DAIRY AND DAIRY PRODUCTS

Market situation

International dairy prices started to increase in the last half of 2016, with butter and whole milk powder (WMP) accounting for most of this increase. This reversed a decline in dairy prices that started in 2014 following a decrease in Chinese demand, the Russian Federation's ban on imports from several countries, and an increase in production from some key exporters. From January to December 2016, butter and WMP prices increased by around 40% and 56% respectively.

Butter prices have recovered significantly and future increases will be limited compared to other dairy products. The prices of other milk-based products, such as cheese and skim milk powder (SMP), have increased more slowly but are expected to continue to increase through 2017. The increase in dairy prices in 2016 was due to a slump in milk production in Australia, New Zealand and Argentina and the European Union (only in the second half of 2016), as well as a strong demand for some dairy products, particularly cheese and butter.

In Oceania, milk production has been limited for several reasons, including low dairy prices in 2015-16, adverse weather conditions related to *El Niño,* poor pasture conditions, and higher prices of cull dairy cows which resulted in a contraction of the dairy herd by 1.6% in 2016. This has encouraged a renewal of dairy herds with younger, more productive cows, although the monthly culling rate is slowing down as international dairy prices improve. Considering the production cycle of dairy herds, this suggests a slow recovery in inventories but an increase in yields. Although China, the largest importer of milk products, has decreased its imports, mainly WMP, from the highs of 2013-14, Oceania's dairy exports are slowly recovering, through higher exports to countries such as Algeria, Indonesia, Mexico, the Russian Federation, Yemen, Bangladesh, and Egypt. New Zealand has reduced its production of WMP, but increased its production of cheese in response to world demand.

Several factors (in particular the import ban imposed by the Russian Federation, production increases in New Zealand, Australia and the United States, the elimination of the quota restrictions; decreases in WMP and SMP exports to China) created a challenging environment for the EU dairy sector in 2015. This changed in mid-2016. On the supply side, 351 029 tonnes of skim milk powder (SMP) were removed from the market via public purchases through the EU intervention policy. The stock is projected to be released over the next two years. Both domestic and international cheese and butter consumption increased, and some key producers reduced their production. The European Union, however, increased its production, and its exports of cheese and butter grew by 9.5% and 23% respectively, while exports of SMP and WMP decreased by 18% and 5% respectively.

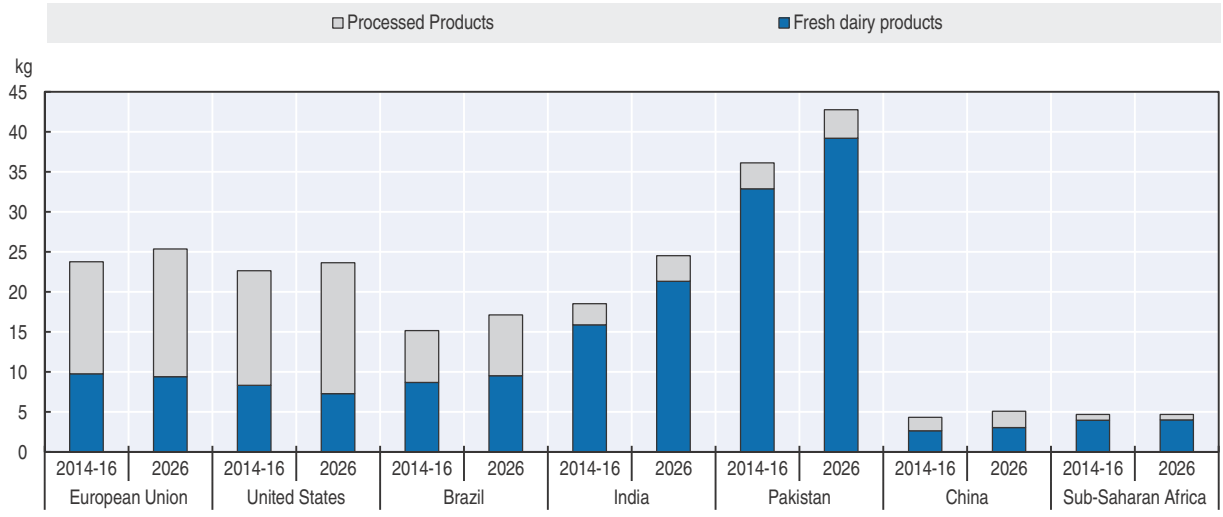
Projection highlights

There is renewed consumer enthusiasm in developed countries for butter and dairy fat over substitutes based on vegetable oil. This trend can be attributed to such factors as more positive health assessments on dairy fat, a change in consumer perceptions towards taste and towards less processed food, with the result that these products are increasingly used in bakery products and recipes. As incomes and population increase, and diets

