

Food Consumption and Availability in Czechia in the Years 1993–2019

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Abstract

The article deals with comparison of consumption of food and beverages in the Czech Republic in the years 1993 and 2019 as well as of two main sources of food and food materials, their domestic production and cross border movements.²

Keywords

Food and beverages, consumption, agricultural production, self-sufficiency, cross border movements

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Q02, Q10, Q18

INTRODUCTION

The nutrition of the population belongs to basic indicators of the standard of living of our entire society. The Food and Agriculture Organization of the United Nations (hereinafter referred to as FAO) and the World Health Organization are the main bodies aiming to address global nutrition issues. Globally, it is estimated that almost 750 million, i.e. nearly 10 percent of the world population, were exposed to severe levels of food insecurity in 2019. Moreover, this number shows an increasing trend in recent years. On the contrary, especially high-income countries are currently facing an increasing obesity rate (FAO et al., 2020) and food waste. As for the latter phenomenon, Kubíčková (2021) estimates that the amount of wasted food in the Czech Republic reaches annually 830 thous. tonnes (81 kg per person per year), of which approximately 254 thous. tonnes (25 kg per person per year) of food waste is generated in households. To successfully address the problems of diet quality and rationalisation, we need reliable knowledge of food production, trade, and consumption.

The consumption of food and beverages in the Czech Republic had an increasing trend during the observed period. It was connected with favourable socio-economic conditions of recent years before the SARS-CoV-2 pandemic situation, which were represented by low unemployment rate and household income growing faster than their expenditures. While the average gross monthly wage increased since 1993 to 2019 by 478.0% to CZK 34.1 thous. (CZSO, 2021a), expenditures on food and non-alcoholic beverages rose by 224.3% to CZK 39.9 thous. per person per year and those on alcoholic beverages and tobacco by 277.0% to CZK 20.2 thous. per person per year (CZSO, 2021b).

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² This article is based on Mácová and Klémová (2021a, 2021b, and 2021c), and Mácová and Vodičková (2021).

Czechia has never been fully self-sufficient in all kinds of food, especially in vegetables and fruit (Máková and Klémová, 2021b). Cross border movements of food and food materials include not only food commodities that cannot be produced in situ due to climatic or other conditions; a significant part of our domestic agricultural production is sold abroad and, on the contrary, the same commodities are imported to us (Máková and Klémová, 2021c).

1 FOOD CONSUMPTION

The consumption of food and beverages has been surveyed in the Czech Republic (or former Czechoslovakia) since 1948 nearly in the current extent, with some statistical data being recorded even earlier, since 1918 (CZSO, 2014).

1.1 Methodology

The Czech Statistical Office uses a balance method for computation of consumption of food and beverages (CZSO, 2020). The input data are as follows:

- Animal production statistics in a respective year;
- Final harvest figures in a respective year;
- Production of selected industrial products in a respective year;
- Initial and final stocks in agricultural enterprises;
- Initial and final stocks in food processing enterprises;
- Imports and exports of food products based on statistics of cross border movements of the Czech Statistical Office in a respective year;
- Self-supply of food products.

Further data sources for the calculation are the Ministry of Agriculture, the Institute of Agricultural Economics and Information, food producers' unions and other organizations.

The consumption of particular items is calculated as average per capita figures. The number of inhabitants is given as the mid-year population as at 1 July of a respective year.

The input data do not include those food commodities that do not serve for human consumption, e.g. sugar for feeding bees or for production of ethanol, rapeseed oil for the production of FAME (fatty acid methyl esters), animal offal used in pharmaceutical production, milk for feeding or casein production, eggs and yeast for chemistry, seeds, etc.

Since 2002, the structure of food consumption items published follows the CZ-COICOP classification (the Czech version of the international Classification of Individual Consumption According to Purpose standard; designed to enable international comparisons and used in the Household Budget Surveys statistics), namely its first two divisions: 01 Food and non-alcoholic beverages and 02 Alcoholic beverages, tobacco and narcotics.

