1982, p.265).

This section lastly touches upon the method used to calculate value-added output indices for Soviet Union agriculture in 1950-1979 by the CIA (JEC 1982, pp.245-316). CIA estimates define net output and value-added output in agriculture in the following two ways, and calculate value-added output accordingly.

Net output = gross output - seeding - feed (including eggs used for hatching) - losses

Value added = net output - non-agricultural product input (e.g. fertilizer, fuel)

The CIA went to great troubles to calculate each one of these elements; let us consider losses as an example. Using the powers of the US Military, the CIA calculates rainfall from detailed weather data for every state (oblast') and region (krai) and, relating this to agricultural produce per region, estimates the size of agricultural produce losses for each area. In this manner the CIA uses vast amounts of energy to calculate the value-added production figures for Soviet Union agriculture; of interest to us here is the extent to which these figures match the changes in the gross output figures released by the Soviet government. Chart 3.3 shows that the CIA value-added output indices for 1950-1979 are as a whole 0.2% lower in annual average increase rate than the official gross output indices; they are lower than the official gross output indices in 1950-1960 and 1970-1979, and higher in 1960-1970. Taken as a whole, it may be said that there is not much of a difference between the value-added production increase rate and the gross production increase rate. Note that, for reference, official gross production indices for the Russian Republic have been included in the chart. Above is a somewhat detailed account of the calculation of value-added production for Soviet Union agriculture by the CIA. This sort of effort was necessary to learn the size of and changes in value-added output.

[INSERT CHART 3.3]

[3] Kolkhoz and sovkhoz statistics

As summarized in Section 1, the main forms of agricultural operations in the Soviet Union (Russian Republic) were kolkhozy and sovkhozy. Statistical table 3.7 contains statistics which show the fundamental trends in kolkhozy and sovkhozy. Let us add brief explanations about kolkhozy and sovkhozy as we consider each item in this table. The character of kolkhozy before World War II was very different to after the war. For instance, the number of kolkhozy in the Russian Republic in 1937 exceeded 170,000, whilst in 1980 it was a mere 12,000. From the Khrushchev era, as previously mentioned, kolkhoz mergers were undertaken with the aim of achieving economies of scale, and there were also kolkhozy being turned into sovkhozy. Calculated from Statistical table 3.7, the number of participating farmhouses per kolkhoz in 1937 averages at 64 households; for 1960, it is 341 households. Similarly the seeded area per kolkhoz is 468 hectares for 1937, and 3,486 hectares for 1960. From the fact that the increases in these figures from 1960 onwards are not so great (375 households and 4,633 hectares, respectively, in 1980), it is possible to understand the remarkable extent of kolkhoz scale expansion in the Khrushchev era. At the same time, as detailed below the average monthly wage for a kolkhoz member was 30 rubles in 1960 and 124 rubles in 1980. The income of farmers participating in kolkhozy is also thought to have increased (it is important, however, to note that in 1980 the average monthly wage for the entire Russian economy was 178 rubles and thus higher than for kolkhozy). Note that the "Kolkhoz gross income" also included in Statistical table 3.7 indicates net production of kolkhoz, i.e. having subtracted output expenditure (e.g. seeding, feed, fuel, depreciation) from gross output of Kolkhoz, (Nazarov *et al*.,1981, p. 93). In other words, this may be considered the amount contributed by kolkhozy to the produced national income.

Meanwhile sovkhozy differed from kolkhozy, which continued to drop in number from the 1930s: as shown in Statistical table 3.7, excluding a few exceptional years, their numbers were increased annually. The area sown per sovkhoz was already 3,070 hectares in 1940 and 10,393 hectares in 1960, i.e. 3 times the scale of kolkhozy. This period was the peak of sovkhoz scale expansion, however, and later the area was reduced year by year, with the average area sown in 1980 at 5,424 hectares. Nonetheless, agricultural policy-makers did not necessarily lose their gigantomania, and in the late Brezhnev era, sovkhozy, along with kolkhozy, came to form agricultural-industrial complexes which also subsumed food-processing industry enterprises. Note that the "gross income

of sovkhozy" in Statistical table 3.7, in the same manner as "gross income of kolkhozy," refers to sovkhoz contribution to produced national income. Also, "Numbers in basic production activities in sovkhozy" can be considered to indicate those amongst "total number of workers" who are engaged in basic production activities, i.e. agricultural labor.

Certainly, these two types of operations organizations—kolkhozy and sovkhozy—handled a large portion of agricultural production in the Soviet Union (Russian Republic), yet in practice, as seen in Chart 3.4, the role played by personal subsidiary operations, i.e. the quasi-private sector, must not be overlooked. "Personal subsidiary operations" refers to the agriculture undertaken by kolkhozniki, along with their families or with sovkhoz workers and their families, on garden plots belonging to their own households. In fact, Russian peasants had been cultivating potatoes, vegetables, fruit trees and such on their own household land since the Imperial era, in addition to cultivating the land allocated by communities. Further, whilst the land would be periodically reallocated within communities, there was no reallocation of this household land, which would be passed down from one head of the family to the next. It is thus thought that considerably more intensive agriculture was conducted with this land than with allocated land. This tradition survived through collectivization, and throughout the Soviet era peasants cultivated produce in the surrounds of their households. Additionally, in the latter half of the Soviet era, land in the outskirts of towns was also assigned to urban residents and came to be used for secondary agriculture. All of these factors count as personal subsidiary operations. As seen in Chart 3.4, whilst crops such as grains, sugar beets, and sunflowers were mostly produced by kolkhozy or sovkhozy, personal subsidiary operations were accountable for a notable proportion in particular of crops such as potatoes and vegetables, as well as livestock produce such as meat and dairy.

[INSERT CHART 3.4]

These agricultural products produced in the subsidiary economy would of course sometimes be consumed at home, but it was also possible to sell them at "kolkhoz markets." There was a "kolkhoz market" in every city in the Soviet Union (Russian Republic), and this was the only true market officially authorized by the socialist regime. Since high-quality goods would fetch high prices, sellers aimed to produce goods which would please buyers. This framework was also appreciated by buyers. Thus personal subsidiary operations, which had been perceived negatively in terms of

ideology until the Khrushchev era, instead came to be encouraged in the Brezhnev era. According to official statistics on sales of foodstuffs, in the 1970s around 10% of foodstuffs were purchased in kolkhoz markets. However, one great problem for personal subsidiary operations was the issue of feed. Specifically, there was almost no feed material on household land, and it is thought that feed often had to be borrowed from kolkhozy or sovkhozy out of necessity. In other words, personal subsidiary operations were not truly self-supporting operations; in some aspects, they were also parasitic and dependent on socialist organizations.

Moreover, in addition to kolkhozy, sovkhozy, and personal operations, agricultural production organizations called "intermediary operations enterprises and organizations (mezhkhoziaistvennye predpriiatiia i organizatsiia)" were encouraged from the Brezhnev era (relevant statistics were featured in the *Russian Republic Statistical Yearbook*, from 1974 edition). These were enterprises, financed and created by kolkhozy and sovkhozy, which engaged in agriculture-related work (particularly, construction); it is known, however, that increasing numbers of these enterprises would undertake agricultural production, particularly in the livestock sector.

[4] Labor statistics

This section finally discusses agricultural sector labor statistics. Let us consider how many people were engaged in agriculture in the Russian Republic. Almost no statistics were published on the size (worker numbers) of the agricultural sector labor force as a whole. This is because state-run sovkhozy and other state-run agricultural enterprises, and kolkhoz cooperative organizations, were statistically treated as separate entities, with their actual data also being featured separately in statistics. Specifically, workers employed in sovkhozy (and similar) were broadly categorized in the same manner as industrial sector workers—i.e. as "blue-collar (rabochie)" and "white-collar (sluzhashchie)"—and were shown statistically as agricultural sector blue-/white-collar workers. Namely, for sovkhoz workers the same names were used as for economic sectors other than agriculture. Meanwhile, kolkhoz workers were termed "kolkhozniki," in a manner removed from blue-/white-collar worker statistics. It is for such reasons that average annual blue-/white-collar workers and average annual kolkhozniki are displayed separately in Statistical table 3.8, which shows the labor force in the agricultural sector in Russia. Therefore, roughly speaking, adding

kolkhoz member numbers to entire national economy blue-/white-collar worker numbers provides workers for the entire economy, and adding kolkhozniki to agricultural sector blue-/white-collar worker numbers provides approximate workers for the agricultural sector.[7] In official Russian Republic statistics, several differing figures have been released for the same year's average annual blue-/white-collar worker numbers. Many of these are thought to be revisions of figures following changes to economic sector classifications. Statistical table 3.8 features only the numbers considered to be the final set. Note that the gap between the numbers of "annual average blue-/white-collar workers" and numbers of "average annual blue-/white-collar workers in sovkhozy, intermediary operations enterprises, and other supplementary agricultural enterprises" is mainly of tractor and automobile machinists (i.e. engineers, drivers).

One characteristic of the socialist economy was the large participation of women in production activity. Statistical table 3.9 shows the size of female labor in the agricultural sector. The table reveals that although the share of female agricultural sector workers gradually fell from 50% in 1960, even in 1980 it remained at around 40%. Furthermore, Statistical table 3.10 shows a progression which compares favorably with other sectors, whereby the average agricultural sector wage gradually increased after a period in which it was considerably lower than other sectors. The average wage for kolkhozniki was considerably lower than for sovkhoz members, as described above, but it also showed gradual improvement. Calculated using numbers from Statistical table 3.10, from 1960 to 1990, the nominal wages for blue-/white-collar workers increased by an annual rate of 5.9%, and the nominal pay for kolkhozniki increased by an average annual rate of 7.5%. Since there was no great inflation in the Soviet economy until the end of the 1980s, agricultural sector wages can be considered to have substantially increased in real terms.

4 Agriculture and agricultural statistics in present-day Russia

[7] Strictly speaking, statistically total workers were classified into "family of blue-/white-collar worker(s) engaged in personal subsidiary agricultural operations" and "other inhabitans (independent peasant farmers, kustar' artisans, etc)," as well as "blue-/white-collar workers" and "kolkhozniki."

This section will give an overview of agriculture and agricultural statistics in the Russian Federation, after the collapse of the Soviet Union.[8] The greatest change in agriculture in present-day Russia is probably changes in the forms of agricultural operations which accompanied the shift to a market economy. As previously mentioned, in the Soviet era kolkhozy, sovkhozy, and personal subsidiary operations were the three main forms of operations which sustained agriculture. From the market economy era, however, agricultural operations came to be divided into three forms, namely "agricultural enterprises," "dweller-managed operations," and "farmer-managed operations." "Agricultural enterprises" are the results of reorganizing Soviet-era kolkhozy, sovkhozy, and other organizations into joint-stock companies, production cooperatives, or limited liability corporations, or supplementary operations run by various enterprises and organizations in sectors such as mining, manufacturing, transport, and scientific research. Next, "dweller-managed operations" may be considered present-day versions of what was called "personal subsidiary operations" in the Soviet era. In other words, as with the Soviet era, the term indicates small-scale operations run by employees of the above-mentioned agricultural enterprises and by rural community residents on farming patches and vegetable gardens in the surrounds of their own households, as well as also indicating self-sufficient operations conducted by urban residents in outskirt areas. Next, "farmer-managed operations," also called "farmer(s)" or "independent self-managed farmer(s)", refer to operations by individuals independent of agricultural enterprises (including their families, relatives, and friends). The sum of the crop cultivation and livestock production undertaken by these three forms of operations provides agricultural output, and the output share per each of these forms is shown in Statistical table 4.1. Immediately after the beginning of the shift to a market economy it was expected that farmer-managed operations would support Russian agriculture, but even at present it would not be possible to say that these expectations have been realized.