become more globalised, more dairy products are expected to be consumed in developing countries. In developed countries, per-capita consumption is projected to grow from 20.2 kg in 2014-16 to 21.4 kg in 2026 in milk solids, compared with an increase from 10.9 kg to 13.2 kg in developing countries. There are, however, significant regional disparities amongst developing countries, where fresh dairy products will remain by far the most consumed; this contrasts with developed countries, where consumer preferences tend towards processed products (Figure 3.5).

Figure 3.5. **Per capita consumption of processed and fresh dairy products**

Milk solids



Note: Milk solids are calculated by adding the amount of fat and non-fat solids for each product; Processed products include butter cheese, skim milk powder and whole milk powder

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), *http://dx.doi.org/10.1787/agr-data-en*.

1 2 *http://dx.doi.org/10.1787/888933522092*

Although in some countries world milk production has been limited in recent years, it is projected to increase by 178 Mt (22%) in 2026, compared to the 2014-16 base period. The share of production from developed countries decreases over time, from 49% in 2016 to 44% in 2026. The majority of the increase in milk production (77%) is anticipated to come from developing countries, in particular Pakistan and India, which are expected to account for 29% of total milk production by 2026, compared to 24% in the base year. The expansion of milk production in developing countries at a rate of 2.7% p.a., is expected to be largely consumed domestically as fresh dairy products. At the world level, production of WMP is increasing at 1.9% p.a.; production of butter and SMP is expected to grow faster at 2% p.a. and 2.5% p.a. respectively, while cheese production should grow at 1.4% p.a.

Starting from a relatively low base in 2016, demand growth will support increases in dairy prices over the medium term. By 2026, cheese prices, currently lower than butter prices, will surpass the latter and be 38% higher than in the base period. The prices of milk powders increase slowly in the short term, due to the slow recovery of powder demand from China. Even though they are not expected to return to the highs of 2013-14, prices of SMP and WMP will increase by 76% and 60% respectively, between the base period and 2026, implying modest increases in real terms.

The projected depreciation over the medium term of the Argentinian and Brazilian currencies with respect to the United States dollar will encourage growth in exports from these countries as they become more competitive. On the import side, the currencies of most large importers – namely Philippines, Egypt, Islamic Republic of Iran, and Indonesia – are expected to depreciate, which will reduce their import demands. In the case of Japan, import demand is constrained by an ageing population, while in Canada the response is limited by the country's domestic dairy policies. Between the base period and 2026, the export share of dairy commodities increases for European Union from 24% to 28%. India – as the world's largest milk producing country – has a large expanding domestic market, and is not projected to become an important player on the export market.

The expanded dairy and dairy products chapter is available at
http://dx.doi.org/10.1787/agr_outlook-2017-11-en