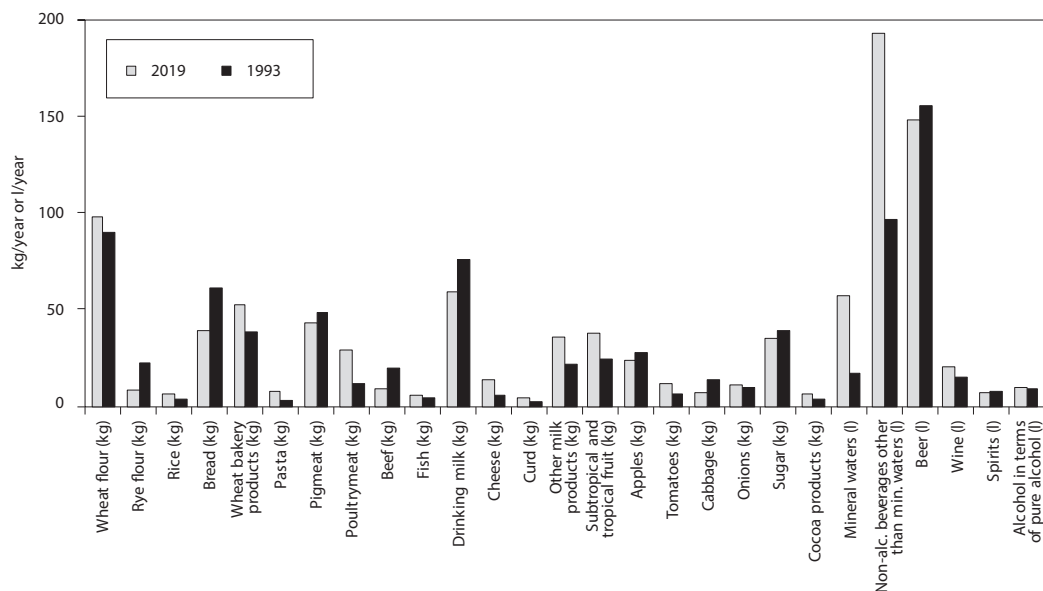
1.2. Main findings

According to the latest data for the year 2019, the average per capita food consumption in Czechia was 796.5 kg/year. It increased by 65.5 kg/year (8.9%) since 1993. Various trends were recorded for particular commodities or their groups: for example, increases were recorded for milk and milk products (+31.0%; to 249.0 kg), fruit (+19.0%; to 86.5 kg) and vegetables (+17.3%; to 87.0 kg); on the other hand, consumption of cereals in terms of flour (−2.2%; to 115.6 kg) or of potatoes (−17.3%; to 69.5 kg) decreased. Meat consumption almost did not change between 1993 and 2019 (−1.3%; 83.2 kg).

Figure 1 shows that there exist contradicting trends in consumption among particular commodities or their groups. As for cereals, the consumption rose for wheat flour and rice but declined for rye flour; among cereal products, it went down for bread but up for wheat bakery products and pasta. Pigmeat remained the most favourite meat type; however, poultrymeat replaced beef at the second position.

The consumption of fish slightly rose. We have consumed less drinking milk but more cheese, curd, and other milk products. Among fruit, the proportion of consumed subtropical and tropical fruit rose, although apples remained to be the most favourite ones. As for vegetables, tomatoes replaced cabbage at the leading position and onions remained to be the second most important item. The consumption of sugar declined but that of cocoa products, especially chocolate, rose. Mineral waters as well as other non-alcoholic beverages recorded a significant increase. Compared to 1993, we have consumed less beer and spirits but more wine in 2019; the consumption of alcoholic beverages in terms of pure alcohol went up.

Figure 1 Per capita consumption of selected food items



Source: Mácová and Klémová (2021a)

There have been some changes observed in the structure of consumption of food consumption during the observed period. The share of milk and milk products in the total volume of food consumed increased from 26.0% to 31.3%, the share of fruit from 9.9% to 10.9%, and the share of vegetables from 10.1% to 10.9%. The share of cereals in terms of flour fell from 16.2% to 14.5 %, the share of meat and fish from 12.1% to 11.2%, and the share of potatoes from 11.5 % to 8.7 %. These changes were caused by a variety of factors: some people responded to the recommendations of health nutritionists (which have changed over the course of the considered period), or to various fashion trends, or the price level of food was a determining factor for others. Last but not least, the food supply itself changed depending on the volume of domestic production and imports of food or material for its production.