At present, as explained in Suhara (2017), data on agricultural enterprises is collected within the framework of enterprise statistics, e.g. "annual structural corporate statistics". Since data on dweller-managed operations are considered difficult to collect, the size of their agricultural output and such are estimated based on sample surveys. As for farmer-managed operations, comprehensive surveys are conducted periodically, and for other years sample surveys are used. Actually, agricultural censuses were conducted already in 2006 and 2016. In addition, for non-agricultural enterprises,

[8] The account in this section draws upon Nobe (2012).

there are methods in use which do not directly collect data—for instance, estimations of areas sown and yields from past data (Rosstat 2006, pp.105;106).

There are two issues to be aware of when using agricultural statistics currently released. The first issue is related to the 2006 Agricultural Census mentioned above. This census was conducted in order to clarify the state of agriculture at the time of July 1, 2006, and as a result of the census, the basic values used to calculate official statistics have been revised considerably. Therefore there now exist, for example, both old indices which do not consider the 2006 Agricultural Census results and new indices which do. Revisions of previously-released old indices are thought to have been conducted retrospectively up to 1996. For instance in the 2009 edition of the *Russian Statistical Yearbook*, on p.409, there is the following note: "statistical data for 1996-2007 which has taken into consideration the results of the 2006 nationwide agricultural census should be published in the 2010 edition of the *Russian Statistical Yearbook* and the 2009 edition of *Russian Agriculture, Hunting and Forestry*, published by Rosstat." Yet, in practice, at present data concerning 1996-1999 has not been released; it seems that what has been made clear is limited to data from 2000 onwards. The indices featured in this paper are also influenced by such circumstances. Specifically, amongst the statistics in this paper, Statistical tables 3.2, 3.3, 3.4, 3.5, 3.6, and 4.1 are a mixture of new and old indices; there is a possibility that this also applies to Statistical tables 4.2 and 4.3. For particular details, please see the notes for each Table.

The second issue is related not only to agriculture but to all sectors of the economy: changes in economic sector classification. As is well known, Russia already began to move towards the "Russian Classification of Economic Activities" (OKVED), which is in accordance with EU classifications of forms of economic activity, and accordingly the previous sector name "Agriculture" was revised to "Agriculture, Hunting and Forestry." There were changes in classification which covered not only naming but also particular details; as a result, both new and old indicator series appear here. The statistics in this paper which are directly related to this are Statistical tables 4.2 and 4.3. In these tables both indicator series are shown together, allowing for comparison between the two.

Meanwhile, in terms of information disclosure, it may be said that agricultural statistics in the present-day Russia have shown great advances in comparison to the Soviet era. One example is grain yields, for which the Perestroika-era methods have been passed on and reports are made with data in clean weight. Further, whilst Section 3 of this paper described how the US CIA undertook

estimations of grain losses from US Military weather data for each region of the Soviet Union, outlets such as the *Russian Statistical Yearbook* now release details about the sizes of losses, seeding, feed, and even of emergency stocks—details which were not clear in the Soviet era. Based on many other points, Russian agricultural statistics can be said to have improved from the Soviet era. This paper will close using this statistical information to briefly describe the present state of Russian agriculture.

Statistical table 3.2 shows agricultural output indices not only for the Soviet era but also from the start of present-day Russia. According to this information, excluding 1997 the agriculture industry as a whole continued to decline until 1998. If 1990 output is taken as 100, the index reaches 56 at the bottom of 1998. The scale of this decline does not differ particularly from the slump in GDP for Russia as a whole, but due to the rapidity of the slump in the first half of the 1990s, the decline is greater than GDP in terms of square measure. Statistical table 3.2 also shows a slump in agricultural output from 1913 to 1921, as well as a slump in output borne from Stalin's collectivization of agriculture, but the decrease in output from the collapse of the Soviet Union was of the greatest scale in history, surpassing these other difficulties.

The grain output for the bottom year, 1998, is 41.0% of 1990 in yield amount (Statistical table 3.3), and 80.4% of 1990 in area sown (Statistical table 3.4). The size of the slump in yields per area unit reveals the progress of extensive farming in this period. Statistical table 4.2 also shows that from 1990 to 1998 the number of agricultural employees decreased only by 10%. Regardless, agricultural output decreased by 44%.

From 1998 Russian agriculture showed recovery along with other sectors of economy. Certainly import substitution following the great collapse in the ruble in 1998, and the acceleration in Russian economic recovery following the rise in crude oil prices, had positive effects on agricultural output. As shown in Statistical table 3.2, however, this recovery in agriculture was mainly due to crop farming; there has been, therefore, unsatisfactory recovery in livestock farming. Livestock products are losing ground to imports due to the rise in costs of domestic production. Yet, meanwhile, the crop-farming sector can be said to be recovering. With grains, for example, not only have yield amounts increased (47.9 million tons in 1998; average 85.2 million tons in 2006-2010), but the improvement in yield amounts per area sown is remarkable (0.94 tons per 1 hectare of seeded area in 1998; average 1.89 tons in 2006-2010). Area sown has continued to shrink, but it appears to have recently finally hit its bottom level. Taking into consideration the unstable production of the Soviet

era, the cessation of crop-farming agriculture on cultivated land which is limited due to climate may actually bring about efficient agricultural production, as this signifies concentration of production towards land with favorable conditions. Improved efficiency in grain production can also be seen from other statistics. For instance, there is a noticeable drop in recent years in losses rate (losses-yields), which can be calculated from the grain supply and expenditure balance charts now newly published in the *Russian Statistical Yearbook*: the rate was 3.0% in 1980, but 1.2% in 2005 and 1.3% in 2013 (*Russian Statistical Yearbook* 2001 edition, p.422; 2014 edition, p.391). Into the 21st century, influenced also by the high value of the ruble, Russia is overwhelmingly in debt in its trade balance for "foodstuffs and agricultural products" as a whole (e.g. 27.0 billon dollars in 2013). Nonetheless exports for "foodstuffs and agricultural products" are growing. Perhaps these conditions show a slight turn for the better amidst some difficult circumstances.

References

［Literature in Japanese］

Kikuchi, Masanori (1964) *A Study on the Serf Emancipation in Russia*, Ochanomizu shobo.

Miyanabe, Noboru (1967) An Essay on Soviet Agricultural Prices, Iwanami shoten.

Nakayama, Hiromasa (1976) *Contemporary Soviet Agriculture*, Tokyo University Press.

――――― (1981) *The Present Situation of Soviet Agriculture*, NHK Publishing.

Nobe, Kimihito (2012) "Russian Agriculture in the 2000s," in *A Study on the Medium- and Long-Term Outlook of Demand and Supply for Foodstuff in the World in the 22nd year of Heisei* , Policy Research Institute, Ministry of Agriculture, Forestry and Fisheries of Japan.

Sato, Tsuneaki (1975) *Contemporary Socialist Economies*, Iwanami shoten.

Shigemitsu, Akira (1979), *A Statistical Study on Soviet Agriculture*, the Japan Institute of International Affairs.

Tomioka, Shoichi (1998) *A Study on Russian Economic History*, Yuhikaku..

［Literature in English］

Falkus, Malcolm E. (1968) "Russia's National Income, 1913: A Revaluation," *Economica*, Vol. 35, Feb.

Jasny, N. (1947) "Intricacies of Russian National Income Indexes," *The Journal of Political Economy*, Vol. 74, No. 4, Aug.

JEC (Joint Economic Committee, Congress of the United States) (1982) *USSR: Measures of Economic Growth and Development, 1950–80*, U. S. GPO, Washington, D. C.

Mitchell, B. R. (ed.) (2007) *International Historical Statistics: Europe 1750-2005*, Sixth Edition, Palgrave Macmillan.

Schinke, E. (1972) "Soviet Agricultural Statistics," in V. G. Treml and J. P. Hardt (eds.) *Soviet Economic Statistics*, Duke University Press.

Suhara, Manabu (2017) "Russian Industrial Statistics," forthcoming.

［Literature in Russian］

Khromov, P. A. (1950) *Ekonomicheskoe razvitie Rossii v XIX–XX vekakh, 1800–1917* , Gosudarstvennoe izdatel'stvo politicheskoi literatury, Moscow.

Liashchenko, P. I. (1915) *Zernovoe khoziaistvo i khlebotorgovye otnosheniia Rossii i Germanii v sviazi s tomozhennym oblozheniem*, Saint Petersburg.

Nazarov, M. G. *et al*. (eds.) (1981) *Sotsial'no-ekonomicheskaia statistika: Slovar'*, Finansy i statistika, Moscow.

Nifontov, A. S. (1974) *Zernovoe proizvodstvo Rossii vo vtoroi polovine XIX veka: po materialam ezhegodnoi statistiki urozhaef evropeiskoi Rossii*, Izdatel'stvo Nauka, Moscow.

Rastiannikov, B. G. and I. V. Deriugina (2005) *Ekonomicheskii rost v agrarnom sektore Rossii: Problemy XX Veka*, Statistika Rossii, Moscow.

Rosstat (2006) *Metodologicheskie polozheniia po statistike*, vypusk piatyi, Rosstat, Moscow.

Savitskii, F. E., A. A. Kosynkin and G. K. Rusakov (1974) *Spravochnik po planirovaniiu sel'skogo khoziaistva*, Kolos, Moscow.

Vainshtein, Al'b L. (1969) *Narodnyi dokhod Rossii i SSSR: istoriia, metodologiia ischisleniia, dinamika*, Nauka, Moscow.

［Materials］

Imperial Russia Statistical Cronicle : Tsentral'nyi statistichekii komitet Ministerstva Vnutrennikh del, *Statistichekii vremennik Rossiiskoi Imperii*, St. Petersburg.

Imperial Russia Statistics : Tsentral'nyi statisticheskii komitet Ministerstva Vnutrennikh del, *Statistiki Rossiiskoi Impereii*, St. Petersburg.

Soviet Statistical Yearbook : Goskomstat SSSR, *Narodnoe khoziaistvo SSSR v 19xx g*., Moscow.

National Economy of the Soviet Union during the Great Patriotic War : Goskomstat SSSR, *Narodnoe khoziaistvo SSSR v Velikoi otechestvennoi voine 1941-1945 gg*., Moscow.

Soviet Agriculture, 1988 edition : Goskomstat SSSR, *Sel'skoe khoziaistvo SSSR*, Moscow.

Soviet Labor, 1988 edition : Goskomstat SSSR, *Trud v SSSR*, 1988, Moscow.

Russian Republic Statistical Yearbook : TsSU RSFSR, *Narodnoe khoziaistvo RSFSR v 19xx g.*, Moscow.

Russian Republic Labor, 1973 edition : TsSU RSFSR, *Trud v RSFSR*, Moscow.

Russian Republic Labor, 1985 edition : TsSU RSFSR, *Trud v RSFSR*, Moscow.

Russian Statistical Yearbook : *Rossiiskii statisticheskii ezhegodnik*, Moscow.

Russian Agriculture : *Goskomstat Rossii, Sel'skoe khoziaistvo v Rossii*, Moscow.

Russian Agriculture, Hunting and Forestry : Rosstat, *Sel'skoe khoziaistvo, okhota i lesovodstvo v Rossii*, Moscow.

Russian Labor and Employment : Rosstat, *Trud i zaniatost' v Rossii*, Moscow.