DAIRY AND DAIRY PRODUCTS

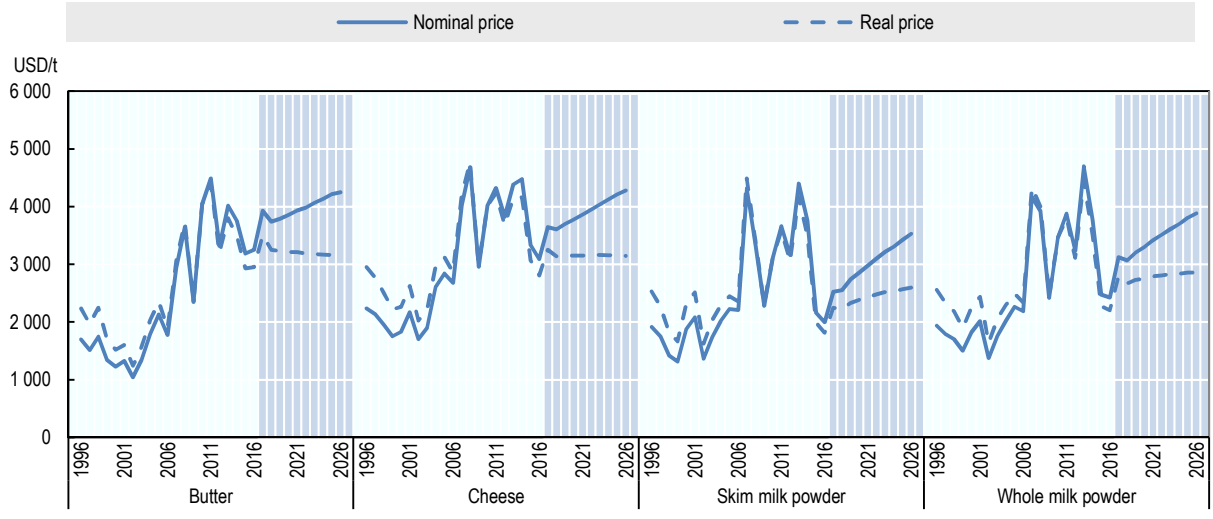
Prices

International dairy commodity prices surged during the second half of 2016, in particular for fat-based products, following sharp declines from 2013-2014 highs, which stemmed from a contraction in demand and excess supply. On the demand side, the People's Republic of China (hereafter "China") – the largest importer of whole milk powder (WMP) and skim milk powder (SMP) – decreased its imports while the Russian Federation imposed a ban for several dairy products on several major exporters – European Union, United States. Low input prices in the United States and the removal of quotas in the European Union led to a glut in supply. Production from some major exporters – Argentina, Australia, and New Zealand – shrank due to adverse weather conditions.

Over the next decade, the real price of butter will decrease while those of SMP, WMP and cheese will increase. In the short term, butter prices will continue to rise relative to other dairy products; as a result, further nominal price increases will be limited in the medium term compared to other dairy products. The prices for both powders and cheese start from low levels in the base period and are expected to continue increasing over the medium term (Figure 3.5.1). World prices of dairy products will be supported by strong demand for milk and dairy products - 26% higher in solid-milk basis in 2026. Nominal prices are not, however, expected to return to the peak levels of 2013.

Over the medium term, demand for milk and dairy products in developing countries is expected to rise as a result of increasing incomes, growing population, and trends in diets. Developing countries will represent 87% of the increase in consumption of dairy products in solid-milk basis, most of which will be consumed as fresh dairy products. In developed countries, the increase in consumption is mainly on processed milk products. Most of this growth in consumption will be satisfied by domestic production via increased dairy herds and rising yields, and in particular by imports in developing countries. Both production and consumption grow, however, at a slower pace than in the previous decade.

Figure 3.5.1. Dairy product prices



Note: Butter FOB export price, butter, 82% butterfat, Oceania, Skim Milk Powder, FOB export price, non-fat dry milk, 1.25% butterfat, Oceania; Whole Milk Powder, FOB export price, 26% butterfat, Oceania; Cheese, , FOB export price, cheddar cheese, 39% moisture, Oceania. Real prices are nominal world prices deflated by the US GDP deflator (2010=1).

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-data-en.

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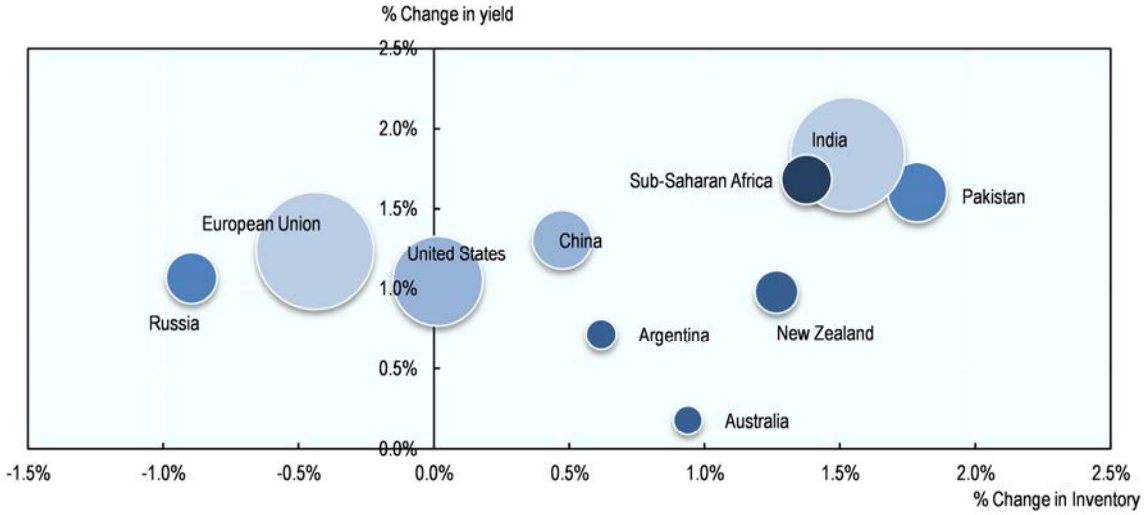
Production