1.3 Long-term trends since 1950

Some of the changes in amount and structure of consumed food have started long before the aforementioned period. As describes Vodičková (2017), three main groups of foods can be distinguished according their consumption trends. The first group includes foods whose consumption reached its maximum in the 1950s and has been declining since then. These are especially staple food items as for instance rye flour (decline from 55.5 kg per capita in 1950 to 8.6 kg in 2019), cows' drinking

milk (from 164.8 kg to 58.7 kg), bread (from 87.4 kg to 39.0 kg), or potatoes (from 145.9 kg to 69.5 kg). The second group represents food items having their peak consumption in late 1980s and early 1990s; it consists mainly of animal food products as beef (30.7 kg in 1987), milk and milk products (259.6 kg in 1989), pigmeat (50.0 kg in 1990), and also sugar (44.0 kg in 1990). The third group comprises foods whose consumption has been on the rise during recent years, frequently these highly processed or imported: for example subtropical and tropical fruit (increase from 2.2 kg in 1950 to 37.5 kg in 2019), poultrymeat (from 2.4 kg to 29.0 kg), cheese (from 1.6 kg to 13.8 kg), rice (from 0.9 kg to 6.7 kg), pasta (from 2.8 kg to 8.1 kg), or wheat bakery products (from 26.2 kg to 51.7 kg). An immense increase was observed in the consumption of mineral waters and other non-alcoholic beverages (from 12.8 l to 246.8 l); the consumption of alcoholic beverages rose as well (from 4.1 l to 10.0 l in terms of pure alcohol).

1.4 International comparison

There is no binding classification for food consumption statistics either in Czechia or at an international level. The FAO publishes its own calculations in its database (FAO, 2021). Their methodology differs from that of the CZSO, especially at the level of classification of individual items: for example, consumption of vegetables is differentiated into only a few items (tomatoes and its products, onions, other vegetables), whereas consumption of freshwater fish and several groups of marine fish and other aquatic animals is monitored separately. In addition to official statistics on food production and trade, FAO uses expert estimates, both its own and those provided by various specialised institutions.

The most recent data are currently available for 2018; for the sake of clarity, we present a comparison limited to the European Union only. For example, per capita consumption in Czechia compared to the EU28 average was lower for cereals and their products (CZ 102.1 kg; EU 129.9 kg), milk and dairy products (CZ 147.5 kg; EU 187.6 kg), vegetables (CZ 76.7 kg; EU 106.2 kg), fruit (CZ 61.9 kg; EU 87.8 kg) or fish (CZ 9.3 kg; EU 23.1 kg). Consumption of meat (CZ 83.7 kg; EU 80.0 kg) or potatoes (CZ 64.0 kg; EU 61.3 kg) was similar to the EU28 average. We have reached the leading position in the consumption of alcoholic beverages (CZ 175.7 kg; EU 97.8 kg).

2 DOMESTIC PRODUCTION AND FOOD SELF-SUFFICIENCY

Food self-sufficiency belongs to hot topics discussed by politicians and public in many countries, including the Czech Republic.

Since 1993, we have been steadily more than self-sufficient in beer production. Self-sufficiency in milk production and in beef production stayed above the 100% level despite a sharp reduction. Self-sufficiency dropped in the production of butter, cheese and curd, apples, or pigmeat from values of above 100% in 1993 to below this level in 2019. For other commodities, self-sufficiency in 1993 has already been below 100% and since then has even decreased; this applies for example to poultrymeat, eggs, carrots, wheat flour, onions, cabbage, or tomatoes. A reduction of domestic production together with an increase in consumption was recorded for wheat flour, milk, butter, tomatoes and onions. For poultrymeat and cheese and curd, there was an increase in domestic production, but their consumption has increased more significantly. Consumption of pigmeat, beef, eggs, apples, carrots, and cabbage decreased, but their production fell even more. Table 1 shows consumption, domestic production, and self-sufficiency for the abovementioned food commodities in 1993 and 2019.

