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Making Food Modernity: Science and Technology in Late Soviet Nutrition and Food Production

Elena Kochetkova 

Department of History, HSE University, 123 Griboedova emb., Saint-Petersburg 190068, Russia
ekochetkova@hse.ru

From the mid-1950s, industrial food manufacturing has become a key priority of the Soviet economy. Increasing the production of agricultural and manufactured foodstuffs was a matter of improving living standards, which from 1961 the Soviet leadership declared as a crucial step in achieving the aims of communism. At the same time, since the 1950s and 1960s, the role of science and technology in making food products has significantly increased, promising improvements in both the quantity and quality of nutrition. Specialists played a key role in incorporating traditional foods into the complex nexus of modern science and technologies of production and they developed new qualities of food they called ‘modern’. Food modernity was based on the strong belief in the power of chemical elements, microbiology and modern technologies of production to make healthier, tastier and more sustainable food products. By the 1970s, hygiene also became a crucial element of production, incorporated into the system of labour incentives at Soviet enterprises. These attempts, however, co-existed with food shortages, infrastructural problems and a low production culture that became especially obvious by the 1980s. This paper demonstrates the controversy of Soviet industrial food-making: strong beliefs in food science as the trigger for increasing living standards co-existed with backward industrial infrastructures which left ‘modern food’ a matter of experiment rather than real production. This reveals a pivotal problem in the Soviet economy, where intensive research met insufficient infrastructures for implementation.

Introduction

In the early 1960s, the Soviet food-making industry began to produce fried potato chips, which, as a popular 1961 book put it, were a modern product made from basic foodstuffs.¹ Their domestic production was limited, however, and the consumption of potatoes, a traditional Russian food since the nineteenth century, had been generally decreasing. Almost three decades later, in January 1990, the first McDonald’s restaurant was opened in Moscow, drawing crowds of Soviet citizens to taste French fries and other food products of modernity.² Between these two events on the timeline of modified potato manufacturing, the Soviet Union invested in food science and undertook numerous attempts to make its own food products industrially, ranging from potato chips and triangle-packaged milk to smoked meat. Even so, these initiatives did not result in a domestic Soviet chain of modern food production, and the Soviet economy remained subject to shortages of consumer goods. From the late 1980s, the country’s leadership introduced market mechanisms and received flows of goods and investments from Western companies which manufactured various products, ranging from hamburgers to chocolate bars. Late Soviet history was, thus, the period that began with grand enthusiasm about the economic implications of science and chemistry and ended with the failure of the planned economy.

¹ D. D. Korolev and Evgeny Volkov, *Proizvodstvo zharenogo khrustyashchego kartofelya* (Moskva: Pishchepromizdat, 1961).

² George Ritzer, *The McDonaldization of Society: An Investigation into the Changing Character of Contemporary Social Life* (Thousand Oaks: Pine Forge Press, 1996).

Indeed, the mid-to late-1950s turned a new page in Soviet food-making, prioritising the mass industrial production of traditional foods, such as bread, and introducing new products like potato chips and melted cheese. Soviet food policy began pursuing a new goal to increase the living standards of Soviet people, to a large extent challenged by the growing consumer society in the United States and other Western countries.³ Nikita Khrushchev in particular used ‘industrial food’ as a measurement of success in his social policy and proof that Soviet state socialism was the most suitable model of societal and economic development. The food industry was thus the focus of Soviet attempts to build the society which would imply an expanded role for science in material life as a progressive achievement of socialism. Occupying a fairly significant place in the Soviet state socialist project in general, specialists – scientists and engineers – working in the planned economy took great effort to translate the beliefs in scientific and technological progress which flourished under Khrushchev into mechanisms for food experimentation and manufacturing, developing the notion of ‘modern’ (*sovremennaya*) food.⁴

Through the professional lens, food modernity would be achieved through science – chemistry and microbiology most of all – which was capable of producing not only voluminous but also diverse, sustainable and healthy food products at modern enterprises. Specialists envisaged that Soviet people should live better and have diversified, healthier and bacteria-free food available.⁵ Their professional beliefs in the potential of food science to change society in the mid-1950s and 1960s developed in the context of great Soviet achievements in outer space, chemistry and the peaceful atom, which together convinced many food scientists of the need to apply science to food. Food scientists from various institutions, such as the Scientific Research Institute of Nutrition, the All-Union Institutes of Meat Industry, Milk Industry and the Bread Making Industry, contributed to this aim. They experimented with various qualities of food products, insisting that science could make food available and more modern, serving to improve the diets and well-being of the people.

Focusing on the roles of industrial scientists and experts in explaining, experimenting and implementing food modernity, this article examines attempts to develop industrial food manufacturing in the Soviet Union between the 1950s and late 1980s.⁶ It aims to contribute to recent scholarship that examines the role of science and consumerism in Soviet society and that which considers the notion of socialist modernity, focusing on the material and cultural aspects of the Soviet food industry.⁷ Current scholarship emphasises a big role of science in the creation of the Soviet consumer society through new technologies at home, in clothing and trading, as well as various consumer practices, often placing them in the global context of the Cold War. Some scholars demonstrate how the home space, and kitchens in particular, came to be filled with modern products which changed citizens’ lives, as

³ With the beginning of the Cold War, American leaders chose manufacturing of mass products as the main method of competing for modernity with the communist bloc. See more on the ideology of mass consumption and modernisation theory as a tool of development in Nils Gilman, *Mandarins of the Future: Modernization Theory in Cold War America* (Baltimore: Johns Hopkins University Press, 2003).

⁴ See more on the meaning of science in the Soviet society and politics, in Slava Gerovitch, ‘“New Soviet Man” Inside Machine: Human Engineering, Spacecraft Design, and the Construction of Communism’, *Osiris*, 22, 1 (2007), 135–57; Elena Aronova, ‘Big Science and “Big Science Studies”, in the United States and the Soviet Union during the Cold War’, in Naomi Oreskes and John Krige, eds., *Science and Technology in the Global Cold War* (Cambridge, MA: MIT Press, 2014), 393–429; Egle Rindzeviciute, ‘A Struggle for the Soviet Future: The Birth of Scientific Forecasting in the Soviet Union’, *Slavic Review* 75, 1 (2016), 52–76, among others.

⁵ Barbara Severin, ‘The USSR: The Livestock Feed Issue’, in Josef C. Brada and Karl-Eugen Wadekin, eds., *Socialist Agriculture in Transition: Organizational Response to Failing Performance* (Boulder: Westview Press, 1988), 229.

⁶ See more on earlier Soviet modernity in Steven Kotkin, ‘Modern Times: The Soviet Union and the Interwar Conjuncture’, *Kritika*, 2, 1 (2001), 111–64. On the Cold War rivalry, see among others Sara Lorenzini, *Global Development: A Cold War History* (Princeton: Princeton University Press, 2019); Jeremy Friedman, *Shadow Cold War: The Sino-Soviet Competition for the Third World* (Chapel Hill: UNC Press Books, 2015); Evan While, ‘Kwame Nkrumah: Cold War Modernity, Pan-African Ideology and the Geopolitics of Development’, *Geopolitics*, 8, 2 (2003), 99–124.

⁷ Olga Smolyak, ‘DIY: A Few Thoughts about Comfort and Inventiveness of a Soviet Man in the 1960s’, *Ab Imperio*, 4 (2011), 236–59; Zinaida Vasilyeva, ‘Soobschestvo TRIZ: logika i etika sovetского izobretatel’ia’, *Etnograficheskoe obozrenie*, 3 (2012), 29–46; Alexey Golubev, *The Things of Life: Materiality in Late Soviet Russia* (Ithaca: Cornell University Press, 2020), among others.

they had in Western countries. Modern home appliances, ranging from juice makers to vacuum cleaners, became desired symbols of scientific and technological progress and the consumer society both in the West and East.⁸ Soviet specialists expressed belief in rationality and progress as two important priorities of social development, while the state often deployed the concepts in propaganda, for example, of people's creativity and inventiveness.⁹ Science thus constituted a Soviet vision of modernity and the consumer society.¹⁰ Food manufacturing also adopted Western practices and technologies, but it had its own specifics in view of the Soviet imperative to create a large-scale food industry based on national science and technologies.¹¹ This work further focuses on the role of science in socialist society with a particular focus on research and industrial production. Based on new published and archival sources such as scientific publications and enterprise reports, it argues that in the Soviet Union, where science had played a crucial role in building the socialist society, it was also important for attempting to build food modernity via industrial food manufacturing and nutrition of Soviet citizens.