Growth in world milk production is expected to decrease slightly over the next decade, from 1.94% per annum (p.a.) to 1.87% (p.a.). A 22% increase in milk production is projected in 2026 compared to the base year (2014-2016). Developed and developing countries will produce respectively an additional 10% and 34% of milk in 2026. Developed countries' share of milk production will, however, drop from 49% to 44% in 2026. Although dairy herds in developed countries are projected to decrease by -0.2% p.a., yield will grow by 1.1% p.a. over the medium term. Production growth in developing countries will be based on an increase in dairy herds of 1.1% p.a. and yield increases of 1.6% p.a. Despite projected yield improvements, many developing countries start from a low base, so the absolute increases in productivity will remain small. For most countries, increases in milk production over the medium term will come more from yield increases than higher inventories (Figure 3.5.2).

Figure 3.5.2. Annual changes in inventories of dairy herd and yields between 2017 and 2026



Note: The size of the bubbles refer to the total milk production in the base period 2014-16.

Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-data-en.

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The five largest milk producers in the base period are the European Union with a share in global production of 20%; India at 19%; the United States at 12%; and China and Pakistan, both at 5%. Asia will have the largest increase by 2026, with India and Pakistan accounting for most of the increase in production. India is poised to have the largest growth in milk production, outpacing the European Union to become the largest milk producer with a global share of 23% in 2026, followed by Pakistan with an average growth rate of 3.4% p.a. and a global share of 6% in 2026. In both countries, the vast majority of production is consumed domestically in its fresh form. Both the European Union and the United States will have a lower annual growth rate compared to the past decade; their shares will decline from 20% to 18% and 12% to 11% respectively. However, they will remain major players in export markets for processed dairy products.

European Union milk production is projected to grow at 0.8% p.a. in the coming decade slower than the 1.2% p.a. observed before, despite the end of the milk quota in 2015. This is due to declining domestic demand for fresh dairy products more specifically drinking milk, but counteracted by the growing domestic cheese demand and increasing dairy product exports. The milk production growth stems from an increase in milk yields at 1.2% p.a. over the next decade while the dairy herd is slightly declining (-0.4% p.a.). The European Union increases its share of world SMP production over the outlook from 34% to 37%. Its share of cheese production decreases from 44% to 42%, butter production from 21% to 20% while there is no change to its share of WMP (14%) production. Production of dairy products will grow at 1.3% p.a. over the next decade. The growth rate of SMP and cheese will decrease to 3.8% p.a. and 0.9% p.a. while WMP and butter will increase to 2.4% p.a. and 1.5% p.a.

Milk production in the United States is expected to increase by 1.1% p.a. during the next decade through mostly an increase in milk yields (1% p.a.). Compared to the past decade, production growth is slower, at 2.1% p.a.

for SMP, 0.4% p.a. for WMP, 1.9% p.a. for cheese and 2.4% p.a. for butter. The United States' share of world production of butter and cheese will increase slightly.

Although China will increase its production at 1.8% p.a., its share of world production remains at the same level (5%) in 2026. Most of the production will go towards fresh dairy products, growing at 2.1% p.a. China remains a major importer of dairy products and is projected to increase its imports over the next decade but at a slower pace.