The range and structure of production in the agricultural sector have changed since the beginning of the 1990s. Between 1993 and 2019, there has been a sharp decline in livestock numbers: by 43.5% for cattle, by 66.4% for pigs, and by 18.6% for poultry. The area under crops decreased as well, for example for cereals (by 15.8%), potatoes (by 78.2%), sugar beet (by 44.8%) or various types of vegetables (by 69.7% for vegetables, total). However, at the same time, yields of many of these crops have increased (by 42.5% for cereals, by 16.7% for potatoes and by 53.0% for sugar beet) so the losses of production area have been

compensated to some extent. Similarly, in livestock production, average milk yield per cow increased (by 121.6%) as well as average annual egg yield per hen (by 26.5%), the number of calves reared annually per 100 cows (by 5.7%), and the number of piglets reared annually per one sow (by 70.5%).

Table 1 Consumption, domestic production, and self-sufficiency for selected food commodities

	Self-sufficiency (%)		Domestic production			Consumption as food			Measuring unit
	1993	2019	1993	2019	Index (%)	1993	2019	Index (%)	
Beer	109.5	121.9	168.1	178.0	105.9	153.6	146.0	95.1	l
Milk	175.7	119.1	324.6	288.0	88.7	184.6	241.8	131.0	l
Beef	113.7	104.5	22.9	9.5	41.5	19.8	9.1	46.0	kg
Butter	152.0	65.8	8.1	3.6	44.4	5.3	5.4	101.9	kg
Cheese and curd	123.4	88.3	10.5	16.3	155.2	8.5	18.5	217.6	kg
Apples	108.5	75.3	29.8	18.0	60.4	27.5	23.9	86.9	kg
Pigmeat	104.3	43.4	50.2	18.7	37.3	48.1	43.0	89.4	kg
Poultrymeat	94.9	63.2	11.1	18.3	164.9	11.7	29.0	247.9	kg
Eggs	94.4	84.8	300.2	221.3	73.7	318.0	261.0	82.1	pcs.
Carrots	89.2	48.1	7.3	3.4	46.6	8.2	7.0	85.4	kg
Wheat flour	84.5	69.7	74.8	67.6	90.4	88.5	97.0	109.6	kg
Onions	84.2	43.2	8.5	4.8	56.5	10.1	11.1	109.9	kg
Cabbage	83.3	51.7	11.5	3.5	30.4	13.8	6.9	50.0	kg
Tomatoes	54.4	19.3	3.5	2.3	65.7	6.5	12.0	184.6	kg

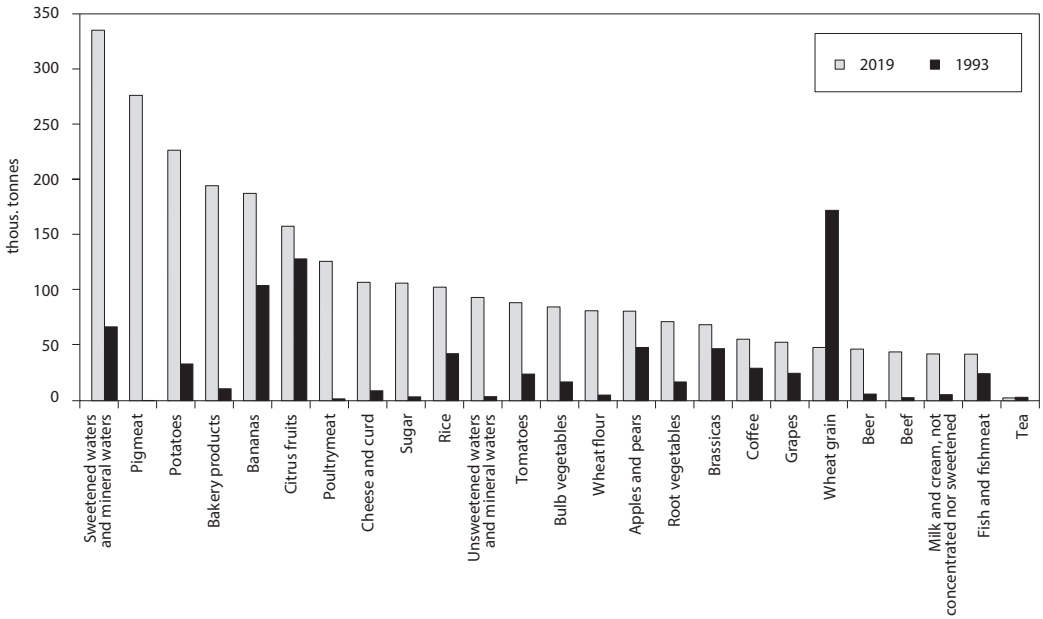
Source: Mácová and Klémová (2021a, 2021b) and author's own computation