This article demonstrates how professionals saw the role of food in the making of the modern socialist consumer. The modern Soviet citizen came to mean a busy person whose increased intellectual work and active leisure life would require the rationalised consumption of more minerals and vitamins. Natural food such as milk 'just from the cow' and homemade bread could not satisfy all of humans' nutritional needs, but science could 'improve' nutrition. The visions of this kind of improvement ranged from the enrichment of milk products, bread, meat and other foods with vitamins to synthetic production of food from oil. Through various additives, food science could make traditional food better tasting and more nutritious in terms of calories and vitamins. In addition, scientists insisted that food production itself should be made cleaner and hygiene became an important principle of labour in the food industry to produce bacteria-free food and decrease poisoning risks. Modern technologies of packaging, transportation and storage – such as freeze-drying, sterilising and cooling – could make food products more sustainable and increase their shelf life. Nutrition for Soviet people would thus become more progressive, i.e. science-based and carefully calculated. Diets, industrial production and science, thus, became intertwined during the second half of the century, resonating with the image of a modern and productive society.

⁸ Ruth Oldenziel, Adri Albert de la Bruhèze and Onno de Wit, 'Europe's Mediation Junction: Technology and Consumer Society in the 20th Century', *History and Technology*, 21, 1 (2005), 109; Ruth Oldenziel and Karen Zachmann, eds., *Cold War Kitchen: Americanization, Technology, and European Users* (Cambridge, MA: MIT Press, 2009); Susan E. Reid, 'The Khrushchev Kitchen: Domesticating the Scientific-Technological Revolution', *Journal of Contemporary History*, 40, 2 (2005), 289–316; Susan E. Reid, 'This is Tomorrow: Becoming a Consumer in the Soviet Sixties', in Anne Gorsuch and Diane Koenker, eds., *The Socialist Sixties: Crossing Borders in the Second World* (Bloomington: Indiana University Press, 2013), 25–65, among others.

⁹ See, for example, Tatiana Voronina, 'From Soviet Cuisine to Kremlin Diet: Changes in Consumption and Lifestyle in Twentieth-Century Russia', in Derek Oddy and Peter Atkins, eds., *The Rise of Obesity in Europe* (New York: Routledge, 2009); Olga Gurova, *Fashion and the Consumer Revolution in Contemporary Russia* (New York: Routledge, 2015); Susan E. Reid, 'Everyday Aesthetics in the Khrushchev-Era Standard Apartment', *Etnofoor*, 24, 2 (2013), 79–106; Aaron Hale-Dorrell, 'Industrial Farming, Industrial Food: Transnational Influences on Soviet Convenience Food in the Khrushchev Era', *The Soviet and Post-Soviet Review*, 42, 2 (2015), 174–96; Adrienne Jacobs, *The Many Flavors of Socialism: Modernity and Tradition in Late Soviet Food Culture, 1965–1985* (Chapel Hill: UNC Press Books, 2015); Sergey Bakanov and Aleksandr Fokin, "'And Under Communism Everything Will Be...': How the Planning Agencies of the USSR Saw the Nation's Wealth by 1980", *Modern History of Russia*, 9, 2 (2019), 420–36; Anastasia Lakhtikova, Angela Brintlinger and Irina Glushchenko, eds., *Seasoned Socialism: Gender and Food in Late Soviet Everyday Life* (Bloomington: Indiana University Press, 2019); Albena Shkodrova, Yves Segers and Peter Scholliers, eds., *Food and History: Food and Drink in Communist Europe*, 18, 1–2 (2020) and others.

¹⁰ See Elena Kochetkova, 'Milk and Milk Packaging in the Soviet Union: Technologies of Production and Consumption, 1950s–70s', *Russian History*, 46, 1 (2019), 29–52. See on socialist modernity: Johann Arnason, 'Communism and Modernity', *Daedalus*, 129, 1 (2000), 61–90; Michael David-Fox, *Crossing Borders: Modernity, Ideology, and Culture in Russia and the Soviet Union* (Pittsburgh: University of Pittsburgh Press, 2015).

¹¹ See, among others, Jenny Smith, 'Empire of Ice Cream: How Life Became Sweeter in the Postwar Soviet Union', in Warren Belasco and Roger Horowitz, eds., *Food Chains: From Farmyard to Shopping Cart* (Philadelphia: University of Pennsylvania Press, 2009), 14–57.

Growing infrastructural problems of the planned economy, however, hindered the translation of the notion of ‘modern food’ from dream and experiment to the industrial reality. With the increasing food shortages and economic stagnation, overall scientific enthusiasm around food was degrading. Attempts to undertake scientific experimentation in industrial food-making co-existed with persistently low food supplies, while attempts to make conditions of production at food enterprises more hygienic were faced with routine neglect of health standards, with enterprises often not following basic sanitary norms. Backward industrial infrastructures also challenged the implementation of many of the envisaged experiments, revealing a gap between the world of research and actual industrial production under Soviet state socialism. Importantly, while the state supported the rhetoric about the significance of modern food to increase living standards and ‘beat the West’, its investments into real infrastructures in the state economy remained low, showing the contradictory nature of Soviet social and industrial policy. The article argues that food modernity as a professional vision of food-making clashed with the realities of infrastructural backwardness, showing the Soviet Union as a space of tension between the scientific dreamscapes and industrial infrastructures.

This paper opens with a brief overview of late Soviet nutrition to demonstrate how scientists saw it as inefficient and requiring improvement by increasing the amounts of ‘enriched’ food in consumption. Then it discusses professional visions of modern food and the roles of food safety and hygiene as part of modern food production and consumption.

Late Soviet Nutrition

Filled with controversy, the late Soviet food economy was characterised by political attempts to feed citizens, shortages of food products and increased scientific engagement with nutrition policy in the Soviet Union. Beginning with Khrushchev’s rule, Soviet leaders aimed to eliminate large-scale famines which had had calamitous effects in previous epochs.¹² First, this was to be done by importing grain and other food products, which in fact became an unprecedented decision of political power since Stalin, who did not allow foreign aid despite food shortages. Post-Stalinist politicians stressed how important food-making was for Soviet society. Food campaigns featured prominently in Khrushchev’s policies, when the drive to catch up with the West led to some collective farms (*kol-khozes*) overfulfilling at production plans.¹³ Second, unlike in the previous era, establishing a ‘powerful food making industry’ within the Soviet Union became important even though not sufficient in reality.¹⁴ In the context of increasing urbanisation due to migration from the countryside and the establishment of new cities, the development of food-making at an industrial scale was a pivotal issue.

By the 1960s, in general, Soviet society had solved the problem of famines and became a society which aimed to consume.¹⁵ At that time, the Soviet food-making industry included thirty sectors, such as the butter, meat and vegetables industries. There were over 22,000 industrial food-making enterprises, including 900 fish-harvesting facilities, about 10,000 dairy and meat plants and over 10,000 bread producers, altogether employing three million people. By 1975, the food industry made up 20 per cent of total industrial output, occupying the second place in the economy after the machinery and metallurgic industry.¹⁶ The overall weight of the food-making industry, however,

¹² See, for example, Niccolo Pianciola, ‘The Collectivization Famine in Kazakhstan, 1931–1933’, *Harvard Ukrainian Studies*, 25, 3–4 (2001), 237–51; Michael Ellman, ‘The Role of Leadership Perceptions and of Intent in the Soviet Famine of 1931–1934’, *Europe-Asia Studies*, 57, 6 (2005), 823–41; and others.

¹³ See more in Yoram Gorlizki and Oleg Khlevniuk, *Substate Dictatorship: Networks, Loyalty, and Institutional Change in the Soviet Union* (New Haven: Yale University Press, 2020).

¹⁴ Ivan Sivolap and Abram Shatkhan, *Pishchevaya promyshlennost’ SSSR* (Moskva: Gospolitizdat, 1957), 10. The last large-scale famine in the Soviet Union was under Stalin right after the Second World War. In the early 1960s, Nikita Khrushchev became the first Soviet leader to purchase grain from abroad to prevent further famine due to poor harvests.