Milk production in Latin American and Caribbean countries will increase by 18% compared to the base years. However, their share of world production will remain at 10%. Argentina – a major producer – suffered from adverse weather in 2016, causing a -14% decrease in milk production (data from January 2017, newer estimates point to a less severe reduction). Over the medium term, production will increase by 1.3% p.a. as the sector recovers. Similarly, Brazil suffered from drought conditions in 2015-2016 but is projected to increase its milk production by 2.2% p.a. Production of dairy processed products will grow at 2.1% p.a.

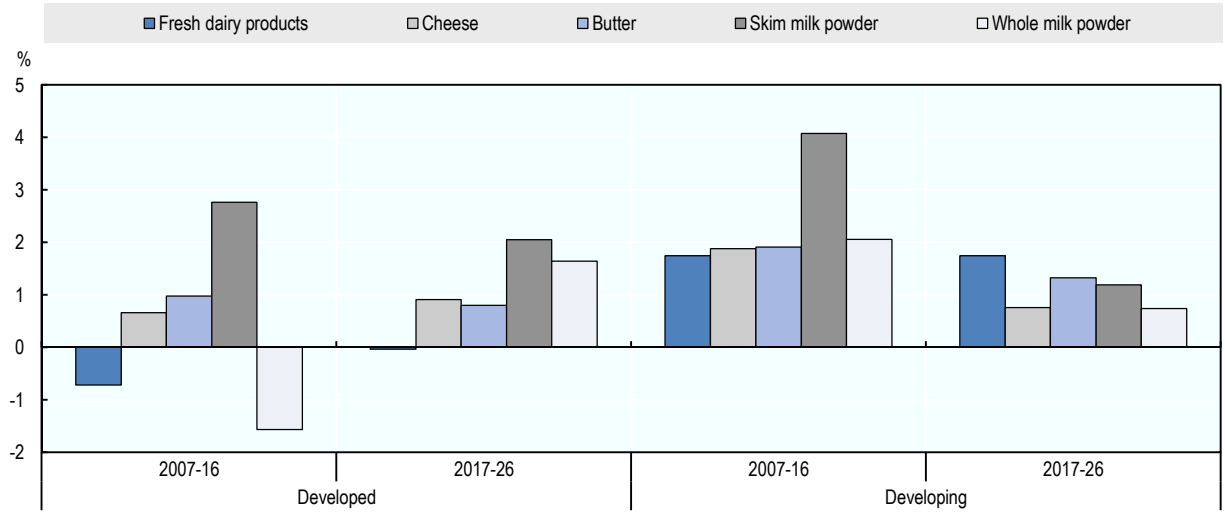
Although New Zealand is not the largest producer of dairy, it is the largest dairy exporter. Milk output growth is expected to be constrained in New Zealand compared to the previous decade, with growth slowing from 4% p.a. to 2.3% p.a. New Zealand is both a leading producer and exporter of WMP, and is projected to account for 24% of global production and 53% of global exports in 2026. Over the next decade, most of the growth will come from a further increase in the dairy herd (1.3% p.a.) and yield (1% p.a.).

In developed countries, the majority of milk production is transformed into butter, cheese, SMP and WMP. Developed countries produce 87% of the world's SMP production, 79% of cheese, 43% of butter and 46% of WMP in the base period. The global production shares of developed countries for butter and WMP in 2026 will decrease slightly in 2026. In terms of milk-solid basis, developed countries will increase milk production by 10% - of which 37% of that increase will go to cheese production, around 23% to SMP, 20% to butter, 10.5% to WMP and 8.5% to fresh dairy products. In developing countries, of the 33% increase in milk production in 2026, 85% will go to the production of fresh dairy products, 7% to butter, 4% to WMP, 3% to cheese and 0.6% to SMP.

Consumption

World consumption of fresh dairy products and processed dairy products is poised to grow annually by 2.1% p.a. and 1.7% p.a. respectively, over the next decade. The largest share of milk and dairy product consumption is in the form of fresh dairy products, taking up about 50% of the world's total milk production. This share continues to increase to 52% over the next ten years due to rising milk consumption in developing countries. Consumption dynamics differ considerably between developed and developing countries. Developed countries consume primarily processed milk products, with per capita consumption of cheese growing at 0.9% p.a., butter at 1.2% p.a., WMP at 1.6% p.a., SMP at 2.1% p.a. (Figure 3.5.3).

Figure 3.5.3. Annual growth rates of per capita consumption for dairy products



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-data-en.