Statistical table 1.1: Total yield quantity of agricultural produce, 1820-1913 (in thousand tons)

(1) 50 Provinces of European Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total grains
	Winter wheat	Spring wheat	Total	Winter rye	Spring rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Grain beans	Total grains	Potatoes	(New definition)
1800-13																155,000		
1834-40																179,000		
1841-47																209,700		
1851																228,700		
1852																233,800		
1853																201,400		
1854																193,600		
1855																151,600		
1856																193,800		
1857																217,100		
1858																235,300		
1859																170,300		
1860																221,900		
1861																214,200		
1862																209,500		
1863																245,200		
1864																195,000		
1865																179,700		
1866																220,600		
1867																192,900		
1868																209,200		
1869																204,600		
1870																283,700		
1871			4,629			13,297	5,783	1,916		1,057						223,324	4,634	
1872			3,895			12,555	8,101	2,295		1,554						246,053	6,633	
1873			3,757			13,990	6,809	2,245		1,349						239,920	5,679	
1874			6,150			16,025	7,005	2,213		1,327						271,052	5,830	
1875			3,488			12,209	5,880	1,886		833						208,494	5,664	
1876			3,768			11,928	7,674	2,515		1,502						240,028	6,785	
1877			6,117			14,153	7,290	2,534		1,513						267,146	6,512	
1878			4,592			16,188	7,899	2,400		1,553						276,961	6,936	
1879			3,988			12,307	7,687	2,353		1,206						239,668	5,982	
1880			3,576			11,113	7,149	2,168		1,318						221,855	7,118	
1881																296,100	8,208	
1882																257,900	8,284	
1883	1,416	4,444	5,860			13,156	8,920	2,925	242	1,463	515	540	1,352			34,973	6,750	
1884	2,063	4,847	6,910			16,507	7,764	2,891	214	1,274	430	415	1,200			37,606	7,520	
1885	1,995	2,606	4,601			16,814	6,043	2,158	152	794	456	293	609			31,920	6,194	
1886	1,040	3,183	4,223			15,885	8,848	2,875	195	1,470	600	519	1,664			36,281	7,117	
1887	2,555	4,646	7,201			17,839	9,606	3,616	165	1,148	342	517	1,362			41,796	8,014	
1888	3,184	4,847	8,031			18,046	8,778	3,952	230	1,017	738	477	1,513			42,782	8,363	
1889	1,078	3,533	4,612	13,011	211	13,221	7,602	2,491	185	1,192	300	407	867			30,878	7,706	
1890	2,053	3,393	5,446	15,947	182	16,130	8,356	3,447	196	836	641	411	1,375			36,838	8,369	
1891	1,532	2,837	4,369	11,746	192	11,937	6,600	2,959	110	761	765	334	933			28,768	7,327	
1892	1,770	4,511	6,281	13,970	161	14,132	6,783	3,690	143	880	572	429	1,549			34,459	11,742	
1893	2,134	7,492	9,626	17,186	233	17,419	10,207	6,473	231	969	1,034	620	2,179			48,758	14,637	
1894	2,793	6,451	9,244	20,393	183	20,576	10,194	5,162	231	810	492	734	1,188			48,630	13,570	
1895	2,757	5,197	7,954	18,068	168	18,237	9,782	4,577	236	793	633	711	1,131			44,056	14,899	
1896	2,150	6,026	8,176	17,676	130	17,805	9,710	4,538	341	868	436	609	2,064			44,547	14,899	
1897	1,395	5,097	4,780	14,823	104	14,927	7,944	4,428	233	868	1,155	515	1,199			36,050	15,996	
1898	2,594	6,502	9,096	20,246	145	20,391	8,127	5,545	90	867	1,004	508	1,662			47,291	16,992	
1899	2,079	5,888	7,967	21,566	120	21,686	12,187	3,916	281	1,079	575	578	1,900			50,168	17,818	
1900	2,051	6,636	8,687	20,936	117	21,052	10,799	4,076	243	808	649	565	1,438			48,317	16,887	
1901	3,306	5,403	8,708	17,157	120	17,278	7,658	4,124	108	693	1,544	345	1,347			41,805	15,429	
1902	3,988	8,619	12,607	20,469	119	20,588	11,726	5,985	221	1,238	1,026	576	2,581			56,549	19,688	
1903	3,484	8,888	12,372	20,264	140	20,404	9,440	6,307	142	767	1,026	469	1,580	158	54	52,507	18,379	43,279
1904	3,392	10,758	14,151	22,542	146	22,688	14,603	6,330	472	910	481	689	1,223	252	56	61,546	19,191	47,250
1905	3,573	8,710	12,283	15,871	123	15,994	11,141	6,101	317	894	572	469	1,279	135	38	49,048	18,683	38,081
1906	4,140	5,243	9,383	14,006	109	14,115	7,909	5,304	68	880	1,507	426	1,317	127	49	40,910	17,151	33,176
1907	2,328	6,936	9,264	17,514	96	17,609	10,593	6,042	108	924	1,064	477	1,810	185	52	47,891	18,920	37,536
1908	1,986	8,437	10,424	16,999	114	17,113	10,792	6,476	165	891	1,261	482	1,599	218	54	49,202	18,573	38,683
1909	3,187	12,783	15,970	19,763	127	19,890	13,941	8,320	334	1,036	742	662	2,131	366	51	63,026	20,818	49,502
1910	3,759	11,265	15,024	18,940	118	19,058	12,624	8,021	234	1,116	1,602	637	2,175	282	52	60,492	24,443	48,202
1911	3,099	6,327	9,426	16,219	92	16,311	10,026	6,979	52	998	1,723	553	1,310	195	59	47,379	23,163	37,608
1912	3,642	9,214	12,856	22,976	98	23,074	12,523	7,714	110	1,158	1,598	737	2,123	267	60	61,892	25,195	49,696
1913	4,498	13,363	17,862	22,007	160	22,167	14,383	9,488	159	1,066	1,519	733	2,073	273	59	69,450	23,786	55,398

(2) 72 Provinces of Imperial Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total grains
	Winter wheat	Spring wheat	Total	Winter rye	Spring rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Bean grains	Total grains	Potatoes	new definition)
1900	3,674	7,838	11,512	23,052	320	23,372	12,391	5,159	256	898	870	710	1,857			57,025	26,188	
1901	5,022	6,620	11,642	18,877	299	19,175	9,058	5,223	119	785	1,737	487	1,665			49,893	23,941	
1902	5,994	10,535	16,529	22,987	356	23,343	13,508	7,364	234	1,335	1,236	756	2,988			67,294	28,335	
1903	5,453	11,460	16,913	22,663	501	23,164	11,608	7,783	157	867	1,289	620	2,066	161	70	64,467	24,683	53,123
1904	5,609	12,536	18,145	25,159	456	25,615	16,318	7,539	489	980	662	801	1,504	255	64	72,053	24,839	56,053
1905	5,996	11,149	17,145	18,306	421	18,727	13,554	7,706	326	1,008	853	606	1,789	140	54	61,713	28,583	48,189
1906	6,491	7,513	14,004	16,537	405	16,942	10,388	6,802	75	979	1,797	601	1,781	131	68	53,370	26,052	43,181
1907	4,407	9,566	13,973	20,016	522	20,538	13,180	7,695	116	1,019	1,293	655	2,374	189	70	60,843	28,633	47,922
1908	1,986	8,437	10,424	16,999	114	17,113	10,792	6,476	165	891	1,261	482	1,599	218	54	49,202	18,573	38,683
1909	5,626	15,687	21,313	22,468	311	22,779	16,624	10,311	339	1,129	1,007	849	2,720	369	69	77,072	32,444	60,887
1910	6,766	14,340	21,106	21,692	346	22,038	15,181	9,993	237	1,227	1,962	782	2,637	285	64	75,162	36,283	60,331
1911	5,149	8,714	13,863	19,083	273	19,356	12,458	8,954	57	1,081	2,083	716	1,729	198	71	60,298	31,738	48,109
1912	6,650	13,133	19,783	26,209	312	26,520	15,502	10,105	116	1,245	2,024	889	2,807	270	76	78,991	37,693	63,834
1913	8,072	18,022	26,094	25,029	439	25,468	17,794	12,291	165	1,160	1,850	913	2,592	276	71	88,326	35,598	70,879

(3) 90 Provinces of Imperial Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total grains
	Winter Wheat	Spring Wheat	Total	Winter Rye	Spring Rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Bean grains	Total grains	Potatoes	new definition)
1909	6,475	16,554	23,028	22,493	460	22,952	16,881	10,662	352	1,168	1,402	853	2,861	379	78	80,161	32,781	63,736
1910	7,612	15,146	22,758	21,713	516	22,229	15,451	10,321	248	1,260	2,591	785	2,733	293	71	78,376	36,557	63,289
1911	5,847	9,488	15,335	19,107	417	19,524	12,715	9,264	67	1,108	2,418	720	1,837	206	79	62,988	32,006	50,558
1912	7,585	14,228	21,813	26,245	447	26,692	15,812	10,482	129	1,275	2,391	893	2,906	280	86	82,391	37,981	66,945
1913	9,028	18,940	27,968	25,110	577	25,688	18,152	12,624	176	1,187	2,122	917	2,688	285	77	91,522	35,893	73,732

NB: The unit for "Total grains" until 1882 for (1) 50 Provinces of European Russia is thousand chetvert's. Note that the 1883 grains total of 34,973 thousand tons is equivalent to 280,419 thousand chetvert's. See the main text for the meaning of "Total grains (new definition)."

Source:

(1) 50 Provinces of European Russia: 1800-13, 1834-1840, 1841-47 use Khromov (1950), pp.434, 436, 438. 1851-82 use Nifontov (1974), pp. 117, 183, 185. 1883-1913 use *Imperial Russia Statistics*, various issues.

(2) 72 Provinces of Imperial Russia: *Imperial Russia Statistics*, various issues.

(3) 90 Provinces of Imperial Russia: *Imperial Russia Statistics*, various issues.

Statistical table 1.2: Area sown (in million hectares)

(1) 50 Provinces of European Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total grains
	Winter Wheat	Spring Wheat	Total	Winter Rye	Spring Rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Grain beans	Total grains	Potatoes	new difinition
1872			11.6			26.9	13.3	6.3									1.2	
1881			11.7			26.1	14.1	5.0									1.5	
1892			13.2			27.4	13.8	6.3			0.9						2.2	
1893	2.543	10.577	13.119	24.685	0.378	25.063	13.404	6.435	0.436	2.562	0.914	0.882	2.993			65.994	2.292	
1894		10.169			0.291		13.286	6.373	0.399	2.424	0.845	0.933	2.587			65.713	2.337	
1895	3.071	9.830	12.901	25.038	0.281	25.319	13.742	6.394	0.418	2.321	0.776	0.993	2.372			65.236	2.353	
1896	3.041	11.055	14.096	25.735	0.249	25.984	14.388	6.820	0.463	2.418	0.883	1.026	2.383			68.461	2.474	
1897	2.902	11.501	14.402	25.104	0.236	25.340	14.645	6.965	0.467	2.376	0.895	1.062	2.494			68.645	2.559	
1898	3.018	11.547	14.565	24.926	0.266	25.193	14.423	7.115	0.464	2.298	0.951	0.965	2.537			68.510	2.658	
1899	2.983	12.406	15.389	25.408	0.239	25.647	14.607	7.063	0.289	2.343	0.973	0.938	2.703			69.952	2.671	
1900	3.123	13.043	16.166	26.360	0.231	26.590	15.128	7.113	0.424	2.317	1.096	0.949	2.604			72.388	2.739	
1901	3.252	13.705	16.957	26.411	0.265	26.676	15.370	7.333	0.435	2.274	1.093	0.940	2.586			73.664	2.851	
1902	3.436	13.791	17.227	26.426	0.218	26.644	15.068	7.372	0.378	2.169	1.157	0.862	2.766			73.644	2.893	
1903	3.548	14.150	17.698	26.657	0.246	26.903	15.205	7.785	0.393	2.238	1.116	0.886	2.822			75.046	2.939	
1904	3.399	15.060	18.459	26.303	0.249	26.552	15.283	8.118	0.460	2.164	1.174	0.923	2.852	0.351	0.066	75.984	3.095	61.118
1905	3.730	15.714	19.444	25.951	0.216	26.166	15.616	8.185	0.478	2.069	1.161	0.894	2.551	0.346	0.049	76.564	2.910	61.344
1906	3.922	15.904	19.827	26.715	0.239	26.955	15.456	8.018	0.461	2.044	1.041	0.812	2.516	0.311	0.044	77.129	2.948	62.028
1907	3.714	14.720	18.434	26.373	0.195	26.568	15.356	8.253	0.292	1.994	1.173	0.760	2.879	0.290	0.051	75.709	3.008	60.694
1908	2.913	15.939	18.852	25.273	0.214	25.487	15.248	8.864	0.313	2.127	1.202	0.773	3.132	0.376	0.063	75.998	3.084	61.188
1909	3.442	15.733	19.175	25.611	0.196	25.807	15.210	8.818	0.342	2.033	1.234	0.777	2.846	0.411	0.054	76.242	3.138	61.496
1910	3.385	17.603	20.988	25.266	0.204	25.469	15.671	9.265	0.344	1.993	1.156	0.855	2.607	0.428	0.056	78.349	3.260	63.162
1911	3.647	17.612	21.259	26.112	0.204	26.315	15.532	9.298	0.327	1.933	1.285	0.846	2.417	0.407	0.053	79.212	3.303	64.141
1912	3.816	16.239	20.055	26.126	0.184	26.309	15.075	9.316	0.204	1.890	1.372	0.865	2.447	0.385	0.055	77.533	3.366	62.898
1913	3.720	16.709	20.429	26.484	0.216	26.699	15.390	9.896	0.197	1.997	1.369	0.916	2.513	0.398	0.051	79.406	3.504	64.466