¹⁵ Alexis Berelowitch, ‘Semidesyatye gody XX veka: replika v diskussii’, *Monitoring obshchestvennogo mneniya*, 4 (2003), 64.

¹⁶ I. Logosov, ‘Promyshlennost’’, *Bol’shaya sovetskaya entsiklopediya*. Available at <https://www.booksite.ru/fulltext/1/001/008/106/985.htm> (accessed 5 Sept. 2022).

was still markedly lower than heavy industry. By 1970, the share of the food-making industry as measured in enterprise prices was 18.9 per cent from the whole industrial production; in 1975 it was 17.6 per cent and in 1985 it made up 15.2 per cent. By comparison, heavy industry made up 60 per cent in 1970, 63.7 per cent in 1975 and 68.6 per cent in 1985, while light industry constituted 18.8 per cent in 1970, 16.8 per cent in 1975 and 14.6 per cent in 1985.¹⁷

The scarce supply of food products remained a real problem. In the 1960s in particular, it was not possible to purchase meat in shops in most cities of the country, while it was available at cooperatives and *kolkhozes* at higher prices.¹⁸ Central large cities were an exception as the state authorities prescribed to supply enterprises in Moscow and Leningrad with fat beef cattle and pigs. Better supplies of large cities gave birth to the phenomenon of ‘sausage trains (*kolbasnye poezda*)’, when citizens from outlying regions travelled to urban centres to purchase shortage foods.¹⁹

Against the backdrop of these shortages, the quality of food and its nutritional value became an important focus of both state policy and professional research. In 1962, improving the quality of industrially-made products was confirmed as an imperative when a high-level decree imposed responsibility for bad production on enterprises themselves.²⁰ Quality was now increasingly connected to nutritional value and usefulness and the quality of raw materials was seen as important because, as some specialists put it, ‘a product of good quality could be made from high-quality raw materials only’.²¹ In addition, along with Khrushchev’s campaign of ‘catching up with the United States in the volumes of production of meat, milk and butter in three years’, these basic food products were to be made more nutritious and safer for consumption – in other words, it was important to modernise them and satisfy the nutrition demands of modern labourers.

One of the key institutions to study nutrition was the All-Union Institute of Nutrition established as early as 1930 for investigating and calculating what products Soviet people should consume. From the 1960s especially, it was focused on researching the impacts of different elements found in food on human health and work ability. Under the supervision of the academician Aleksey Pokrovsky from 1961 onward, the Institute of Nutrition developed research, particularly around balanced nutrition and the absorption of food elements by the human organism. Health issues now became crucial and were connected to diseases like diabetes which, unlike previously, was conceptualised as a modern health problem requiring special care and diet. Some institutions, such as the All-Union organisation ‘Moloko’ (meaning ‘milk’) that opened in 1962 in Moscow, especially propagated the importance of balanced nutrition and vitamin consumption to the population at exhibitions and special lectures and seminars.²²

Looking at food through the lens of modernity, Soviet specialists working at scientific institutions and industry insisted that just increasing food volumes was not enough and argued that new values should emerge around food. They emphasised its role beyond just satisfying calorie demands. Scientists complained that despite the increased attention to the production of food, real supplies did not improve and nutritional requirements were not satisfied. As the Institute of Nutrition of the Soviet Union had calculated, the annual production of milk per head was below the calculated norm: in 1974, Soviet farms produced 300 kg of milk per head while 460 kg were

¹⁷ *Promyshlennost’ SSSR: statisticheskii sbornik* (Moskva: Goskomitet SSSR, 1988), 11.

¹⁸ Viktor Tomilin, ‘Struktura pitaniya osnovnykh kategorii gorodskogo i sel’skogo naseleniya SSSR v period politicheskogo liderstva N.S. Khrushcheva’, *Gumanitarnye issledovaniya Tsentral’noi Rossii*, 1, 1 (2016), 43–53.

¹⁹ Sovet narodnogo khozyaistva Leningradskogo ekonomicheskogo administrativnogo rayona. *Perepiska s Gosplanom RSFSR*, 1959 g.// The Central State Archive of St. Petersburg (TsGA SPb). F. R-9683. Op. 1. D. 396. L.41. On ‘sausage trains’ see Nataliya Leбина, *Passazhiry kolbasnogo poezda* (Moscow: Novoe literaturnoe obozrenie, 2019).

²⁰ Postanovlenie Soveta Ministrov SSSR ot 13 iyulya 1962 goda ‘Ob uluchshenii organizatsii tekhnicheskogo kontrolya za kachestvom produktssii’. Available at http://www.libussr.ru/doc_ussr/ussr_5858.htm (accessed 5 Sept. 2022).

²¹ Zinaida Matyukhina, El’vira Korol’kova and Svetlana Ashcheulova, *Pishchevye produkty (tovarovedenie)* (Moskva: Ekonomika, 1982), 24.

²² Nikolai Antonov, *Opyt moskovskogo proizvodstvennogo ob’edineniya ‘Moloko’ po povysheniyu kachestva produktssii i effektivnosti proizvodstva* (Moskva: TsNIITEImyasomolprom, 1978), 3.

required.²³ According to the norms developed by the Institute of Nutrition, a person's recommended daily intake was 0.5 kg of milk, kefir or sour milk, 0.2 kg of butter and 0.2 kg of sour cr me (*smetana*).²⁴ The official Soviet statistics said that the amounts of milk and meat consumed were going up. Thus, between 1960 and 1985, the consumption of bread decreased from 164 kg to 133 kg per head, potatoes from 143 kg to 104 kg, while the consumption of milk increased from 240 kg to 325 kg and meat from 39.5 kg to almost 63 kg.²⁵ The comparison of 1940 and 1985 appears even more radical: in 1940, Soviet enterprises produced 1.5 thousand tons of meat; in 1985 more than 10.8 thousand tons were manufactured industrially.²⁶ Similarly, in 1940, the state purchased 6.5 thousand tons of milk from *kolkhozes* and other producers; in 1985 this had increased tenfold.²⁷ This change was the result of positive development and better investments in animal farming and the general improvement of living standards compared to previous decades. At the same time, if we are to believe Western analytics, from 1965 to 1981, Soviet food energy value did not radically differ, varying from 3060 to 3250 calories per capita per day with most of the changes between 1965 and 1975 when the rate of calories rose most significantly. Overall, these rates were similar to American ones, but the latter had higher fat supply in food.²⁸ The composition of nutrition was also different: in the Soviet Union in 1965 and 1981 alike, most calories were derived from grain products and potatoes (57 per cent and 47 per cent respectively) while in the United States in the same years sources of nutrition were more varied: grains and potatoes (23 per cent in both years); meat and fish (a sustained 21 per cent); oils and fats (17 per cent in 1965 and 18 per cent in 1981), among others. Meat and fish consumption increased by just 2 per cent over this sixteen-year period in the Soviet Union (from 8 per cent to 10 per cent), while the consumption of dairy and eggs increased by 3 per cent (from 8 per cent to 11 per cent).²⁹ During the whole period, the Soviet ration was, thus, satisfactory from the perspective of calorie nutrition but much less diversified than in the United States, which the Soviet political establishment routinely characterised as the rival whose standards it aimed to beat. This was the point that specialists often critically referred to: food consumption should be not only sufficient in quantity but also diversified and enriched; it should be produced and stored with the use of modern technologies to preserve its best qualities.

Food had to correspond to the needs of modern workers in vitamins and minerals and help them be strong enough to resist infections and stay healthy. The notion of the modern worker derived from the belief that unlike previously, labour now required more intellectual efforts. The pace of urban life was also becoming more active. Nutrition policy was particularly connected with labour productivity which, in turn, referred to fostering a more economically competitive society. Thus, specialists I. Sivolap and A. Shatkhan, who both worked in the food-making industry, argued in their 1957 book that the food industry was crucial for reproducing the 'primary motor' of society, labour.³⁰ At the same time, the possibilities of chemical technologies explored after the war could increase scientific intervention into food-making. Beginning in the Khrushchev period, many scientists saw the chemicalisation of food as a positive trend in the life of modern people, connecting food production to time-consuming practices. Cooked food gained new meanings connected to technological possibilities. It should be not only healthy and enriched with vitamins and minerals but also quick to prepare: a 'housewife was to think about the diversity of dishes which were not to be time-consuming, especially

²³ Elena Zinochkina, *Opyt priema moloka neposredstvenno v kolkhozakh i sovkhozakh* (Moskva: TsNIITEIMinzaga SSSR, 1974), 1. Soviet statistical reports calculated amounts of liquid products in kilograms.