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Developing countries will consume 67% of fresh dairy products, most of which is consumed in Asia. This share will rise to 73% over the decade. Per capita consumption of dairy products in developing countries is expected to increase by an average of 0.7% p.a. for WMP, 1.2% p.a. for SMP, 0.8% p.a. for cheese, 1.3 % p.a. for butter, and 1.8% p.a. for fresh dairy products. Except for cheese and fresh dairy products, these growth rates are considerably slower than those seen in the last decade. This is partly due to higher initial levels of consumption.

Large differences will remain in intake levels and consumption patterns between the different regions. While fresh dairy products intake will still make up the bulk of the per-capita consumption – around 70% – in the Sub-Saharan Africa, Eastern Europe, Central Asia and Asia-Pacific regions, butter and cheese will respectively account for 11% and 18% of dairy consumption in North Africa and 12% and 13% in the Middle East. SMP and WMP will take a share of 35% and 13% respectively of the per-capita dairy consumption in Southeast Asia while butter will account for 13% of consumption in the Asia Pacific countries. Per capita consumption of cheese and WMP in South America will remain at around 16% and 18%. In Sub-Saharan Africa, per capita consumption is projected to remain stable at a low level- around 4.7 kg per capita in solid milk basis. While some regions are self-sufficient, e.g. India, in other parts of the world, such as Africa, Asian countries and the Middle-East, consumption is growing faster than production, leading to a general expansion in dairy imports.

In developed countries, increasing per-capita consumption of processed dairy products - cheese and WMP - is also expected, and at higher rates than in the last decade. The high butter to vegetable oil price ratio is assumed to limit demand growth for butter and milk fat. Nevertheless, consumers in developed countries will consume an additional 0.35 kg of butter in 2026 due to preferences shifting in favour of butter over other oils and fats. Recent studies have shed a more positive light on the health implications of dairy fat consumption, as well as consumers' preference for taste and less processed food, encouraged its use in bakery products and recipes. Per capita consumption of fresh dairy products decreases slightly over the outlook period. Most of the increase in consumption of SMP is used in the manufacturing sector, notably in confectionary, infant formulas, and bakery products.

Trade

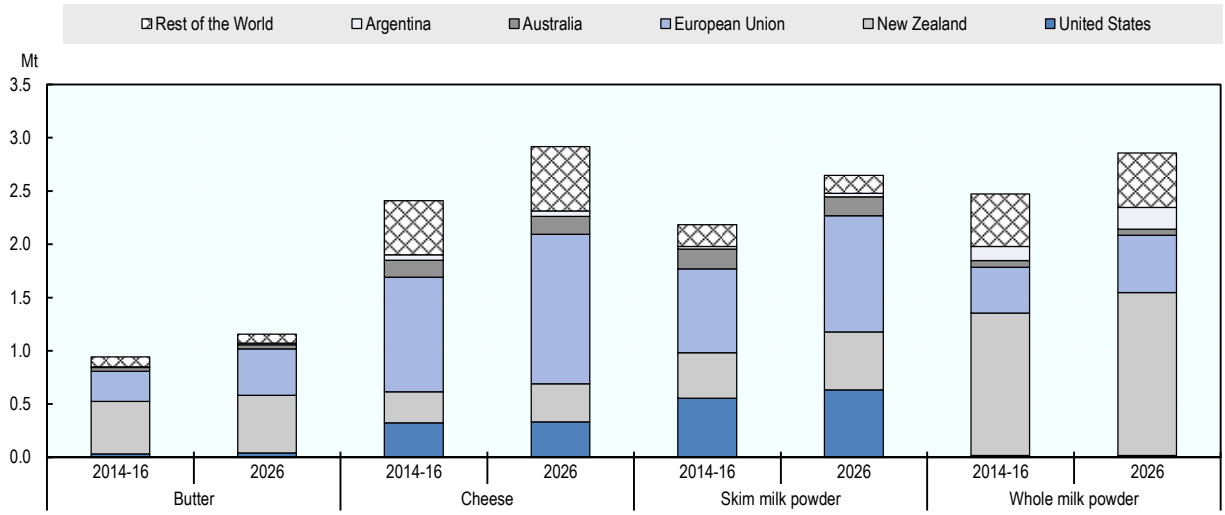
Around 82% of world exports of dairy products come from developed countries; this rate is projected to increase to 83% in 2026. Over the next decade, developed countries are projected to increase exports by 21%, implying an annual growth rate of 1.9% p.a. This is lower than the past decade as the projected growth in consumption of dairy products in developing countries slows down from 3.6% to 2.2% p.a. Growth rates in exports differ among dairy products: 2.1% p.a. for butter; 1.8% p.a. for cheese; 2% p.a. for SMP; and 1.6% p.a. for WMP. The four major exporters of dairy products in the base years are New Zealand with a share of 32%, the European Union (24%), the United States (12%) and Australia (6%). Except for the European Union, which sees its export share increase to around 28% in 2026, export shares slightly decrease for the other three. The four developed countries will jointly account for around 63% of world cheese, 73% of world WMP, 77% of world butter, and 87% of world SMP exports in 2026 (Figure 3.5.4). In the case of WMP, Argentina is also one of the main exporters accounting for 7% of world exports in 2026. While demand for fresh dairy products is much greater than for processed products, difficulties in transporting and storing fresh produce limit such trade.