(2) 72 Provinces of Imperial Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total grains
	Winter Wheat	Spring Wheat	Total	Winter Rye	Spring Rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Grain beans	Total grains	Potatoes	new difinition
1899	5.178	14.942	20.120	28.102	0.704	28.805	17.046	8.286	0.308	2.516	1.167	1.142	3.209			82.600	3.634	
1900	5.424	15.736	21.160	29.038	0.690	29.728	17.736	8.392	0.442	2.494	1.322	1.163	3.120			85.556	2.673	
1901	5.597	16.369	21.966	29.127	0.741	29.868	17.995	8.681	0.453	2.462	1.277	1.155	3.134			86.991	3.936	
1902	5.920	16.372	22.292	29.281	0.624	29.905	17.461	8.785	0.394	2.361	1.360	1.061	3.333			86.954	3.974	
1903	6.092	17.053	23.145	29.608	0.712	30.319	17.735	9.309	0.410	2.432	1.350	1.098	3.429			89.228	4.044	
1904	6.031	17.909	23.940	29.258	0.711	29.970	17.966	9.718	0.481	2.346	1.436	1.125	3.483	0.357	0.080	90.464	4.174	72.935
1905	6.380	18.783	25.163	28.826	0.632	29.458	18.309	9.791	0.488	2.236	1.422	1.089	3.114	0.353	0.064	91.069	4.001	73.177
1906	6.849	18.890	25.740	29.693	0.637	30.331	18.350	9.635	0.470	2.215	1.302	1.007	3.094	0.315	0.060	92.144	4.083	74.169
1907	6.577	18.031	24.608	29.300	0.745	30.045	18.407	9.983	0.301	2.157	1.409	0.954	3.520	0.294	0.064	91.384	4.168	73.336
1908	5.476	19.912	25.389	28.143	0.397	28.539	18.496	10.735	0.323	2.278	1.474	0.965	4.051	0.379	0.076	92.251	4.256	74.429
1909	6.150	20.309	26.460	28.539	0.577	29.116	18.715	10.804	0.349	2.189	1.538	0.967	3.788	0.414	0.068	93.926	4.357	75.693
1910	6.398	22.347	28.745	28.177	0.563	28.740	19.145	11.402	0.349	2.153	1.477	1.040	3.573	0.433	0.068	96.624	4.501	77.980
1911	6.773	23.091	29.864	29.084	0.542	29.627	19.247	11.610	0.335	2.077	1.601	1.029	3.313	0.411	0.064	98.702	4.563	79.931
1912	6.999	21.880	28.879	29.167	0.514	29.682	18.618	11.603	0.212	2.034	1.649	1.045	3.250	0.389	0.067	96.971	4.658	78.809
1913	7.043	23.363	30.406	29.697	0.632	30.329	19.325	12.463	0.204	2.145	1.710	1.097	3.432	0.401	0.062	101.112	4.825	82.250

(3) 90 Provinces of Imperial Russia

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Wheat			Rye														Total
	Winter Wheat	Spring Wheat	Total	Winter Rye	Spring Rye	Total	Oats	Barley	Emmer	Buckwheat	Corn	Peas	Millet	Lentils	Grain beans	Total grains	Potatoes	new difinition
1910	7.724	23.648	31.371	28.207	0.802	29.008	19.459	11.878	0.366	2.219	2.089	1.045	3.716	0.444	0.077	101.152	4.551	82.214
1911	7.984	24.410	32.394	29.140	0.790	29.930	19.552	12.062	0.352	2.147	1.986	1.034	3.483	0.428	0.074	102.941	4.610	83.891
1912	8.231	23.363	31.594	29.219	0.762	29.981	18.970	12.093	0.230	2.102	2.067	1.050	3.396	0.406	0.078	101.483	4.711	82.997
1913	8.519	24.924	33.443	29.834	0.900	30.734	19.714	13.007	0.223	2.214	2.135	1.103	3.586	0.415	0.072	106.160	4.877	86.933

Source: 1872, 1881, and 1892 for (1) 50 Provinces of European Russia use Mitchell (2007), p.255. Other years use *Imperial Russia Statistics*, various issues.

Statistical table 1.3: Livestock animal numbers (50 Provinces of European Russia; per million; winter time)

	1	2	3	4
	Cattle	Pigs	Sheep	Horses
1864	21.0	9.4	43.3	14.7
1866	21.0	9.4	44.2	15.5
1870	21.4	9.1	45.3	15.6
1877	27.3	10.8	51.8	17.6
1882	23.8	9.2	47.5	20.0
1883	23.6	9.4	46.7	17.9
1888	24.6	9.2	44.5	19.7
1889	…	…	…	…
1890	25.5	9.6	46.1	19.8
1891	25.3	9.6	39.8	17.3
1892	24.0	8.8	40.0	16.6
1893	…	…	…	…
1894	24.1	8.8	37.3	16.7
1895	24.5	9.2	38.2	17.0
1896	29.5	13.3	46.4	18.8
1897	30.7	12.9	45.8	18.8
1898	30.2	12.0	46.3	19.1
1899	30.9	11.6	45.5	19.6
1900	31.7	11.8	47.6	19.7
1901	31.9	12.1	38.8	20.2
1902	32.2	11.6	47.8	20.5
1903	31.8	11.4	46.9	20.3
1904	31.9	12.0	46.5	20.7
1905	31.2	11.5	45.4	20.8
1906	30.5	11.9	42.2	20.5
1907	29.7	11.6	40.7	20.5
1908	29.7	11.4	39.9	20.6
1909	30.5	11.3	39.9	21.3
1910	31.3	12.0	40.7	21.9
1911	31.0	12.7	40.2	21.8
1912	31.0	12.6	39.6	22.1
1913	32.0	13.5	41.4	22.8

Source: 1964 uses *Imperial Russia Statistical Cronicle* , 1866 edition, otdel vtoroi, pp. 242-243. Other years use Mitchell (2007), p.394.

Statistical table 2.1: Agricultural production indices for the Soviet Union (1913 index = 100)

	1	2	3		1	2	3
	Agriculture				Agriculture		
		Crops	Livestock			Crops	Livestock
1913	100	100	100	1956	193	201	177
1917	88	81	100	1957	197	198	196
1920	67	64	72	1958	218	227	205
1921	60	55	67	1959	219	215	221
1922	75	75	73	1960	224	226	219
1926	118	114	127	1961	230	230	229
1927	121	113	134	1962	233	229	235
1928	124	117	137	1963	216	209	221
1929	121	116	129	1964	247	270	217
1930	117	126	100	1965	252	247	254
1931	114	126	93	1966	274	281	264
1932	107	125	75	1967	278	281	271
1933	101	121	65	1968	290	299	278
1934	106	125	72	1969	280	280	278
1935	119	138	86	1970	309	313	302
1936	109	118	96	1971	313	309	312
1937	134	150	109	1972	300	285	311
1938	120	120	120	1973	348	363	330
1939	121	125	119	1974	339	326	347
1940	141	155	114	1975	317	292	338
1941	88	86	87	1976	338	323	348
1942	54	55	52	1977	351	318	381
1943	52	52	48	1978	361	333	384
1944	77	85	61	1979	350	315	380
1945	86	93	72	1980	343	307	375
1946	95	100	87	1981	340	299	376
1947	122	140	89	1982	358	326	386
1948	136	158	96	1983	380	346	410
1949	140	156	109	1984	380	339	416
1950	140	151	118	1985	380	338	418
1951	130	133	126	1986	400	359	437
1952	142	148	129	1987	398	349	443
1953	146	148	141	1988	405	344	461
1954	153	153	153	1989	410	347	468
1955	170	175	160	1990	399	330	462

NB: In light of restrictions of the materials, the values were produced as follows: The 1913-70 indices use 1973 prices; 1926/27 prices were used for 1940-44, 1965 prices for 1970-75, 1973 prices for 1975-85, and 1983 prices for 1985-90; the values were calculated proportionally using overlap years.

Source: *Soviet Statistical Yearbook* , 1922-1972 Anniversary edition, p.219; *National Economy of the Soviet Union during the Great Patriotic War* , p.83; *Soviet Agriculture 1988 edition* , p.25; *Soviet Statistical Yearbook* , various issues.

Statistical table 3.1: Gross agricultural output value for the Russian Republic (in billion rubles)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	Gross agricultural output									Crop farming output					Livestock output				
	in 1956 prices	in 1958 prices	in 1965 prices	in 1973 prices	in 1983 prices	Production Index in 1958 prices	Production Index in 1965 prices	Production Index in 1973 prices	Production Index in 1983 prices	in 1956 prices	in 1958 prices	in 1965 prices	in 1973 prices	in 1983 prices	in 1956 prices	in 1958 prices	in 1965 prices	in 1973 prices	in 1983 prices
1913				18.4				46.1					8.8					9.6	
1940				23.2	35.8			58.1	58.0				12.7	19.8				10.5	16.0
1949-1953	156.8	15.4				60.9				96.3	8.6				60.5	6.8			
1950		15.6	19.8			61.7	61.7				8.7					6.9			
1954-1958	203.3	21.0				83.0				115.0	11.1				88.3	9.9			
1953	159.0	16.6				65.6				87.9	8.6				71.1	8.0			
1955		19.0	24.2			75.1	75.4				10.1					8.9			
1958	235.0	24.2				95.7				132.1	13.0				102.9	11.2			
1959		24.7				97.6					12.4					12.3			
1960		25.3	32.1	39.9	61.7	100.0	100.0	100.0	100.0		13.1		17.7	27.7		12.2		22.2	34.0
1961		25.9	32.9			102.4	102.5				13.2					12.7			
1962		26.9	34.1			106.3	106.2				13.7					13.2			
1963		24.2	30.7			95.7	95.6				11.8					12.4			
1964		27.6	35.0			109.1	109.0				15.5					12.1			
1965		27.6	34.9	43.4	67.1	109.1	108.7	108.8	108.8		13.6	15.7	18.0	28.3		14.0	19.2	25.4	38.8
1966			38.1				118.7					18.1					20.0		
1967			39.5				123.1					18.7					20.8		
1968			41.6				129.6					20.3					21.3		
1969			38.9				121.2					17.6					21.0		
1970			43.5	54.0	83.4		135.5	135.3	135.2			20.7	23.8	37.2			22.8	30.2	46.2
1971			42.9	53.3			133.6	133.6				19.2	22.1				23.7	31.2	
1972			39.2	48.8			122.1	122.3				16.0	18.3				23.2	30.5	
1973			47.9	59.5			149.2	149.1				23.4	27.0				24.5	32.5	
1974			45.8	56.8			142.7	142.4				19.7	22.4				26.1	34.4	
1975			42.7	53.9	83.2			135.1	134.8			17.5	20.5	32.3			25.2	33.4	50.9
1976				55.3				138.6					23.3					32.0	
1977				58.3				146.1					23.1					35.2	
1978				59.9				150.1					24.4					35.5	
1979				56.4				141.4					21.3					35.1	
1980				56.0	86.3			140.4	139.9				21.8	34.1				34.2	52.2
1981				53.7				134.6					19.5					34.2	
1982				59.0				147.9					23.4					35.6	
1983				63.2				158.4					25.6					37.6	
1984				61.8				154.9					24.0					37.8	
1985				62.1	95.6			155.6	154.9				24.1	37.6				38.0	58.0
1986					102.0				165.3					40.8					61.2
1987					100.8				163.4					38.9					61.9
1988					104.1				168.7					39.4					64.7
1989					105.9				171.6					39.8					66.1
1990					102.1				165.5					36.7					65.4

NB: 1956 prices are based on the pricing levels before the redenomination implemented in January 1961. The "Production indices in 19-- prices" columns (6-9) contain indices calculated from gross output values evaluated in 19-- prices, using 1960 values as 100.
Source: *Russian Republic Statistical Yearbook* , various issues.