²⁴ Matyukhina, Korol'kova and Ashcheulova, *Pishchevye produkty*, 153.

²⁵ Adrienne Jacobs, *The Many Flavors of Socialism*, 40.

²⁶ *Narodnoe khoziaistvo v 1985 godu* (Moskva: Finansy i statistika, 1986), 255.

²⁷ *Ibid.*, 246.

²⁸ Ann Lane, Ruth Marston and Susan Welsh, 'The Nutrient Content of the Soviet Food Supply and Comparison with the U.S. Food Supply', in *Gorbachev's Economic Plans: Study Papers*, Vol. 2 (Washington, DC: US Government Printing Office, 1987), 81, 84, 90.

²⁹ *Ibid.*, 92.

³⁰ Sivolap and Shatkhan, *Pishchevaya promyshlennost'*, 1.

for breakfast when every minute is valuable to feed everyone who is leaving for work'.³¹ Food was thus connected to time saving: it was to be nutritious but quick to prepare, freeing both men and women from excessive cooking through scientific solutions.³² Overall, science could participate in food-making and 'improve' its qualities to facilitate the modern society. In the context of increased state support of science, research institutions intensively investigated the possibility of chemistry and microbiology to bring together food-making and scientific achievements.

Science and Industrial Food-Making

Scientific enthusiasm about industrial food-making among Soviet specialists resonated with a growing optimism in food science in the West. In many Western countries, chemistry and microbiology played an important role in food manufacturing as early as the late nineteenth century.³³ In particular, science aimed to control the purity of milk and its fat content, making milk a hybrid of nature and society. At the onset of the Cold War, due to the advancement of chemistry-related disciplines, the scientific dimensions of food production became even more pronounced in the developed economies. Thus, for example, the grading of milk quality depended directly on its sterilisation rather than its fat content, as previously.³⁴ In Western countries during the Cold War, many scientists saw food production as a central driver of societal development and through technological advances it held the promise of improving comfort, health and productivity. One of the most famous examples of technology seen as progressive was the pesticide DDT, widely applied in agriculture and at home.³⁵ Freezing food, producing bacteria-free products, and dried food technologies changed the possibilities around transporting and delivering food.³⁶ By the 1950s and 1960s, Western food industries extensively used chemical additives and antibiotics that became incorporated into basic food standards.³⁷

In many ways, Soviet scientists similarly saw the positive effects of food science and technologies in the food-making industry, attributing chemicals the power of improvement of natural food.³⁸ At the same time, in the Soviet Union, making modern food was also ideologically embedded and closely connected with the aim of achieving communism. For example, as Jenny Smith demonstrates, post-war Soviet ice cream became a modernist product because it was produced by mechanised machinery and promised to bring a happy life to Soviet citizens.³⁹ This demonstrated that bringing together scientific and technological achievements in the quest for joy from life under socialism was a crucial element of industrial food-making in the Soviet Union. In the Soviet Union, the volumes of

³¹ *Kniga o vkusnoi i poleznoi pishche* (Moskva: Pishchepromizdat, 1952), 25.

³² For more on emancipation in the Soviet Union, see Anna Lakhtikova, 'Emancipation and Domesticity: Decoding Personal Manuscript Cookbook from the Soviet Union', *Gastronomica*, 17, 4 (2017), 111–26.

³³ Abigail Woods, 'Science, Disease and Dairy Production in Britain, 1927–80', *Agricultural History Review*, 62, 2 (2014), 294–314.

³⁴ Peter Atkins, *Liquid Materialities: A History of Milk, Science and the Law* (Farnham: Ashgate, 2010), 257.

³⁵ David Kinkela, *DDT and the American Century: Global Health, Environmental Politics, and the Pesticide that Changed the World* (Chapel Hill: UNC Press Books, 2011). See also American commercials of DDT in 'Let's Put It Everywhere', 1946. Available at https://www.youtube.com/watch?v=-UiCSvQvVys&t=5s&ab_channel=markdcatin (accessed 5 Sept. 2022). Frank Uekötter, 'Why Panaceas Work: Recasting Science, Knowledge, and Fertilizer Interests in German Agriculture', *Agricultural History*, 88, 1 (2014), 68–86.

³⁶ Food has always been a tool for political manipulation. One might recall the 2014 food sanctions and anti-sanctions campaign between the West and Russia. See Anton Masterovoy, 'What Was Socialist Food and What Comes Next?', *Contemporary European History*, 26, 3 (2017), 523–32. This also brings to mind the famous Kitchen Debate. See more in Ruth Oldenziel and Karen Zachmann, eds., *Cold War Kitchen* (Boston, MA: MIT Press, 2008).

³⁷ Kendra Smith-Howard, *Pure and Modern Milk: An Environmental History since 1900* (New York: Oxford University Press, 2013), 121.

³⁸ See an analysis of the post-1953 Soviet city and welfare in Mark Smith, 'Faded Red Paradise: Welfare and the Soviet City after 1953', *Contemporary European History*, 24, 4 (2015), 597–615. In the 1960s the world food problem brought to the fore the importance of food as a political instrument in the United States. See Nick Cullather, *The Hungry World: America's Cold War Battle Against Poverty in Asia* (Cambridge, MA: Harvard University Press, 2010).

³⁹ Smith, 'Empire of Ice Cream', 156.

manufactured chemical products grew rapidly in the 1950s and 1960s, advancing it ahead of many countries in the West. One Soviet report claimed that the volumes of different chemical production, widely applied from agriculture to food manufacturing, were 1.5 times higher in the Soviet Union than in ‘the developed countries’, namely the United States, the United Kingdom, France and West Germany.⁴⁰ The Soviet drive to introduce advances in chemistry to food-making continued in the 1960s and 1970s. Scientists admired chemicals: academician N. Zhuravlev, for example, insisted that chemicals and fertilisers were crucial for sustainable food-making. ‘The human possesses now the knowledge and technology that, if they are not used in the military aims, will open grandiose perspectives behind us’, he declared, adding that ‘one of the most precious aims [of science] is to provide each human with adequate nutrition’.⁴¹ Other commentators on Soviet science and technology put it similarly: ‘the revolutionary (*revolyutsioniziruyushchaya*) role of chemistry and the chemical industry means that chemistry provides a basis for the wide chemicalisation of the economy and, as a result, we can significantly increase the production of material wealth (*material'nykh blag*) by minimal material and labour costs’. It emphasised not simply statistical criteria – that is, the increase of output – but also a higher quality of products. This was especially the case in the making of synthetic materials to replace traditional and natural ones.⁴² Chemistry was to change the traditional meaning of food, which in its natural form was held to be insufficient for replenishing vitamins and minerals in the human body. Instead, food would be more useful because of added chemical elements and healthier because of antiseptic methods. It was also seen as ‘a source of increasing the volumes of consumer goods’.⁴³

More precisely, modern food implied a range of new qualities: it was to be more sustainable, not easily spoiled, be valuable for health due to its calorie and vitamin content, be quick to prepare, be tasty and appetising through additives and beautiful packaging. New technologies in food-making, storing and transporting, like freeze-drying, vitaminisation and new packaging, were to deliver these new features of food. It would solve the ‘old’ problems such as the food scarcity that arose from bad harvests, improper storing and transporting and would also compensate for the lack of vitamins and minerals required by modern people. Thus, in 1965, Aleksandr Nesmeyanov and Vasily Belikov published an article claiming that soon ‘food production will be a matter of chemistry’.⁴⁴ Nesmeyanov, the distinguished Soviet chemist who served as the head of the Soviet Academy of Sciences between 1951 and 1961, was a strong supporter of the synthetic manufacture of food. He invited talented chemist Belikov to head the Laboratory for the Synthesis of Food Fibers opened at the Academy of Sciences in 1961 and to conduct research on the making of synthetic food. About two decades later they co-authored a popular book about chemistry and food. It particularly stated that ‘chemistry treats, washes, dresses and shoes [us]. Chemistry helps provide agriculture with fertilizers. It will begin to feed us too’ and will also liberate us from surplus labour.⁴⁵ The book invited its readers to imagine the future when chemistry would have become very advanced and food-making would become entirely industrially produced. They wrote: ‘the country will be fed by a few dozen huge enterprises located in oil-rich regions (for making ferments) and coal (for distillation products)’. They then stated: ‘let’s think what we will win from that’. The first benefit would be improved food safety because there would no longer be problems with harvests and there would be no need to build storage and protect food from pests. Secondly, food would be much more hygienic because synthetic food could be easily stored. The third benefit would be higher nutritional value which could be easily controlled and through vitaminisation and mineralisation could fit human needs to avoid health problems related to obesity and disease. Fourth, the synthetic turn would signal a moral victory, as

⁴⁰ 50 let. *Sovetskaya khimicheskaya nauka i promyshlennost'* (Moskva: Izd-vo 'Khimiya', 1967), 29.