New Zealand remains the primary source for butter and WMP on the international market, with market shares of around 47% and 53% by 2026. Its market share for WMP remains the same, however, and that of its butter exports decreases slightly compared to other major exporters, such as the European Union, by 2026. Given that China, a major importer of WMP, has drastically decreased its imports of WMP, it is projected that New Zealand will have a lower production growth rate of 1.6% over the next decade compared to 10% over the last decade. It is also projected that it will diversify and slightly increase its production of cheese over the outlook period.

The European Union will remain the main cheese exporter, accounting for 34% of world exports in 2026, followed by New Zealand and the United States at around 12% and 11% respectively. Over the next decade, export growth for these three countries will average 2% p.a. The increase in the European Union's share of the world cheese market in 2026 is sustained by increased exports to Canada via the CETA agreement, and the end of the ban imposed by the Russian Federation in 2017. China and Egypt will more than double their imports of cheese by 2026. Only about 11% of world cheese production is traded internationally, of which 43% is projected to be imported by developed countries in 2026.

The share of world WMP production that is exported in 2026 is projected to decrease from 48% to 45%, while the share of the other dairy products remains relatively the same as in the base years. In the case of WMP, it is expected that New Zealand's share of world trade will remain stable at 53% in 2026. The United States and the European Union are the two main exporters of SMP, and will account for 24% and 34% respectively of world exports in 2026. The European Union will increase its share of the export market for SMP by 2026. Developed countries export 93% and 75% of SMP and WMP, and developing countries import around 43% of the world SMP and WMP production in 2026.

Figure 3.5.4. Exports of dairy products by region



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", *OECD Agriculture statistics* (database), http://dx.doi.org/10.1787/agr-data-en.

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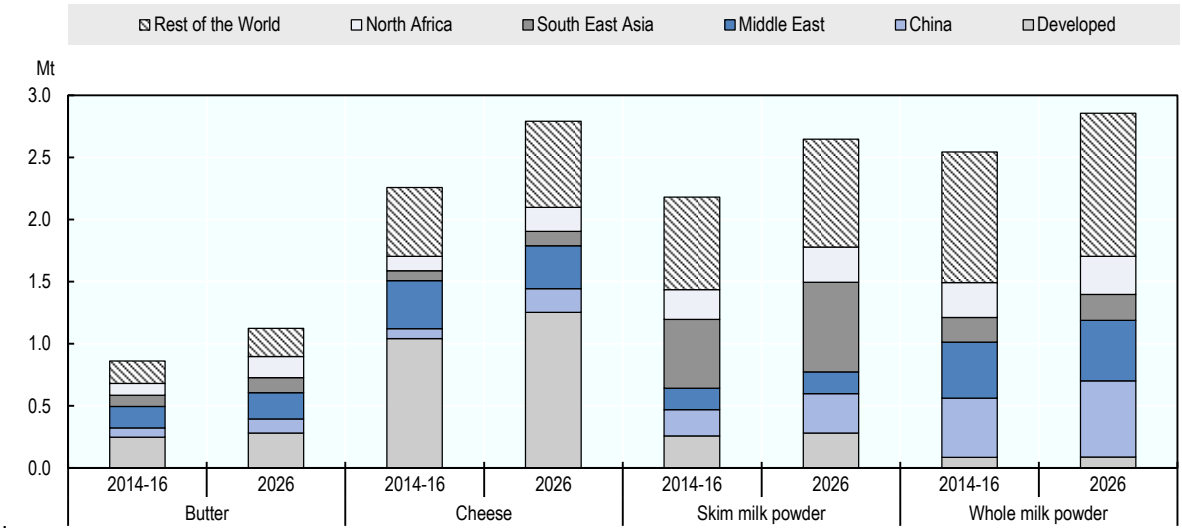
Figure 3.5.5. Import of dairy products by region