The structure of agricultural production has also been adversely affected by the decline in the labour force due to a low attractiveness of working in the agricultural sector. According to the Annual National Accounts, 236.5 thousand persons were employed in the category Crop and animal production, hunting and related service activities in 1993 but only 138.9 thousand persons in 2019, i.e. by 41.3% less. The share of this category in the total employment fell from 4.7% to 2.6%. Last but not least, economic considerations are an important factor for primary producers in deciding which type of agricultural production to pursue. Farmers have an opportunity to benefit from various targeted subsidy programmes (currently, for example, it applies to potatoes, hops, fruit and vegetable production with very high or high intensity, rearing of beef calves, rearing of cows in a market milk production system, etc.). The prospect of selling their products, whether on domestic market or abroad, also plays an important role.

3 CROSS BORDER MOVEMENTS OF FOOD AND FOOD MATERIALS

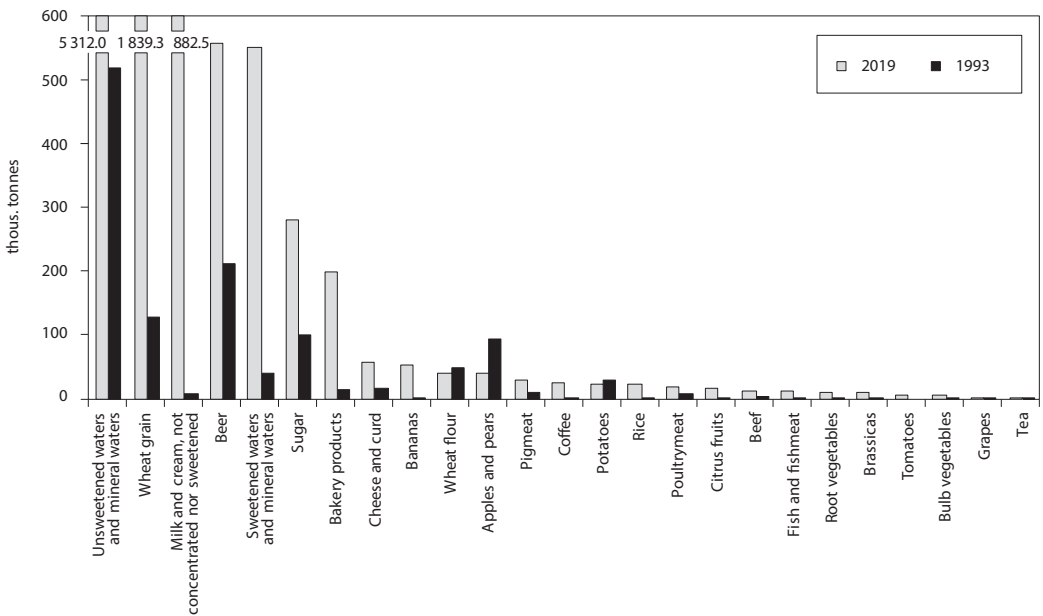
From 1993 to 2019, cross border trade relations with specific countries have evolved differently for various food commodities. The most important partner was and is unsurprisingly Slovakia, followed by Poland and Germany, and then other members of the European Union, but also Russia, for example. Conversely, some goods were and still are imported from countries very far away. At the same time, Czechia plays the role of a transit country, so that commodities that do not originate here also appear on the cross border export side. In the considered period, the re-export of foodstuffs brought to Czechia but not consumed here increased significantly.

Figure 2 Imports of selected food commodities



Source: Mácová and Klémová (2021c)

Figure 3 Exports of selected food commodities



Source: Mácová and Klémová (2021c)

A significant increase in the cross border movement of goods (hereinafter referred to as CBmG) occurred after 2004, when the Czech Republic joined the European Union and the single European market under the EU legislation removing tariff barriers (customs duties etc.) and quantitative restrictions for all types of goods.

Figures 2 and 3 show the amounts in tonnes of food commodities imported and exported, respectively, mentioned in the following text.