⁴¹ N. M. Zhavoronkov, ‘Khatit li cheloveku prodovol'stvennykh resursov? Chto potrebuetsya ot khimii dlya obespechneniya Zemli prodovol'stvem?’, *Nauka i zhizn'*, 5 (1965), 9.

⁴² 50 let, 55.

⁴³ *Ibid.*, 44.

⁴⁴ Aleksandr Nesmeyanov and Vasily Belikov, ‘Pishcha, kakoi my ee vidim v budushchem’, *Khimiya i zhizn'*, 7–8 (1965), 9.

⁴⁵ Aleksandr Nesmeyanov and Vasily Belikov, *Pishcha budushchego* (Moskva: Pedagogika, 1985), 11, 81.

there would no longer be any need to kill animals when synthetic food could be grown instead.⁴⁶ Finally, there was the promise of economic benefit, as it would free millions of workers and increase the number of people involved in services. Their dream echoed that espoused by scientists and politicians not only in the Soviet Union but in other countries. American scientists believed, for instance, that science could make the world better and solve the problem of feeding society.⁴⁷

The development of research into diseases also brought new meanings to food qualities. In particular, many spoke about the need to make diabetic food products available.⁴⁸ Additives were used for making food more attractive, for example, using ultramarine to whiten the yellow colour of sugar – ‘we perceive a white colour as ideally pure and yellow as old’.⁴⁹ Soviet scientists also developed methods of adding vitamins A and C to melted cheese, which was one of the most popular dairy products in the late Soviet Union.⁵⁰ The motivation for this research was in part the belief that natural food products simply did not fully satisfy the nutritional needs of modern people. Scientists calculated that cow’s milk, for instance, did not contain sufficient amounts of amino acids, and chemistry in this instance played a useful role in enhancing food’s value. Beyond natural elements and microorganisms, artificial elements were to be added to make food more nutritious for consumers in terms of vitamin and mineral content. In the 1970s, the Institute of Nutrition thus recommended that each citizen should consume between 80 to 100 grams of vitaminised butter per day to reduce risks of heart disease, prevent excessive weight gain and the emergence of other health problems.⁵¹ The increased value of food products was particularly obvious and well propagated in the case of milk when, for example, children’s storytellers and poets described how effective it was for children’s health and concluded that milk was a powerful drink needed for consumers of all ages.⁵²

Scientists argued that ascorbic acid, niacin, vitamins of groups B, C, A and E, cholin and thiamin were crucial to consume and also aided in making food products look more appetising. Applying protein emulsions helped keep products like mayonnaise and children’s food fresh for longer. The Institute of Nutrition particularly examined new qualities of sublimated food products. As scientists L. Bachurskaya and V. Gulyaev explained, food concentrates required minimal labour costs, were quick to prepare, saved time and also contained more nutritional elements, more calories and could be more easily digested. They also occupied less space for storing and transporting.⁵³ One of the examples of Soviet fast food was sublimated mashed potatoes (*sukhoe pyure*): ‘you tear the package, put the puree into the pan and mix it with water. You should not worry if there is milk in your fridge [to make mash from potatoes yourself]’.⁵⁴ Ideologically, these new qualities, ranging from usefulness to time saving, were considered crucial for making people’s lives easier by enhancing scientific-technical progress in all spheres of life.⁵⁵ Nutritional value was further connected to decreasing disease in order to increase ‘potential labour resources of the country’ and to reduce economic losses due to malnutrition. As V. Poznyakovsky and others wrote, enrichment of food with vitamins was important to prevent vitamin deficiency.⁵⁶

⁴⁶ Ibid., 124–5.

⁴⁷ Kinkela, *DDT and the American Century*, 34, 129.

⁴⁸ Envar Tokaev and Iosif Rogov, *Proizvodstvo produktov povyshennoi pishchevoi tsennosti s ispol'zovaniem emul'sii* (Moskva: AgroNIITEIMMP, 1988), 1.

⁴⁹ Nesmeyanov and Belikov, *Pishcha budushchego*, 79.

⁵⁰ Solomon Barkan and Mariya Kuleshova, *Plavlennyye syry* (Moskva: Izdatel'stvo 'Pishchevaya promyshlennost', 1967).

⁵¹ A. Sergeev, ed., *Rukovodstvo po tekhnologii polucheniya i pererabotki rastitel'nykh masel i zhirov*, vol. 3 (Leningrad, 1977), 6.

⁵² This belief resonated with the practice of distributing milk at schools in other countries, in particular, in the United Kingdom. See more in Peter Atkins, ‘Fattening Children or Fattening Farmers? School Milk in Britain, 1921–1941’, *The Economic History Review*, 58, 1 (2005), 57–78.

⁵³ Lyudmila Bachurskaya and Valentin Gulyaev, *Pishchevye kontsentraty* (Moskva: Pishchevaya promyshlennost', 1976), 7–8.

⁵⁴ O. Ol'gin, ‘Kartoshka s molokom’, *Khimiya i zhizn'*, 10 (1982), 20.

⁵⁵ A. S. Emel'yanov, ed., *Planovoe upravlenie ekonomiko razvitogo sotsializma v 5 tomakh*, vol. 3 (Kiev: Naukova Dumka, 1986).

⁵⁶ Ibid.

Despite active research on food enrichment and sustainability, the Soviet industry supplied enriched food for large cities only, while most of the country suffered from industrially-made food of bad quality. In 1965, the Soviet economy doubled the production of vitamins compared to 1958 and continued increasing it, but the assortment was not large enough some scientists complained. Also, urban consumers who depended on a centralised supply often were not satisfied with new types of food, complaining about the taste and quality of bread and milk in particular. They complained about spoiled bread, misshapen loafs, rotten fruit and vegetables and milk products which were stored in warm conditions at shops and storage houses, i.e. spoiled because of improper infrastructures, such as the lack of or technically inefficient refrigerators.⁵⁷ As some stressed, much of the blame for the poor quality of food in city shops derived from abuses of technologies during transportation and at shops themselves, where shopkeepers diluted milk and sour cream with water and sold old bread.⁵⁸ Complaints targeted not only the production sites but also shops and canteens, stressing, for example, the low quality of milk offered there. Thus, Yu. Tsygulyev, vice head of the All-Union Science and Technology Society, reported about his business travel to Kharkiv in Ukraine that he found low quality milk at city canteens, but at the same time he saw that a local milk factory produced milk of high quality. He concluded that the problem of bad milk quality lay in improper transportation and storage rather than in industrial production itself.⁵⁹ This revealed not only a problem in food supplies as such, but also a gap between research laboratories and the final urban consumer: the results of far-reaching scientific experiments were not often available and satisfactory for the Soviet urban citizen because of ignoring proper infrastructural conditions. This exposed problems in implementing aspirations about food modernity and particularly put to the test the problem of hygiene during food production and storing.