Statistical table 3.2: Gross agricultural output indices, 1913-2010 (1940 index = 100; 1990 index = 100)

	1 Total Agriculture	2 Crop farming	3 Livestock
1913	79	69	91
1940	100	100	100
1945			
1948			
1949			
1950	106	97	128
1951			
1952			
1953			
1954			
1955	129	113	170
1956			
1957			
1958			
1959			
1960	171	146	226
1961	175	147	237
1962	182	153	246
1963	164	132	231
1964	186	172	226
1965	186	151	261
1966	203	175	271
1967	210	180	282
1968	222	196	289
1969	206	170	285
1970	232	199	309
1971	229	185	322
1972	209	154	315
1973	256	226	333
1974	244	189	355
1975	228	169	342
1976	234	192	328
1977	247	190	360
1978	253	201	364
1979	239	176	359
1980	237	180	350
1981	227	161	350
1982	250	193	365
1983	267	211	385
1984	261	198	387
1985	263	199	389
1986	280	216	411
1987	277	206	415
1988	286	208	434
1989	291	210	443
1990	281	194	439
1990	100	100	100
1991	95.5	100.4	92.7
1992	86.5	95.0	81.7
1993	82.7	92.3	77.3
1994	72.7	82.7	67.1
1995	66.9	78.9	60.2
1996	63.5	79.1	53.6
1997	64.5	84.9	50.9
1998	56.0	66.0	50.0
1999	58.3	72.0	49.6
2000	62.8	81.8	50.0
2001	67.1	89.7	51.8
2002	67.7	88.5	53.5
2003	67.6	88.9	53.2
2004	69.3	94.5	52.3
2005	70.4	97.1	52.5
2006	72.5	97.3	55.4
2007	74.9	99.6	57.8
2008	83.0	117.5	59.5
2009	84.1	115.9	62.3
2010	74.6	88.3	62.8

NB: The 1913-1940 indices use 1973 prices, the 1940-1975 indices use 1965 prices, the 1975-1985 indices use 1973 prices, the 1985-1990 indices use 1983 prices. Values were calculated proportionally using overlap years. The 1990-2000 indices were calculated using old index output increase rates which do not acknowledge results of the 2006 Agricultural Census; the indices from 2001 onwards were calculated using new index output increase rates which do acknowledge the 2006 Census results.

Source: *Russian Republic Statistical Yearbook* , various issues; *Russian Agriculture* , 2000 edition, pp.33, 34; *Russian Agriculture , Hunting and Forestry* , 2004 edition, pp.37, 38; *Russian Agriculture, Hunting and Forestry* , 2009 edition, pp.50, 51; *Russian Agriculture, Hunting and Forestry* , 2013 edition, pp.54, 55.

Statistical table 3.3: Gross yield of main agricultural crops

	1	2	3	4	5	6	7	8
	Total grains (in million tons)			Flax fiber (in thousand tons)	Sunflowers (in thousand tons)	Potatoes (in million tons)	Vegetables (in million tons)	Fruits, berries and grapes (in thousand tons)
		Excluding unripe corn	Revised to clean weight					
1913	50.5	50.5	50.5	314.2	659.5	16.1		
1928	50.0	50.0	50.0	298.0	1556	31.0		
1932		47.0	47.5					
1937		69.0	70.4					
1940	55.6	55.6		238.6	1429.8	36.4	6.4	1,093
1941		45.5		133.0	830	24.7		
1942		24.0		210.0	246	22.5		
1943		19.8		154.0	400	30.4		
1944		26.9		133.0	467	35.2		
1945		25.4	25.4	103.0	315	34.7	5.8	
1946		21.2	21.2	85.2	387	35.1	5.2	
1947		35.7	35.7	102.1	655	42.5	8.4	
1948		34.2	34.2	154.7	889	55.9	7.2	
1949		38.9	38.9	209.3	880	49.3	5.7	
1950	46.8	46.8	46.8	172.1	866.6	50.1	5.0	567
1951	47.8	47.5	47.5	119.4	903	31.8	4.1	
1952	52.0	51.9	51.9	150.7	1092	37.9	4.6	
1953	48.2	48.2	48.2	98.4	1407.5	42.4	6.0	932
1949-1953	46.7	46.7		150.0	1030	42.3	5.1	
1954	56.3	56.3	56.3	111.7	1231	42.6	6.7	
1955	59.4	58.4	54.7	229.4	1960	40.4	7.0	
1956	72.0	71.2	66.5	304.5	2167	55.7	7.5	
1957	59.2	58.5	54.9	260.6	1429	46.9	7.5	
1958	79.0	76.8	72.9	253.0	2428.0	48.2	7.1	1,007
1954-1958	65.2	64.2		231.9	1842.8	46.7	7.2	
1959	69.6	68.4	64.9	232.4	1401.5	50.2	7.7	1,438
1960	78.9	76.2	72.6	240.4	1906.1	46.7	8.1	1,034
1961	76.3	73.7	70.3	228.2	2151.4	46.6	8.6	1,132
1962	89.2	86.8	83.1	238.2	2250.6	39.8	8.0	1,314
1963		65.8	62.8	197.5	2115.7	39.0	7.4	1,492
1964		87.0	83.2	210.3	2972.5	50.8	9.4	1,561
1965		69.7	66.3	262.8	2365.2	49.8	8.3	1,857
1966		99.9	95.6	257.0	2800	44.5	8.2	1,677
1967		89.5	84.8	274.0	3300	52.9	10.0	2,133
1968		109.6	103.8	212.0	3500	55.3	8.6	2,721
1969		89.9	83.9	245.4	2838.4	50.9	8.7	1,738
1970		113.5	107.4	248.4	3066.1	53.9	10.1	3,045
1971		104.8	98.9	241.2	2611	48.1	9.4	3,169
1972		91.6	86.0	213.0	2145	34.8	8.0	1,988
1973		129.0	121.5	171.7	3698	61.9	11.9	2,977
1974		111.8	105.1	164.0	3407	39.6	10.8	3,048
1975		77.5	72.4	243.9	2193	51.1	10.6	3,293
1971-1975			96.7	206.6		47.1	10.1	2,895
1976		127.1	119.0	192.0	2800	38.9	9.3	3,618
1977		108.7	101.6	216.0	2800	45.1	9.7	2,907
1978		136.3	127.4	117.0	2500	39.9	10.9	3,432
1979		91.9	84.8	138.0	2300	43.8	10.9	2,848
1980		105.1	97.2	120.0	2000	37.0	11.1	2,884
1976-1980			106.0	156.9		40.9	10.4	3,138
1981		78.8	73.8	98.0	2000	32.1	11.1	3,518
1982		105.2	98.0	161.0	2500	40.7	12.7	3,314
1983		111.5	104.3	215.0	2600	42.1	12.8	3,972
1984		92.4	85.1	161.0	1900	43.4	12.9	3,963
1985		106.6	98.6	126.1	2621	33.8	11.1	3,400
1981-1985		98.9	92.0	151.9		38.4	12.1	3,634
1986		118.0	107.5	155.8	2363	43.1	11.7	3,709
1987		109.1	98.6	139.6	3067	38.0	11.2	3,086
1988		102.8	93.7	129.0	2958	33.7	11.5	3,327
1989		113.2	104.8	125.3	3789	33.8	11.2	3,322
1990		127.0	116.7	71.3	3427	30.8	10.3	2,979
1986-1990		114.0	104.3	124.2		35.9	11.2	3,289
1991			89.1	101.9	2895.8	34.3	10.4	2,747
1992			106.9	77.9	3109.8	38.3	10.0	3,369
1993			99.1	58.2	2765.1	37.7	9.8	3,193
1994			81.3	54.1	2553.4	33.8	9.6	2,405
1995			63.4	68.7	4199.6	39.9	11.3	2,521
1996			69.3	59.0	2764.9	38.7	10.7	3,461
1997			88.6	23.4	2831.4	37.0	11.1	3,097
1998			47.9	33.5	2999.6	31.4	10.5	2,606
1999			54.7	23.7	4149.6	31.3	12.3	2,354
2000			65.5	51.2	3915.0	34.0	12.5	3,401
2001			85.2	58.0	2685	35.0	13.3	3,075
2002			86.6	37.7	3684	32.9	13.0	3,561
2003			67.2	55.3	4871	36.7	14.8	3,451
2004			78.1	57.8	4801	35.9	14.6	3,935
2005			78.2	55.9	6441	37.3	15.2	3,710
2006			78.2	36.1	6743	28.3	11.4	2,174
2007			81.5	47	5671	27.2	11.5	2,818
2008			108.2	52	7350	28.8	13.0	2,669
2009			97.1	52	6454	31.1	13.4	3,067
2010			61.0	35	5354	21.1	12.1	2,473

NB: The values for "Total grains, excluding unripe corn" in 1928, 1932, and 1937 are estimates calculated from sown area and the yield rates of Rastiannikov et al (2006, pp.138-142).
The yield amounts for fruits, berries and grapes from 2006, published in the 2008 edition of the *Russian Statistical Yearbook* , have become considerably smaller than previously-released values.
This change is probably due to acknowledgement of the results of the 2006 Agricultural Census. Yield amounts for 2004 and 2005 based on the old indices are 3,192 and 4,370, respectively.
As detailed in the main text, the yield amounts here for 2006 and afterwards show new index values from the 2008 edition onwards.
Source: *Russian Republic Statistical Yearbook* , various issues; *National Economy of the Soviet Union during the Great Patriotic War* , pp.96-98; *Russian Statistical Yearbook* , various issues.

Statistical table 3.4: Area sown with agricultural crops (in thousand hectares)