Source: OECD/FAO (2017), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-data-en.

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In contrast to dairy exports, imports are spread more widely across countries and the dominant destinations for all dairy products are developing countries, especially in Asia (50%) and Africa (16%) and the Near East (13%) in 2026. Developed countries import considerable levels of cheese and butter at around 46% and 29% of world imports in 2014-16, respectively; these percentages will decrease slightly by 2026. The Russian Federation, Japan, China, the United States and Mexico are projected to be the top five cheese importers in 2026. It is expected that cheese imports in developing countries will grow at a faster rate (2% p.a.) than in developed countries (1.6% p.a.). The main importers of butter are the Russian Federation, Egypt, China and Saudi Arabia, a reflection of increases in domestic consumption (Figure 3.5.5).

Developing countries imported 97% of global export of WMP in 2014-16 and the share is expected to remain constant. Asia is projected to increase its share of imports from 59% to 62% by 2026. China is the main importer and will import 22% of world trade by 2026. In 2014, it decreased its imports of WMP by 34%. This is expected to recover, but at a slower rate of 4.1% p.a. China's imports of cheese and butter should expand annually by 4.3% and 3.1%, respectively; by 2026, its share of world imports will be 10% for butter and 7% for cheese. Most of its dairy imports have been from Oceania, although in recent years, the European Union has increased its exports of butter and SMP to China.

Developing countries account for 88% of total SMP imports. The SMP market was less affected by decreases in China's imports, as there are a large number of importers on the market. China continues to be the world's major importer, with 5.3% p.a. growth in SMP imports. China's share in world imports will increase to 12% in 2026. Growth in other major importing countries – Egypt, Mexico, Algeria, Indonesia, Malaysia, the Philippines and Viet Nam – are projected to decrease over the outlook period compared to the last decade, due to higher base levels but also to limited growth in demand given the preference for fresh dairy products.

The Middle East and North Africa will remain key destinations. They will account for 35% of world butter imports and 19% of world cheese imports by 2026. The European Union has traditionally been an important trade partner for dairy products and has recently expanded its exports, especially of butter and cheese. Egypt is confirming its position as a major importer of butter, at 11% of total butter imports by 2026, as is Saudi Arabia, particularly of cheese.

Main issues and uncertainties

China's role as a major importer of dairy products is a key uncertainty. Small variations in domestic production and consumption can have a significant impact on the world market, as experience has shown when the country's imports of WMP expanded and decreased rapidly.

More specialisation and relocation of milk production has occurred in the European Union since April of 2015, the date milk quotas were removed. Several countries – Netherlands, Germany, Denmark, France, Italy – are concerned by environmental issues and may limit milk production increases.

Dairy demand and export opportunities could also be affected by the outcome of free trade agreements (FTA) and regional trade agreements (RTA) currently under discussion. The cessation of the Russian Federation's embargo on several dairy products from major exporting countries is expected to end in 2017 and imports will increase slightly but not return to the pre-ban levels.

World production may be constrained because of unforeseen weather events. Climate change increases the chances of drought, floods and disease threats which can be detrimental to the dairy sector.

Environmental legislation can have a strong impact on the future development of dairy production. Greenhouse-gas emissions from dairy activities make up a high share of total emissions in some countries. Any changes in related policies could affect dairy production. Water access and manure management are additional areas where policy changes could have an impact.

Changes in domestic polices remain an uncertainty. In Canada, the SMP export projections beyond 2021 are uncertain as changes are going on in the dairy industry to fulfil the Nairobi package. In European Union, the release of considerable SMP intervention stocks will limit the rise in SMP prices.