Food Safety and Competing for Industrial Hygiene

Hygiene was a category which profoundly influenced the imagination about what food should be and was connected with industrial food safety. From specialists' perspectives, food hygiene entailed practices to protect public health and minimise biological food hazards through clean and safe industrial operations and storage, meaning that science should actively participate in industrial production and at shops. The problem of food hygiene, however, was not just a post-war concern but had been very important in Russia since the October Revolution, when hygienic norms became a crucial issue and when the state took control of citizens' daily regimes to decrease losses due to mass diseases.⁶⁰ In 1932, the Institute of Nutrition, Hygiene and Diet was founded at the Leningrad Research Institute of Nutrition. Nutritional hygiene and food toxicology were rapidly developing as fields of research at the Institute in later decades.⁶¹ Post-war Soviet hygiene discourse was connected to post-revolutionary campaigns to cultivate healthier bodies. In particular, it was connected to increasing the purity of the water supply and improving the quality of food in the cities and workers' settlements (*rabochie poselki*). Under Stalin, for example, the leadership aimed to solve the problem of urban sewage, which was a major cause of mass disease. Propagating cleanliness at workplaces was also emphasised, as well as teaching workers to change their clothes frequently, clean their houses and not smoke on the factory floor.⁶²

⁵⁷ Otchet i informatsiya o rabote komiteta narodnogo kontrolya za 1969 god. Vyborgskii gorodskoi komitet narodnogo kontrolya Leningradskoi oblasti // Leningrad Regional State Archive in Vyborg (LOGAV). F. R-4413. Op. 1. D.52. L. 11.

⁵⁸ Elena Tverdyukova, 'Khlebopechenie v SSSR v 1960-e–1980-e gg.', *Voprosy istorii*, 1 (2017), 42–54.

⁵⁹ Yi. M. Tsygulev, Protokol postanovleniya i stenogramma plenuma NTO trgovli 5 oktyabrya 1979 goda // State Archive of the Russian Federation (GARF). F. 5587. Op. 37. D. 216. L. 143.

⁶⁰ Tricia Starks, *Body Soviet: Propaganda, Hygiene, and the Revolutionary State* (Madison: University of Wisconsin Press, 2008); Donald Filtzer, *The Hazards of Urban Life in Late Stalinist Russia: Health, Hygiene, and Living Standards, 1943–1953* (Cambridge: Cambridge University Press, 2010).

⁶¹ A. A. Pokrovskii and A. I. Shtenberga, eds., *Metody opredeleniya pestitsidov v pishchevykh produktakh* (Moskva: Meditsina, 1965); I. M. Neiman *Kantserogeny i pishchevye produkty* (Moskva: Meditsina, 1972) and others.

⁶² See, for example, *Pravila tekhniki bezopasnosti i proizvodstvennoi sanitarii v vinodel'cheskoi promyshlennosti* (Yalta: VNIIV 'Magarach', 1985).

After the Second World War, the desire for more hygienic and safer products became a global trend through the development of more sophisticated technologies for sanitising, freezing and transporting perishable products. The purity of milk and other products was now increasingly connected to health and productivity as well as future generations, because, as one commentator said, ‘the purity of milk defines the health of the population, especially children’.⁶³ In the United States in particular, scientists contributed to the commercialisation of food irradiation in order to solve the problem of diseases resulting from the eating of food contaminated with bacteria and microbes.⁶⁴ Hygiene, as a product of science and technology, was part and parcel of post-war modernity, emphasised as a human achievement to purify food from harmful organisms.⁶⁵

Beginning in the 1960s, scientists insisted that Soviet industrial enterprises should integrate hygiene into the industrial system, making it one of a range of incentives for labour productivity. Hygiene therefore became not simply a matter of scientific research but also part of socialist labour, incorporated into the typical Soviet socialist production methods, such as socialist competition. In a decree issued by the milk factory located in Vyborg near the Soviet-Finnish border, the director insisted that ‘the quality of milk products depends directly on the hygienic conditions in the industry and particularly on the hygiene culture (*sanitarnaya kul'tura*) of all the factory workers’.⁶⁶ Hygienic qualities entailed pure, non-bacterial and literally useful food products produced in clean conditions to make food which would satisfy the cultured consumer. This resonated with the widespread phenomenon of *kul'turnost'*, in particular cultured trade and service (*kul'turnaya torgovlya*) in the Soviet Union from the mid-1950s, which implied that socialist service was to be more consumer oriented.⁶⁷ The manufacturing of ‘pure’ food such as milk became a component of propaganda campaigns and visual materials that insisted on the importance of progressive knowledge at sites of production. Enterprises propagated among workers the importance of technical learning, using such slogans as ‘Learn more intensively animal technical knowledge and advanced methods for feeding and taking care of cows!’⁶⁸

For specialists, being progressive meant applying modern technologies to increase output, productivity and hygiene level at enterprises. By the mid-1960s, hygiene as an imperative to achieve through the use of modern chemicals became a necessary component which connected food products with health and safety. In 1968, some *kolkhozes* began to hold competitions for ‘the farm of high animal-hygiene culture’ (*ferma vysokoi kul'tury*) which implied that workers should keep farms, production and themselves clean. It thus embedded hygiene into competitiveness, describing it as a matter of technological progress.⁶⁹ Separate enterprises included hygiene in their competition plans, such as the Krasnograd meat processing factory, which in the mid-1970s worked out a particular socialist obligation to improve hygiene conditions and production culture. At the end of every month, workers in the factory shops who achieved the best hygiene level at their workplace received rewards such as

⁶³ Informatsiya mskh souznykh respublik i veterinarnykh organov o vypolnenii vetsanpravil dlya molochnykh ferm kolkhozov i sovkhozov // The Russian State Archive of Economics (RGAE). F. 7486. Op. 40. D. 3660. L. 13.

⁶⁴ See more in Paul Josephson, *Red Atom: Russia's Nuclear Power Program from Stalin to Today* (New York: W. H. Freeman, 1999). Simultaneously, there was a concern with radioactive contamination which emerged as part of broader criticism against nuclear technology espoused by national nuclear policies in Western countries beginning in the late 1950s. In the Soviet Union, there was no popular protest against the Soviet nuclear policy. Instead, food scientists worried about the consequences of potential nuclear or chemical attack by the capitalist enemy. Smith-Howard, *Pure and Modern Milk*, 128.

⁶⁵ P. V. Kugenev, ed., *Zhivotnovodstvo i veterinariya*, vol. 6: voprosy kachestva moloka (Moskva, 1972), 95.

⁶⁶ Prikaz po Vyborgskomu gorodskomu molochnomu zavodu // Archival Department of the Administration of Vyborg Municipal Region. F. 67. Op. 1. D. 170. L. 152.

⁶⁷ See more on the phenomenon of cultured trade in Julie Hessler, ‘Cultured Trade: The Stalinist Turn Toward Consumerism’, in Sheila Fitzpatrick, ed., *Stalinism: New Directions* (London: Routledge, 2000), 182–209.

⁶⁸ G. Khvorov, *Kommunisty na ferme. Kommunisty v bor'be za vysokie nadoi moloka* (Barnaul: Altaiskoe knizhnoe izdatel'stvo, 1956), 15.

⁶⁹ Elena Zinochkina, *Opyt priema moloka neposredstvenno v kolkhozakh i sovkhozakh* (Moskva: TsNIIETMinzaga SSSR, 1974), 30.

money and trophies for top achievements and souvenirs depicting a chili pepper and broom with the message: 'I will not leave my workplace unless I have cleaned it up'. In addition, photos of the managers of the best shops were published on a special wall board. Enterprises also competed for the status of 'enterprise of high industrial culture', which included cleanliness of a workplace.⁷⁰ Enterprises themselves issued regulations that put the responsibility for dirty and inappropriate conditions at the factories on the workers themselves. They developed a system of punishments, such as admonishments (*vygovory*) and revoking of bonuses (*lishenie premii*), which were important boosts to basic wages, for poor hygiene of dairymaids in particular because they milked cows with mastitis.⁷¹ For example, in 1976, the head of the Vyborgsky milk factory revoked bonuses from all the workers because some of them did not clean the apparatuses and washing machines properly and did not check the health of cows before milking.⁷²

In this regard, dairymaids acquired a highly important status as mediators between milking operations and final consumers responsible for hygiene.⁷³ Soviet propaganda of the 1950s onward stressed that they were to be clean, cultured and knowledgeable about their professional duties, making them both products and triggers of progress in milk-making. Since the 1950s, after the automatization of the dairy and meat industry increased, dairymaids were educated for a new profession: master of automated milking. As specialists Arnol'd Karpa and Valentina Kotova wrote, 'the higher qualification of dairymaids had a great impact on the better quality of milk'.⁷⁴