	1	2	3	4	5	6	7	8	9
	Total area sown	Grains	Flax fiber	Sunflowers	Potatoes	Vegetables	Feed crops	Fallow land	Fruits, berries and grapes
1913	69,798	62,939	968.6	876.0	2,116	267.9	1,360		
1928	74,161	61,423	1,223	2,551	3,759	486	2,659		
1929									
1930									
1931									
1932	90,196	68,950	2,190	3,922	4,331	1,215			
1933									
1934									
1937	92,405	73,064	1,757	2,397	4,724	820	7,052		
1940	92,076	70,134	1,524.8	2,452.0	4,077.6	826.8	10,432	22,330	737
1941	90,324	68,494	1,088.6		4,046.0				
1942	70,668	54,576	1,007.9		3,628.5				
1943	68,772	51,420	916.6		4,419.2				
1944	65,510	48,926	809.9		4,815.1				
1945	67,061	50,871	769.0	1,709	5,114.3	1,028	5,998		
1947									
1950	88,953	64,948	1,384.0	2,312.2	4,970.5	715.8	11,796		460
1952									
1953	97,051	68,161	841.1	2,579.6	4,658	690.9	17,632		721
1954	103,264	72,544	660.8	2,703.6	4,778	795.9	19,099		
1955	112,545	77,537	902.3	2,788.2	5,164	788.6	22,837		
1956	114,405	75,775	1,220.8	2,731.1	5,215	830.8	26,014		
1957	113,626	73,828	1,078.8	2,017.7	5,608	738.6	27,895		
1958	114,697	72,524	1,000.3	2,368.1	5,400	729.6	30,016		928.6
1959	115,018	69,103	1,014.6	2,188.6	5,402	718.3	33,874		1,062.0
1960	120,734	71,372	1,023.5	2,293.5	5,108.2	709.1	37,305		1,192.6
1961	121,723	74,509	1,004.8	2,331.7	4,979	684.7	35,001		1,250.4
1962	129,691	79,181	1,051.0	2,501	4,956	695	37,811		
1963	130,493	79,398	820	2,442	4,776	682	38,569		1,389.5
1964	126,755	81,645	923	2,507	4,734	682	32,208		1,435.1
1965	123,945	77,594	887.8	2,733.9	4,723.3	632.6	33,554	9,880	1,464.9
1966	122,567	76,102	832.2	2,850.7	4,565	628.8	33,972		1,486.0
1967	122,713	74,872	819	2,700	4,536	638	35,587		1,482.6
1968	122,680	74,290	777	2,811	4,501	626	36,238		1,467
1969	122,554	73,511	746	2,757	4,390	643	37,286		
1970	121,912	72,689	727	2,744	4,391	676	37,427	12,089	1,515
1971	121,921	71,801	691	2,520	4,335	676	38,661	12,078	1,501
1972	123,923	73,131	692	2,303	4,404	706	39,221	10,400	1,463
1973	125,753	76,623	688	2,693	4,467	731	37,104	8,684	1,452
1974	126,033	76,486	641	2,656	4,457	732	37,642	8,187	1,448
1975	126,542	77,023	664	2,060	4,449	735	38,179	7,306	1,419
1976	126,771	77,196	656	2,528	3,890	645	38,474	7,287	1,388
1977	126,525	78,393	655	2,594	3,889	647	36,958	7,833	1,372
1978	126,600	77,027	650	2,607	3,860	701	38,329	7,923	1,372
1979	125,319	75,680	512	2,391	3,801	707	38,816	8,878	1,326
1980	124,815	75,465	595	2,380	3,790	742	38,421	9,506	1,299
1981	122,802	74,093	442	2,373	3,740	731	38,119	11,387	1,290
1982	122,000	72,000					39,400	12,400	1,282
1983	121,000	70,700					39,600	13,400	1,284
1984	120,700	69,700					40,800	13,500	1,128
1985	119,121	68,138	550	2,320	3,538	676	40,830	14,542	1,084
1986	119,175	67,501	523	2,112	3,506	679	41,813	14,616	1,056
1987	119,677	66,686	510	2,377	3,412	685	42,792	13,940	1,032
1988	119,631	66,025	493	2,438	3,290	694	43,396	13,716	1,016
1989	119,058	64,938	460	2,565	3,235	670	43,978	13,722	1,001
1990	117,705	63,068	418	2,739	3,124	618	44,560	13,808	1,013
1991	115,508	61,783	328	2,576	3,187	662	44,039	14,688	1,008
1992	114,591	61,939	327	2,889	3,404	682	42,474	13,026	1,007
1993	111,827	60,939	263	2,923	3,548	684	40,987	13,498	1,009
1994	105,340	56,280	135	3,133	3,337	704	39,596	16,948	1,030
1995	102,540	54,705	177	4,127	3,409	758	37,056	17,383	1,034
1996	99,626	53,388	153	3,874	3,404	737	35,931	17,766	1,020
1997	96,554	53,634	114	3,588	3,352	749	33,251	17,779	1,007
1998	91,660	50,724	107	4,168	3,265	743	30,860	18,565	982
1999	88,329	46,555	104	5,585	3,256	820	30,022	17,584	977
2000	84,670	45,585	108	4,643	2,834	744	28,899	18,042	838
2001	83,820	47,176	127	3,827	2,740	720	27,652	17,483	809
2002	83,468	47,396	111	4,126	2,646	703	26,777	16,311	765
2003	78,297	42,072	118	5,259	2,531	713	25,369	16,334	739
2004	77,323	43,597	112	4,862	2,415	673	23,652	16,010	703
2005	75,837	43,593	96	5,568	2,277	641	21,610	14,895	668
2006	75,277	43,174	84	6,155	2,129	635	20,395	13,859	613
2007	74,759	44,265	74	6,326	2,069	624	19,532	13,612	600
2008	76,923	46,742	77	6,199	2,104	641	18,560	13,732	599
2009	77,805	47,553	69	6,196	2,193	653	18,288	13,972	594
2010	75,188	43,194	51	7,153	2,212	662	18,071	14,660	580

NB: Figures from 2000 onwards are the new area sown indices which acknowledge the 2006 Agricultural Census results, as featured from the 2009 edition of the *Russian Statistical Yearbook* .

Source: *Russian Republic Statistical Yearbook* , various issues; *National Economy of the Soviet Union during the Great Patriotic War* , pp.109-111; *Russian Statistical Yearbook* , various issues.

Statistical table 3.5: Livestock numbers (beginning of year, in millions)

	1	2	3	4	5	6	7	8	9
	Cattle		Pigs	Sheep and goats			Horses	Reindeer	Poultry
		Cows (female)			Sheep	Goats			
1916	33.0	17.3	11.3	47.0					
1923	26.7	16.4	5.6	37.4					
1928	37.6	19.9	13.1	59.3					
1930	30.4	17.9	6.9	49.7					
1931	25.5	16.1	5.6	36.9					
1932	23.4	14.6	5.5	28.1					
1933	21.4	13.3	5.9	23.4					
1934	21.8	13.2	7.0	23.7					
1935	25.3	13.1	10.6	26.2					
1936	29.8	13.6	15.9	31.5					
1937	29.4	13.9	10.4	32.4					
1938	31.2	14.8	14.4	41.0					
1940	28.3	14.3	12.2	46.0					
1941	27.8	14.2	12.1	51.2	46.7	4.5	11.3	1.9	135.2
1942	21.2	11.1	6.8	40.5					
1943	18.8	10.1	4.9	32.0					
1944	22.3	11.7	4.2	33.0					
1945	24.6	12.2	4.6	34.2					
1946	26.2	12.9	4.9	34.7					
1947	25.4	13.0	4.1	32.5					
1948	27.1	13.4	4.7	35.8					
1949	29.7	13.6	7.5	40.7					
1950	31.5	13.7	10.7	45.7					
1951	30.2	13.3	11.9	46.2	39.5	6.7		2.1	159.7
1952	31.1	13.6	13.9	53.3					
1953	29.5	13.2	14.5	53.9	46.3	7.6		2.1	
1954	28.4	13.4	16.6	56.5	48.6	7.8		2.1	226.7
1955	29.4	14.1	15.7	57.0				2.1	
1956	30.4	14.7	16.1	58.6				2.0	
1957	31.6	15.3	19.8	59.2	53.0	6.3		2.1	
1958	33.9	16.5	22.2	61.8	56.9	4.9		1.9	
1959	36.1	17.3	24.0	65.5	60.9	4.6		1.9	267.7
1960	37.6	17.6	27.1	67.5	63.4	4.1		2.0	284.3
1961	38.2	17.9	29.4	65.4	61.5	4.0	5.0	2.1	287.7
1962	41.7	18.8	33.0	68.6	64.6	3.9		2.2	296.0
1963	44.7	19.7	36.7	69.2	65.4	3.7		2.2	306.1
1964	43.4	19.9	19.2	62.2	59.4	2.9		2.3	245.1
1965	44.9	20.2	26.6	59.3	56.5	2.7		2.3	247.8
1966	48.2	20.7	29.5	61.4	58.7	2.7	4.0	2.4	269.7
1967	49.8	21.3	28.6	63.1	60.5	2.6		2.4	
1968	50.2	21.4	25.5	63.9	61.3	2.6		2.4	
1969	49.8	21.3	24.3	64.6	62.0	2.6		2.5	
1970	49.4	21.0	27.4	63.4	60.8	2.5		2.4	320.1
1971	51.6	20.6	33.2	67.0	64.2	2.7	3.6	2.5	358.2
1972	53.2	20.7	35.6	67.7	64.9	2.8		2.4	380.5
1973	53.7	21.0	32.7	66.3	63.4	2.9		2.3	382.9
1974	54.7	21.4	35.0	67.3	64.2	3.1		2.4	408.0
1975	56.5	21.8	36.5	68.7	65.6	3.1		2.2	434.3
1976	57.6	21.8	27.8	66.1	63.2	2.9	3.0	2.3	394.1
1977	56.9	21.8	30.6	65.4	62.6	2.8	2.8	2.3	429.3
1978	58.0	22.1	34.8	66.7	63.9	2.8	2.7		482.5
1979	58.5	22.2	36.2	67.5	64.7	2.8	2.6		519
1980	58.6	22.2	36.4	66.9	64.0	2.9	2.6		543
1981	58.1	22.2	36.0	65.0	62.0	3.0	2.5	2.3	564
1982	58.1	22.2	36.0	64.5	61.6	2.9	2.5		581
1983	58.6	22.2	37.9	64.9	61.8	3.1	2.5		605
1984	59.6	22.2	39.1	66.3	63.2	3.1	2.6		618
1985	60.0	22.0	38.7	64.5	61.7	2.8	2.6		617
1986	59.6	21.6	39.0	63.4	60.6	2.8	2.6	2.2	628
1987	60.5	21.3	40.2	64.1	61.3	2.8	2.6	2.2	632
1988	59.8	21.0	39.2	63.0	60.3	2.7	2.6	2.3	637
1989	59.3	20.8	39.8	62.7	59.9	2.8	2.6		646
1990	58.8	20.8	40.0	61.3	58.4	2.9	2.6		654
1991	57.0	20.5	38.3	58.2	55.2	3.0	2.6		660
1992	54.7	20.6	35.4	55.3	52.2	3.1	2.6		652
1993	52.2	20.2	31.5	51.4	48.2	3.2	2.6		568
1994	48.9	19.8	28.6	43.7	40.6	3.1	2.5		565
1995	43.3	18.4	24.9	34.5	31.8	2.7	2.4		491
1996	39.7	17.4	22.6	28.0	25.3	2.7	2.4		423
1997	35.1	15.9	19.1	22.8	20.3	2.5	2.2		372
1998	31.5	14.5	17.3	18.8	16.5	2.3	2.0		360
1999	28.5	13.5	17.2	15.6	13.4	2.2	1.8		356
2000	28.1	13.1	18.3	14.8	12.6	2.2	1.7		346
2001	27.5	12.7	15.8	15.0					341
2002	27.4	12.3	16.2	15.6					347
2003	26.8	11.9	17.6	16.4					346
2004	25.1	11.1	16.3	17.3					343
2005	23.2	10.2	13.7	18.1					342
2006	21.6	9.5	13.8	18.6					357
2007	21.6	9.4	16.2	20.2					375
2008	21.5	9.3	16.3	21.5					389
2009	21.0	9.1	16.2	21.8	19.4	2.4	1.4		405
2010	20.7	9.0	17.2	22.0	19.9	2.1	1.4		434
2011	20.0	8.8	17.2	21.8	19.8	2.0	1.3		449

NB: From 2000 onwards, values from the new indices which acknowledge the 2006 Agricultural Census results are used.

Source: *Russian Republic Statistical Yearbook* , various issues; *National Economy of the Soviet Union during the Great Patriotic War* , pp.119-120; *Russian Statistical Yearbook* , various issues; *Russian Agriculture* , 1998 edition, pp.66-68.