All three main meat types – beef, pigmeat, and poultrymeat – have recorded a positive balance of CBmG in 1993, while until 2019 it turned to negative. However, a substantial share of all types of meat consumed domestically comes from animals slaughtered in the country and for relevant live animals – cattle, pigs and poultry – the balance of the CBmG was positive both in 1993 and in 2019 with

Table 2 Main partners of Czechia in cross border movements of food commodities

	Imports		Exports	
	1993	2019	1993	2019
Beef	SK	PL/DE	RU	SK
Pigmeat	DK	DE/ES	RU	SK
Poultrymeat	SK	PL	DE	SK
Fish and fish meat	DE/NL	NO	SK	SK
Milk and cream, not concentrated nor sweetened	SK	SK	SK	DE
Cheese and curd	DE	DE	LB	IT
Potatoes	NL	DE	SK	SK
Tomatoes	SK	NL/ES	SK	SK
Bulb vegetables	NL	NL	SK	SK
Root vegetables	NL	NL	SK	SK
Brassicas	PL	PL	SK	SK
Bananas	CO	CO	SK	SK
Citrus fruits	ES	ES	SK	SK
Grapes	IT	IT	SK	SK
Apples and pears	NL	PL	AT	DE
Coffee	CO/HN	DE	SK	SK
Tea	IN/CN	PL/DE	SK	SK
Sugar	DE	FR	RU	AT
Wheat grain	DE	SK	RU	DE
Wheat flour	SK	SK	PL	SK
Rice	US	IT	SK	SK
Bakery products	SK	PL	SK	SK
Unsweetened waters and mineral waters	SK	SK	AT	PL
Sweetened waters and mineral waters	AT	PL	SK	SK
Beer	SK	PL	SK	SK

Source: Mácová and Klémová (2021c)

an increasing trend. In contrast, fish (other than live) and fish meat came from imports already in 1993 and this has not changed by 2019.

For the commodity milk and cream, not concentrated nor sweetened, we were a net exporter in 1993 and the surplus of CBmG had even significantly increased by 2019. Although the quantity imported increased, exports multiplied many more. On the other hand, the balance of the CBmG for cheese and curd turned from positive to negative.

The CBmG balance for various vegetables and fruits and also for potatoes was already negative in 1993 and has deepened by 2019. Imports of tomatoes, bulb vegetables, root vegetables, brassicas, bananas, citrus fruits, and grapes increased between 1993 and 2019 as well as their exports. Bananas represent an exotic fruit, which have been still imported mainly from their country of origin. The exception among fruits is the commodity apples and pears, whose balance was positive in 1993 but has fallen below zero by 2019.

Not surprisingly, the balance of CBmG for coffee and tea commodities is stably negative. Both imports and re-exports of coffee rose during the observed period, while imports and re-exports of tea remained almost the same. It should be mentioned that imports of coffee and tea underwent an interesting redirection from the countries of their origin to European countries dealing with their re-exports and/or processing.

Despite the decline in domestic sugar production, the balance of the CBmG remained positive between 1993 and 2019, although its quantity increased on both sides.

The CBmG balances for the commodities wheat and wheat flour showed opposite trends: In 1993, we have imported more wheat grain and less flour than in 2019. The amount of exported grain multiplied by more than 14 times until 2019, while the amount of exported flour recorded a slight decrease. The rice traded in Czechia, of course, also comes entirely from imports, which rose from 1993 to 2019 as well as its re-exports. The balance of CBmG for the commodity bakery goods remained positive in the period 1993 to 2019.

Czechia was a net exporter of unsweetened waters and mineral waters both in 1993 and in 2019. Their imports have risen more than 20 times in the period 1993–2019, but exports have increased even more than 100 times. In contrast, the balance of CBmG for sweetened waters and mineral waters was negative in 1993 but it had turned positive by 2019. Unsurprisingly, the CBmG balance for beer is positive in the long term and both imports and exports have increased from 1993 to 2019: imports almost 8 times and exports 2.6 times.

Table 2 shows the main partners of the Czech Republic in cross border movements in 1993 and 2019 for the abovementioned commodities.

CONCLUSIONS

The consumption of food and beverages in Czechia in the period 1993–2019 rose. While the domestic production and the food self-sufficiency in Czechia has declined for all surveyed commodities except beer, the role of cross border movements of food and food materials has significantly increased. Further data collections will show how these trends will be influenced by the SARS-CoV-2 pandemic situation.

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