Diligent and hard-working dairymaids who cleaned their workplaces became heroes of special printed issues and numerous newspaper articles where they praised the progress of the Soviet milk manufacturing industry.⁷⁵ For example, in the mid-1950s, propaganda highlighted a dairymaid of a *kolkhoz* named after Stalin in the Marushinsky region in West Siberia. Valentina Kuzovleva, we are told, attended the All-Union agricultural exhibition in Moscow in 1954 and returned to apply progressive methods of work, such as feeding animals routinely, strictly and at the same time.⁷⁶ Other dairymaids often stressed that hygiene and mechanisation were two crucial achievements of their age, thanks to Soviet power, thus appealing to typical Soviet rhetoric to combine personal input and state support. Thus, L.N. Tyapkina said that she worked with the best cattle at a mechanised animal farm which had earlier been a primitive village with old decaying huts belonging to a tsarist landowner. Tyapkina said that she worked there for three years and, as she put it, 'each time when entering the farm, I have a feeling that I am stepping into a big *laboratory* where everything is clean and well organised [emphasis added]'.⁷⁷ She emphasised that washing and massaging cows was part of her work routine which aimed to make bacteria-free food. A Vyborg regional newspaper wrote about another dairymaid working at a local milk factory, Alexandra Vasilyeva, who at the age of fifty-five looked as if she were forty because she worked and drank milk, a drink 'of beauty and youth'.⁷⁸ Vasilyeva said that her work helped her feel better and stronger and she had been committed to it since the end of the war. She remembered that in the 1940s she manually processed 30 litres of

⁷⁰ *Razrabotka i vnedrenie kompleksnykh sistem upravleniya kachestvom produktsii na predpriyatiyakh myasnoi promyshlennosti* (Moskva, 1978), 33.

⁷¹ Prikaz direktora, iyul' 1976 goda, Vyborgskii molochnyi zavod // Archival Department of the Administration of Vyborg Municipal Region. F.R-67. Op. 1. D. 267. L. 1.

⁷² Prikaz 'O narushenii trudovoi distsipliny', 1976 god // Archival Department of the Administration of Vyborg Municipal Region. F. 67. Op. 1. D. 267. L. 2.

⁷³ For example, *Moloko - marka nashei oblasti: Rasskazy doyarok* (Kostroma: Knizhnoe izd-vo, 1959).

⁷⁴ Arnol'd Karpa and Valentina Kotova, *Organizatsiya zagotovok i povyshenie kachestva moloka* (Moskva: TsNIITEIMinzaga SSSR, 1974), 17.

⁷⁵ This was very similar to the heroic narrative about women pig tenders (*svinarki*) who, according to the Soviet narrative, helped safeguard the wellbeing of pigs and contributed to the success of postwar pig farms. See more in Jenny Smith, 'Agricultural Involvement in the Postwar Soviet Union', *International Labour and Working-Class History*, 85 (2014), 59–74.

⁷⁶ Karpa and Kotova. *Organizatsiya zagotovok*, 23.

⁷⁷ L.N. Tyapkina, '6751 kilogramm moloka ot kazhdoi korovy', *Moloko - marka nashei oblasti* (Kostroma: Knizhnoe izd-vo, 1959), 62.

⁷⁸ *Zavod molochnykh ozer, Vyborgskii kommunist*, 3 iyulya 1973, 2.

milk per day, but by the early 1970s, she pasteurised over 40 tons.⁷⁹ Promoting food's new effects and qualities, such as making people more beautiful and healthier, was symptomatic of the whole Soviet period and antiseptic technologies and hygienic routines were to play a crucial role as a mediator in making modern products in late Soviet food discourse.

The new roles of dairymaids were connected to the notion of product quality as a category in turn connected with hygiene. Moreover, after the war, Soviet industrial authorities established inspections on the quality of production at the regional level, organising quality checks on animal and milk farms particularly. Later, they were rebranded as people's inspections to emphasise that their duty was one of public good, even though they were part of the state bureaucracy. Their archival reports demonstrate abuses of hygiene norms at the level of enterprises and whole territorial regions. In 1957, for example, inspections revealed multiple transgressions at the Vyborg milk factory in the Leningrad region, including dirty shops, washing departments and milk bottles and cisterns. They also said that some products, such as sour cream, were diluted and improperly stored.⁸⁰ To overcome that, scientific-technological organisations or the departments responsible for the development of food-making factories (NTOs) organised so-called 'demonstrations of quality' (*smotry kachestva*) where workers exhibited factory products, such as new varieties of cheese and butter. These events aimed to motivate factories to improve the quality of their production and increase the amount of top quality products. The quality, as one of their reports explained in 1971, meant better taste, saleable appearance and resistance to bacteria to provide safer and longer storage.⁸¹ By that time, the system of quality control had become increasingly well developed more generally at enterprises and administrations at the All-Union level.⁸²

Archival reports show that enterprises on occasion committed fraud by, for example, mixing fresh milk with spoiled milk, water and even oil, as happened in Vyborg in 1966. Sometimes milk was sold containing impurities.⁸³ Often, high levels of bacterial contamination were caused by badly washed bottles returned after the first use, as state bacteriological inspections revealed.⁸⁴ In 1974, a large-scale inspection of milk-receiving stations revealed 'enormous drawbacks and crimes' in many regions of the country, concluding that, 'to a large extent, the data submitted by milk processing enterprises [to the Ministry of Agriculture] do not correspond to the reality'.⁸⁵ They revealed that the situation was particularly bad in some national republics far away from the political centre, as well as in the most progressive cities, such as Moscow. In Turkmenistan, of the forty-seven large milk-collecting stations, 60 per cent did not have clean shops, 85 per cent did not pasteurise and cool milk, 90 per cent did not wash returned milk bottles when re-using them and 13 per cent used water from irrigation canals instead of tap water.⁸⁶ Similarly, in Latvia, milk went bad because of 'increased amount of microbial content' caused by hygiene and technical abuses. In September 1974, Latvian suppliers sold to the state 19.2 per cent of high-quality milk only, 67.7 per cent of milk of second class quality and 13.1 per cent of milk which was not appropriate for drinking at all.⁸⁷ In 1976, of 162 farms in

⁷⁹ Ibid.

⁸⁰ Vyborgskii gorodskoi Sovet narodnykh deputatov Leningradskoi oblasti. Ispolnitel'nyi komitet // LOGAV. F. R-437. Op. 2. D. 244. L. 13.

⁸¹ Informatsiya o vypolnenii tvorcheskikh obyazatel'stv kraevogo nauchno-tehnicheskogo obshchestva, 1971 g. // GARF. F. 5587. Op. 19. D.1003. L. 38.

⁸² Elena Tverdyukova, 'Obzory kachestva tovarov narodnogo potrebleniya Gosudarstvennoi inspeksii po kachestvu tovarov i trgovle po RSFSR kak istoricheskii istochnik (po materialam 'pyatiletki kachestva', 1976-1980 gg.)', in Z. Dmitrieva, *Vspomogatel'nye istoricheskie distsipliny*, vol. 36 (Saint-Peterburg: Dmitrii Bulanin, 2017), 118.

⁸³ Prikaz po Vyborgskomu gorodskomu molochnomu zavodu, 10 marta 1966 goda // Archival Department of the Administration of Vyborg Municipal Region. F. 67. Op. 1. D. 176. L. 49.

⁸⁴ Prikaz po Vyborgskomu gorodskomu molochnomu zavodu, 6 avgusta 1974 goda // Archival Department of the Administration of Vyborg Municipal Region. F. 67. Op. 1. D. 232. L. 119.

⁸⁵ Nachal'nik glavnogo upravleniya veterinarii D. Saifutdinov. Pis'mo v Ministerstvo sel'skogo khozyaistva SSSR, 1974 god // RGAE. F. 7486. Op. 40. D. 3660. L. 41

⁸⁶ Ibid.

⁸⁷ Spravka o sanitarno-gigienicheskom sostoyanii molochnykh ferm i meropriyatiyakh po povysheniyu kachestva moloka v kolkhozakh i sovkhozakh Latviiskoi SSR, 1974 god // RGAE. F. 7486. Op. 40. D. 3660. L. 44.