Statistical table 3.6: Output quantities of livestock produce (in million tons)

	1	2	3	4	5	6	7	8
	Meat (slaughtered weight)					Milk	Eggs (in billions)	Wool (in thousand tons)
		Beef and veal	Pork	Mutton and lamb	Poultry Meat			
1913	2.437	1.106	0.768	0.367	0.196	19.3	7.1	94.0
1917	2.6					17.8		
1922	1.1					16.9		
1940	2.373	1.041	0.710	0.457	0.140	17.832	6.577	97.998
1941	2.291					15.859	5.170	98.7
1942	1.347					12.999	3.832	80.7
1943	1.281					13.574	2.907	55.7
1944	1.154					15.118	2.398	54.0
1945	1.486	0.805	0.293	0.320	0.052	16.635	2.785	58.7
1946	1.753	1.013	0.332	0.323	0.066	16.900	2.9	60.0
1947	1.383	0.816	0.223	0.268	0.052	18.600	2.7	63.0
1948	1.710	0.974	0.329	0.322	0.066	20.600	3.6	77.0
1949	2.119	1.072	0.532	0.377	0.112	21.500	4.9	89.0
1950	2.646	1.340	0.711	0.407	0.153	21.400	6.019	90.9
1951	2.390	1.041	0.801	0.291	0.217	21.507	7.102	100.9
1952	2.887	1.315	0.923	0.375	0.224	21.272	8.366	111.8
1953	3.174	1.207	1.210	0.388	0.276	21.1119	9.2607	121.392
1954	3.264	1.137	1.365	0.370	0.254	22.042	9.811	120.0
1955	3.436	1.245	1.298	0.463	0.250	24.610	10.714	140.9
1956	3.488	1.335	1.280	0.477	0.247	27.700	11.1	141.0
1957	3.750	1.322	1.541	0.449	0.302	31.100	12.4	149.9
1958	3.9118	1.484	1.507	0.488	0.312	32.9873	12.7601	159.767
1959	4.6181	1.775	1.719	0.588	0.393	34.5659	14.4669	180.994
1960	4.4916	1.748	1.605	0.553	0.384	34.5227	15.7048	178.658
1961	4.4547	1.551	1.788	0.517	0.438	34.6744	16.6382	180.865
1962	4.8673	1.783	1.928	0.572	0.442	35.7	17.000	185.093
1963	5.5011	2.082	2.218	0.620	0.442	34.6	16.400	181.203
1964	4.1706	1.921	1.282	0.525	0.313	35.7	15.500	166.254
1965	5.2027	2.165	2.075	0.497	0.368	40.1491	16.7935	172.027
1966	5.5266	2.407	2.167	0.466	0.392	41.9771	18.3858	174.818
1967	5.9472	2.774	2.171	0.505	0.398	44.6246	19.7075	190.057
1968	6.0354	3.021	1.994	0.493	0.415	45.8831	20.5640	198.304
1969	6.023	3.030	1.936	0.478	0.443	44.852	21.535	200.654
1970	6.213	2.883	2.195	0.449	0.554	45.371	23.594	209.113
1971	6.836	2.971	2.631	0.475	0.627	45.228	26.350	218.466
1972	6.970	3.049	2.667	0.455	0.653	44.310	27.993	213.009
1973	6.763	3.053	2.457	0.432	0.672	47.015	29.654	208.422
1974	7.421	3.328	2.774	0.445	0.728	48.930	32.343	226.871
1975	7.548	3.341	2.810	0.459	0.787	48.066	33.371	226.635
1976	6.745	3.461	2.061	0.383	0.694	46.8	32.5	208
1977	7.313	3.574	2.375	0.380	0.860	49.7	35.5	226
1978	7.753	3.611	2.622	0.393	1.010	49.3	37.7	226
1979	7.587	3.459	2.581	0.372	1.069	48.6	38.2	234
1980	7.427	3.274	2.579	0.338	1.134	46.8	39.5	213
1981	7.476	3.240	2.600	0.349	1.190	45.5	41.3	226
1982	7.647	3.243	2.686	0.325	1.299	47.4	42.0	217
1983	8.287	3.488	2.955	0.327	1.420	50.2	43.6	220
1984	8.541	3.577	3.033	0.344	1.483	50.4	44.2	224
1985	8.513	3.575	2.978	0.321	1.532	50.169	44.277	217.204
1986	8.916	3.756	3.093	0.345	1.621	52.217	46.195	226.081
1987	9.432	3.991	3.264	0.346	1.721	52.880	47.447	216.2
1988	9.813	4.150	3.399	0.371	1.776	54.535	49.144	227.3
1989	10.082	4.256	3.499	0.385	1.831	55.742	49.024	230.0
1990	10.112	4.329	3.480	0.395	1.801	55.715	47.470	226.7
1991	9.375	3.989	3.190	0.347	1.751	51.9	46.9	204
1992	8.260	3.632	2.784	0.329	1.428	47.2	42.9	179
1993	7.513	3.359	2.432	0.359	1.277	46.5	40.3	158
1994	6.803	3.240	2.103	0.316	1.068	42.2	37.5	122
1995	5.796	2.734	1.865	0.261	0.859	39.2	33.8	93
1996	5.336	2.630	1.705	0.230	0.690	35.8	31.9	77
1997	4.854	2.395	1.546	0.199	0.630	34.1	32.2	61
1998	4.703	2.247	1.505	0.178	0.690	33.3	32.7	48
1999	4.313	1.868	1.485	0.144	0.748	32.3	33.1	40
2000	4.446	1.898	1.578	0.140	0.768	32.3	34.1	40
2001	4.451	1.872	1.498	0.133	0.884	32.9	35.2	40
2002	4.694	1.957	1.583	0.136	0.953	33.5	36.3	43
2003	4.993	2.002	1.743	0.134	1.048	33.3	36.6	45
2004	5.046	1.954	1.686	0.145	1.192	31.9	35.9	47
2005	4.990	1.809	1.569	0.154	1.388	31.1	37.1	49
2006	5.278	1.722	1.699	0.156	1.632	31.3	38.2	50
2007	5.790	1.699	1.930	0.168	1.925	32.0	38.2	52
2008	6.268	1.769	2.042	0.174	2.217	32.4	38.1	53
2009	6.719	1.741	2.169	0.183	2.555	32.6	39.4	55
2010	7.167	1.727	2.331	0.185	2.847	31.8	40.6	54

NB: Excluding 2001 and 2002, values from the new indices which acknowledge the 2006 Agricultural Census results are used from 2000 onwards. This approach was unavoidable because new index values for 2001 and 2002 are not obtainable.

Source: *Russian Republic Statistical Yearbook* , various issues; *National Economy of the Soviet Union during the Great Patriotic War* , pp.113-114; *Russian Statistical Yearbook* , various issues.

Statistical table 3.7: Basic indicators for kolkhozy and sovkhozy

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	Number of kolkhozy (including fishing kolkhozy)	Only agricultural kolkhozy	Number of kolkhoz-participating households	Number of kolkhozniki participating in public kolkhoz activity	Gross income of kolkhozy	Area sown with grains	Excluding unripe corn	Output quantity of grains (weight initially recorded in accounts)	Clean weight	Output quantity of meat (all types)	Number of sovkhozy	Total number of sovkhozy employees	Number of employees involved in basic production activities in sovkhozy	Gross income of sovkhozy	Area sown with grains	Excluding unripe corn	Output quantity of grains (weight initially recorded in accounts)	Note: including unripe corn	Clean weight	Output quantity of meat (all types)
	in thousands, at end of year	in thousands, at end of year	in millions, at end of year	in millions, annual average	in billion rubles, nominal prices	in million hectares	in million hectares	in million tons	in million tons	slaughtered weight, in million tons	at end of year	in thousands, at end of year	in thousands, at end of year	in billion rubles, nominal prices	in million hectares	in million hectares	in million tons	in million tons	in million tons	slaughtered weight, in million tons
1928	19	19	0.2								775									
1932	154	150	9.1			48.1					2,418									
1937	172	171	11.0			65.9					2,543									
1940	167.3	167	11.0			63.5				0.6	2,680		823.7		5.481		4.663			0.1663
1941	121.3										2,189									
1942	118.4										1,636									
1943	144.4										2,080									
1944	152.8										2,214									
1945	154.6	155	10.4								2,234									
1950	70	68	10.0			57.9				0.6	2,953		976.7		5.285		4.904			0.1600
1952	56	55	9.4			61.4					2,779									
1953	55	53	9.2	11.8		61.3				1.0	2,780		1,074.7		5.288		5.145			0.2832
1954	52	51	9.1			64.5					2,817		1115		6.552					
1955	51	50	9.1			66.0					2,825		1210		9.944					
1956	49	48	9.1			63.9					2,793		1,268.0		10.267					
1957	45	44	8.5			53.6					3,144		1,823.5		18.649					
1958	38	37	8.4	11.4	5.8	53.1	52.0	53.2		1.2	3,171		2,122.4		19.367	18.9	21.750	21.2		0.5115
1959	28.4	27.6	8.2	10.9		50.4				1.6	3,358		2,279		18.823		18.015			0.6609
1960	21.5	20.8	7.1	9.3	5.8	45.7	44.2	47.0		1.5	4,047		3,288		26.088	25.4	27.357	26.8		0.8634
1961	19.0	18.5	6.6	8.3		42.7				1.3	4,544		3,982		32.196		30.559			0.9949
1962	18.6	18.1	6.4	8.0	6.6	44.4	42.5	48.5		1.4	4,604		4,124		34.386	33.5	35.017	34.4		1.1370
1963	18.1	17.7	6.3	7.8	6.6		42.8	37.1		1.5	4,817		4,074			33.4		25.5		1.314
1964	17.7	17.2	6.3	7.8	7.5		44.2	47.3		1.2	5,125		4,078			34.0		35.5		0.960
1965	16.4	15.9	5.9	7.3	7.0		40.4	39.4		1.4	6,321	4,571	4,302			33.8		26.7		1.256
1966	16.3	15.9	5.8	7.2			39.2	50.8		1.5	6,664		4,470			33.6		44.2		1.3
1967	16.0	15.6	5.7	7.1			38.5	47.3		1.7	7,114		4,446			33.0		37.6		1.5
1968	15.7	15.3	5.6	7.0			38.1	57.8		1.7	7,518		4,462			32.9		46.4		1.6
1969	14.6	14.3	5.3	6.6			36.4	48.6		1.8	8,182		4,600			33.7		36.6		1.7
1970	14.1	13.7	5.1	6.3	8.9		36.0	58.7		1.8	8,594	4,939	4,569	7.2		33.1		48.8		1.8
1971	13.7	13.4	5.0	6.0			34.4	52.7		2.0	8,897	5,127	4,728			33.8		46.4		2.0
1972	13.6	13.3	5.0	5.9			34.7	44.1		2.0	9,015	5,109	4,696			34.6		42.3		2.2
1973	13.3	13.0	4.9	5.8			36.2	65.6		2.0	10,308	5,479	5,039			38.7		59.6		2.2
1974	13.1	12.8	4.8	5.7			35.9	58.7		2.2	10,502	5,568				38.9		49.6		2.8
1975	12.9	12.6	4.8	5.5	7.6		36.1	39.4		2.2	10,624	5,576				39.1		35.3		2.9
1976	12.7	12.4	4.7	5.4			36.1	65.9		1.8	11,321	5,825				40.2		59.5		2.6
1977	12.5	12.2	4.6	5.2			36.3	55.0		2.0	11,580	5,884				41.1		51.9		3.0
1978	12.4	12.1	4.6	5.1			35.6	68.8		2.0	11,687	5,862				40.4		65.7		3.1
1979		12.0	4.5	5.0			35.0	44.0		1.9	11,714	5,863				39.1		45.3		3.1
1980		12.0	4.5	4.8	5.4		34.9	51.8	47.9	1.6	11,817	5,860		7.8		39.1		50.5	46.7	3.1
1981		11.9	4.5	4.7	5.0		34.1	38.8		1.6	12,003	5,843				38.5		37.6		3.2
1982		12.0	4.5	4.6	6.1		33.0	52.8		1.6	12,164	5,860				37.3		49.2		3.4
1983		12.0	4.5	4.6	13.5		32.3	56.1		1.8	12,281	5,891				36.6		51.8		3.7
1984		12.0	4.5	4.6	12.7		31.8	41.9		1.8	12,372	5,898				36.0		44.0		3.8
1985		12.1	4.4	4.5	12.7		31.2	52.3	48.4	1.8	12,449	5,881		18.1		35.1		50.7	46.9	3.9
1986		12.1		4.4	14.6		30.9	58.8	53.6	1.9	12,542	5,877		18.0		34.8		55.2	50.3	4.2
1987		12.1		4.3	15.1		30.5	53.5	48.3	2.1	12,810	5,910		20.8		34.9		53.4	48.2	4.5
1988		12.2		4.1	20.2		30.3	50.7	46.2	2.2	12,832	5,736		28.9		34.3		49.8	45.4	4.7
1989		12.5		4.0	22.2		29.6	56.6	52.5	2.3	12,915	5,593		30.6		33.7		53.7	49.8	4.8
1990		12.8		4.0	24.5		28.8	64.7	59.9	2.3	13,048	5,474		34.1		32.5		58.9	53.6	4.7
1991		13.1		3.9	40.8		28.2		45.7	2.0	12,409	5,000		59.1		30.6			38.2	3.7

Source: *Russian Republic Statistical Yearbook* , various issues; *National Economy of the Soviet Union during the Great Patriotic War* , pp.134,139.