Moscow, forty-eight produced milk containing antibiotics and inhibiting agents used for slowing down the growth of microbes in milk. In some farms there was bleaching powder. As inspections reported, in 1976 some regions of the Russian Republic (RSFSR), up to 81 per cent of milk contained staphylococcus and up to 33 per cent of milk contained antibiotics.⁸⁸ This demonstrates the generally poor state of socialist food-making practices and abuses across the Soviet Union. Importantly, this criticism resonated with the movement against antibiotics and plastic packaging in some Western countries as a protest against the industrialisation of food-making.⁸⁹ In the Soviet Union, however, concern about the excessive use of antibiotics in food-making was not publicly advanced, but privately expressed by inspectors. At the same time, along with admiration, specialists viewed chemicals as not only important for improving food quality but also dangerous for health if they were excessively used in food-making operations. Biologist V.V. Molochnikov criticised Soviet enterprises for their excessive use of caustic soda for washing dishes, pipes and other equipment, which he described as an aggressive material, damaging apparatuses and degrading their capability to resist bacteria.⁹⁰ Narkomzdrav of the Soviet Union forbade the application of some synthetic food colorants, such as yellow naphthol, which was proven harmful to human health.

To a large extent, the microbacterial contamination of milk was a result of improper transportation from farms to enterprises and from enterprises to shops because of unsterilised automobiles and cisterns. Some scientists suggested new methods of collecting and transporting milk by cooling it in cisterns at farms and not transporting warm milk from farms to consumers, as had been the practice before.⁹¹ New technologies were believed to compensate for the problems with transportation and logistics typical of the Soviet economy. Technological fixes, such as cooling after the milking operation and the use of milk separators and filters, were mediators to make food better and, in particular, to make it safer and more hygienic.⁹² Compared to cooling and other technologies implemented during the Cold War, milk separators were a much earlier invention, but many Soviet enterprises suffered from a low level of mechanisation. Indeed, 'while many farms industrialised, machines did not always displace workers and . . . farm tasks were not always deskilled'.⁹³ Similarly, many dairymaids continued to milk manually, revealing that mechanisation was easier to plan than to implement.

Many explained the low levels of hygiene in terms of a lack of modern technological infrastructure and techniques, such as pasteurisation tools and refrigerators, which led to food-borne diseases.⁹⁴ Archival reports about checking and control of farms and meat and milk supplies referred to the fact that animal and chicken farms which supplied enterprises were short of washing and disinfecting chemicals, in particular chlorine and caustic soda.⁹⁵ The sources illustrate that the quality of products could be damaged at different steps in the production chain at farms, factories and food shops. This exemplified the general controversy of the Soviet approach to hygiene: while scientists insisted on the importance of cleanliness and enterprises made it part of the system of labour incentives, the reality

⁸⁸ *Tezisy dokladov k seminaru 'Obmen opytom raboty predpriyatii molochnoi promyshlennosti po priemke moloka v sootvetstvi s trebovaniem GOSTa 13264-70 na zagotavlivaemoe moloko'*, Tartu, 14–15 sentyabrya 1976 goda. (Moskva: TsNIITEIMyasmolprom, 1976), 4.

⁸⁹ See more in Smith-Howard, *Pure and Modern Milk*, 125.

⁹⁰ V. V. Molochnikov, 'Novye moyushchie i dezinfitsiruyushchie sredstva i poryadok ikh primeneniya na fermakh i predpriyatiyakh molochnoi promyshlennosti', in *Tezisy dokladov k seminaru 'Obmen opytom raboty predpriyatii molochnoi promyshlennosti po priemke moloka v sootvetstvi s trebovaniem GOSTa 13264-70 na zagotovlyvaemoe moloko'*. Tartu, 14–15 sentyabrya 1976 goda. (Moskva: TsNIITEIMyasmolprom, 1976), 23.

⁹¹ Zinochkina, *Opyt priema moloka*.

⁹² Kugenev, ed., *Zhivotnovodstvo i veterinariya*, 107.

⁹³ An important observation about agricultural involution is made in Smith, 'Agricultural Involvement', 59–60. See also Jenny Smith, *Plans and Realities on Soviet Farms, 1930–1963* (New Haven: Yale University Press, 2014).

⁹⁴ 'Deyatel'nost' organov sanitarno-pishchevogo nadzora po obespecheniyu bezopasnosti v sfere oborota prodovol'stviya v SSSR', *Problemy sotsial'noi gigieny, zdavoookhraneniya i istorii meditsiny*, 24, 1 (2016), 49–52.

⁹⁵ Pis'mo v Ministerstvo sel'skogo khozyaistva SSSR ot zamestitelya nachal'nika Glavka zhivotnovodstva i veterinarii M.T. Garbuza, 1974 god // RGAE. F. 7486. Op. 40. D. 3660. L. 15.

often did not correspond to these stated quality standards, often leaving hygiene a largely rhetorical matter.

Conclusion

The Soviet food industry contained a paradox: while poorly financed, it was nonetheless a critical industrial branch because of its role in making society function and providing the Soviet economy with labour resources. From the 1950s, food specialists working at Soviet research institutions and industrial enterprises played a particularly influential role in developing the notion of 'modern food': technological advancement in improving nutrition and facilitating more hygienic, i.e. microbe and bacteria-free, food-making became particularly important issues explaining industrially made food as sustainable, healthy and safe. Science would play a compensatory role for nature: it was to make up for the shortcomings of natural food for modern humans. Natural milk, for example, could not fully satisfy all the nutritional needs; scientific advancement in chemistry and microbiology was to help rectify this. In the course of rapid urbanisation and modernisation, it was declared, modern people were to receive enough vitamins, minerals and other useful elements. Basic nutritional products thus gained more complexity and symbolism in the last decades of the Soviet regime, showing the spread of strong beliefs in the possibilities of science to make food more suitable to modern people, as specialists put it. Modern food science was to solve this problem by enriching foods with vitamins and minerals, refining them and making them better-looking and more appetising. Traditional food items, such as milk and meat, were imbued with modern qualities which, on the one hand, implied their purity, free of bacteria, and on the other hand, implied their increased nutritional value due to vitaminising and mineralising. In addition, food-making was to be rationalised for saving time, freeing up energies for the builders of communism to focus on their major labour tasks. Food safety through the lens of hygiene was built into the system of incentives at late Soviet industrial enterprises, and use-value and quality were now more connected to safety from bacteria and health dangers due to the use of modern chemicals and the increased level of individual culture.

Professional visions of the new meanings of food were crucial in the context of the Cold War that filled food manufacturing with new importance and ideology, making food products a vaunted standard of modern life. Along with quantity quotas, quality standards were also introduced, informed by the desire to make food not just available but also modern. This was instigated by the Cold War rivalry and visions of modernity, becoming a major pillar of Soviet development. Khrushchev's impulse for enhancing the role of science and technology in harnessing progress for citizens' welfare further developed and even intensified in the later Soviet decades. Chemistry in particular was viewed as a field of investments to demonstrate the power of socialism not only in the military sector but also in a wide range of industries where chemistry could be applied. While the state invested in chemistry, Soviet scientists were the driving force behind initiatives to transform food-making through scientific research. They held that food chemistry and microbiology would change the qualities of food and make it better correspond to the modern consumer.

However, what became increasingly obvious from the 1970s to the late 1980s was that there was a problem at the point where experimentation and production met. The scientific image of food modernity ran up against backward technological and industrial infrastructure. Scientific experiments and industrial incentives contrasted sharply with the practices of the late state socialist economy, which was characterised by supply shortages and abuses in storage and transporting technologies at industrial farms, enterprises and shops. Poor hygiene conditions in the manufacturing, transporting and storing of food products was another strand of reality which contradicted the Soviet food discourse and high-minded scientific imaginary of modern food. Socialist food modernity had distinct limitations as it mainly concerned large cities and research laboratories which were to produce modern socialist food. The practical reality sat far off from the promises of modern food made by scientists and state officials: poor supplies and food shortages co-existed with active scientific research on making modern enriched food; abuses of food infrastructures, such as storage, transporting and selling,

co-existed with state discourse about the importance of technical and scientific achievements in making food for the modern labourer; and low hygiene levels in industrial production co-existed with a struggle for hygiene at food making industry. This intricacy demonstrated the disruptions between the state's imagination, scientific experiment and production practices in food-making. Food modernity began with professional research and beliefs in science but often ran aground on the realities of Soviet technological infrastructures.

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