Statistical table 3.8: Average annual numbers of blue- and white-collar workers and kolkhozniki in the agricultural sector (in thousands)

	1	2	3	4
	Average annual blue- and white-collar workers in the agricultural sector (1)	Blue- and white-collar workers in sovkhozy, intermediary operations enterprises, and other supplementary agricultural production	Annual average kolkhozniki (3)	(1) + (3)
1922	745	113		
1926	1,002	131		
1928	984	172	495	1,479
1940	1,687	1,079	16,879	18,587
1945	1,767	1,389		
1950	2,134	1,490	13,735	15,869
1955	3,602	1,605		
1960	4,069	3,664	9,262	13,331
1961				
1962				
1963				
1964				
1965	4,988	4,782	7,343	12,331
1966				
1967				
1968				
1969				
1970	5,186	4,913	6,303	11,489
1971			6,035	
1972			5,903	
1973				
1974				
1975	5,500	5,163	5,492	10,992
1976				
1977				
1978				
1979				
1980	5,697	5,254	4,832	10,529
1981	5,713	5,248	4,698	10,413
1982	5,760	5,277	4,649	10,360
1983	5,803	5,305	4,619	10,403
1984			4,600	
1985	5,819	5,300	4,492	10,311
1986	5,744	5,253	4,445	10,189
1987	5,744	5,253	4,302	10,046
1988	5,578	5,099	4,103	9,681
1989	5,409	4,946	4,050	9,459
1990	5,308	4,865	3,979	9,287

NB: "Kolkhozniki" does not include kolkhozniki engaged in fishing. The "annual average kolkhozniki" number for 1980 is 4,841 in *Russian Republic Labor, 1985 Edition* , but the tab;e uses the 4,832 figure from the 1990 edition of the *Russian Republic Statistical Yearbook* . Since figures for 1981-1983 are not features in the yearly editions of the *Statistical Yearbook* , figures from *Russian Republic Labor, 1985 Edition* have been used. The "annual average kolkhozniki" number for 1984 is based on the 4.6 (million) figure in the 1985 edition of the *Russian Republic Statistical Yearbook* .

Source: *Russian Republic Statistical Yearbook* , various issues; *Soviet Labor, 1988 edition* , p.76; *Russian Republic Labor, 1973 edition* , p.159; *Russian Republic Labor, 1985 edition* , pp.23, 29, 30, 147.

Statistical table 3.9: Number and ratio of female workers in the agricultural sector (%)

	Annual average female blue- and white-collar workers		Female blue- and white-collar workers in sovkhozy and other agricultural enterprises		Average annual female kolkhozniki	
	(in thousands)	(%)	(in thousands)	(%)	(in thousands)	(%)
1926	191	19.1	55	42.0		
1928	241	24.5	78	45.3		
1940	507	30.1	366	33.9		
1950	923	43.3	748	50.2		
1960	1,764	43.4	1,648	45.0	4,909	53.0
1961		44				
1962		44				
1963						
1964						
1965	2,250	45.1	2,162	45.2	3,671	50.0
1966						
1967						
1968						
1969				43		
1970	2,325	44.8	2,209	45.0	3,062	48.6
1971		45		45	2,896	48.0
1972		45		45	2,821	47.8
1973		44		45	2,776	48
1974		44		45	2,662	47
1975	2,435	44.3	2,300	44.5	2,545	46.3
1976					2,491	46
1977					2,370	45
1978					2,312	45
1979					2,189	44
1980	2,402	42.2	2,243	42.7	2,128	44.0
1981	2,384	41.7	2,220	42.3	2,033	43.3
1982	2,391	41.5	2,221	42.1	1,984	42.7
1983	2,395	41.3	2,223	41.9	1,940	42.0
1984						
1985	2,367	40.7	2,195	41.4		41
1986						40
1987						39
1988						
1989	2,153	39.8	1,994	40.3		
1990	2,101	39.6	1,947	40.0		

NB: “Kolkhozniki” does not include kolkhozniki working in fishing.

Source: *Russian Republic Statistical Yearbook* , various issues; *Russian Republic Labor, 1973 edition* , pp.126, 159; *Russian Republic Labor , 1985 edition* , pp.36, 37, 150; *Soviet Labor, 1988 edition* , p.108.

Statistical table 3.10: Average monthly wages for the whole economy and the agricultural sector (in rubles)

	1	2	3	4
	Whole economy	Blue- and white-collar workers in the agricultural sector	Blue- and white-collar workers in sovkhozy and other agricultural enterprises	Kolkhozniki
1940	33.9	23.4	22.4	
1945	44.9	23.3	21.7	
1950	65.7	39.6	39.0	
1951	67.3			
1952	68.5			
1953	69.7			
1954	72.5			
1955	73.9	49.5	47.4	
1956	75.7			
1957	78.3			
1958	80.4			
1959	81.9			
1960	83.1	55.5	54.3	30
1961	86.4			
1962	89.2			
1963	90.9			
1964	93.6			
1965	99.0	76.2	75.9	50.3
1966	102.8		81.2	59.3
1967	107.7		87.0	65.4
1968	116.3		95.7	70.9
1969	120.9		96.0	72.3
1970	126.1	103.7	103.6	78.5
1971	130.4	109.2	109.3	81.5
1972	135.2	115.7	115.9	84.5
1973	140.5	122.7	122.2	93
1974	147.7	129.5	129.8	97
1975	153.2	134.6	134.9	100
1976	158.4	141.5	142.0	106
1977	162.9	146.9	147.3	113
1978	168.2	151.7	152.3	118
1979	172.1	153.7	154.1	120
1980	177.7	156.8	157.1	124
1981	181.8	160.8	161.0	129
1982	187.3	170.3	171.0	138
1983	190.8	183.4	184.6	153
1984	195.5	192.6	194.6	
1985	201.4	198.4	200.3	166
1986	207.8	211.0	213.7	180
1987	216.1	219.8	222.3	189
1988	235.2	232.7	234.0	200
1989	258.6	258.9	260.4	221
1990	296.8	307.2	310.1	265

Source: *Russian Republic Statistical Yearbook* , various issues; *Russian Republic Labor, 1973 edition* , p.253; *Russian Republic Labor, 1985 edition* , pp. 186,199,189,282; *Soviet Labor, 1988 edition* , pp.158,159.

Statistical table 4.1: Structure of agricultural production by form of management (%, nominal prices)

	1	2	3
	Agricultural enterprises	Dweller-managed	Farmer-managed
1970	68.6	31.4	0
1975	70.3	29.7	0
1980	71.0	29.0	0
1985	76.9	23.1	0
1990	73.7	26.3	…
1991	68.8	31.2	…
1992	67.1	31.8	1.1
1993	57.0	39.9	3.1
1994	54.5	43.8	1.7
1995	50.2	47.9	1.9
1996	49.0	49.1	1.9
1997	46.5	51.1	2.4
1998	39.2	58.6	2.2
1999	41.2	56.3	2.5
2000	45.2	51.6	3.2
2001	43.9	52.4	3.7
2002	39.8	56.5	3.7
2003	42.6	52.5	4.9
2004	45.8	47.9	6.3
2005	44.6	49.3	6.1
2006	44.9	48.0	7.1
2007	47.6	44.3	8.1
2008	48.1	43.4	8.5
2009	45.4	47.1	7.5
2010	44.5	48.3	7.2

NB: "…" indicates unknown data. Excluding 2001 and 2002, values from the new indices which acknowledge the 2006 Agricultural Census results are used from 2000 onwards. This approach was unavoidable because new index values for 2001 and 2002 are not obtainable.

Source: *Russian Statistical Yearbook* , various issues.

Statistical table 4.2: Average annual numbers of workers by sector (in thousands)

	1	2	3	4	5	6
	Whole economy	Agriculture	Share of workers in agriculture (%)	Whole economy	Agriculture, hunting and forestry	Share of workers in agriculture, hunting and forestry (%)
1970	64,006	12,237	19.1	64,006		
1975	68,847	11,218	16.3			
1980	73,275	10,719	14.6	73,275		
1985	74,937	10,405	13.9			
1990	75,325	9,727	12.9	75,325		
1991	73,848	9,736	13.2			
1992	72,071	10,101	14.0			
1993	70,852	10,103	14.3			
1994	68,484	10,278	15.0			
1995	66,409	9,744	14.7	66,330		
1996	65,950	9,261	14.0	65,700		
1997	64,693	8,592	13.3	64,600		
1998	63,812	8,724	13.7	63,700		
1999	63,963	8,495	13.3	64,100		
2000	64,327	8,370	13.0	64,517	8,996	13.9
2001	64,710	7,936	12.3	64,980	8,509	13.1
2002	65,359	7,683	11.8	65,574	8,229	12.5
2003	65,666	7,208	11.0	65,979	7,796	11.8
2004	66,407	6,891	10.4	66,407	7,430	11.2
2005				66,792	7,381	11.1
2006				67,174	7,141	10.6
2007				68,019	6,925	10.2
2008				68,474	6,675	9.7
2009				67,463	6,733	10.0
2010				67,577	6,656	9.8

NB: On the left of the table above are the old indices; on the right are the new indices first published from the 2006 edition of the *Russian Statistical Yearbook* , following the shift to the new economic sector classifications. The new indices on the right have the following annotation: "Data for 1995-2006 excludes the Chechen Republic."

Source: *Russian Statistical Yearbook* , various issues; *Russian Labor and Employment* , 2007 edition, p.187.

Statistical table 4.3: Average monthly nominal wages for enterprises (in thousand rubles until 1997; thereafter in rubles)

	1	2	3	4	5	6
	Average wage for whole economy (1)	Average wage for agricultural sector (2)	Ratio of (2) to (1) (%)	Average wage for whole economy (3)	Average wage for agriculture, hunting and forestry sector (4)	Ratio of (4) to (3) (%)
1970	0.121	0.090	74.4			
1975	0.149	0.135	90.6			
1980	0.174	0.142	81.6			
1985	0.199	0.184	92.5			
1990	0.303	0.289	95.4	0.303		
1991	0.548	0.459	83.8	0.548		
1992	6.0	4.0	66.7	6.0		
1993	58.7	36.0	61.3	58.7		
1994	220.4	111.3	50.5	220.4		
1995	472.4	236.7	50.1	472.4	258.5	54.7
1996	790.2	382.0	48.3	790.2		
1997	950.2	439.1	46.2	950.2		
1998	1,051.5	467.6	44.5	1,051.5		
1999	1,522.6	629.1	41.3	1,522.6		
2000	2,223.4	891.0	40.1	2,223.4	985.1	44.3
2001	3,240.4	1,306.4	40.3	3,240.4	1,434.6	44.3
2002	4,360.3	1,752.1	40.2	4,360.3	1,876.4	43.0
2003	5,498.5	2,163.8	39.4	5,498.5	2,339.8	42.6
2004	6,739.5	2,791.8	41.4	6,739.5	3,015.4	44.7
2005				8,554.9	3,646.2	42.6
2006				10,633.9	4,568.7	43.0
2007				13,593.4	6,143.8	45.2
2008				17,290.1	8,474.8	49.0
2009				18,637.5	9,619.2	51.6
2010				20,952.2	10,668.1	50.9

NB: On the left of the table above are the old indices; on the right are the new indices first published from the 2006 edition of the *Russian Statistical Yearbook* , following the shift to the new economic sector classifications.
Source: *Russian Statistical Yearbook* , various issues; *Russian Labor and Employment* , 2007 edition, p.368.