4. Oilseeds and oilseed products

This chapter describes the market situation and highlights the medium-term projections for world oilseed markets for the period 2020-29. Price, production, consumption and trade developments for soybean, other oilseeds, protein meal, and vegetable oil are discussed. The chapter concludes with a discussion of important risks and uncertainties affecting world oilseed markets during the coming ten years.

4.1. Market situation

Prices of oilseeds and products in 2019 were at their lowest in several years, a reflection of the slowdown in global demand for oils and protein meals, as well as the uncertainties stemming from bilateral trade disputes. Since trade relations between the United States and People's Republic of China (hereafter "China") improved towards the end of 2019, trade policies have had less short-term influence on world prices, especially for soybeans.

Global soybean production declined in 2019/20 due to the considerable decrease in plantings in the United States. In contrast, the soybean harvest in South America set a new record exceeding 190 Mt. Despite the decline in global soybean production, soybean prices did not increase, because of an even more pronounced contraction in soybean consumption. Notwithstanding expectations of a partial recovery in China's pig herd, African Swine Fever continues to weigh on the country's livestock sector, curbing feed demand, especially of soybean meal which is the dominant protein meal. World production of other oilseeds (rapeseed, sunflower and groundnut) declined slightly in 2019/20. Canada and the European Union reported a considerable shortfall of rapeseed production that was not offset by increases in other major producing countries.

The vegetable oil sector was characterised in January and February 2020 by a slowdown in demand growth in China and India caused by the decreases in out-of-home consumption. In China, this was due to the COVID-19 pandemic and in India to high domestic prices. Several countries also expanded their crushing capacity, thus increasing their seed imports at the expense of oil and meal purchases. Accordingly, exports by the main suppliers of vegetable oil, such as Indonesia and Malaysia, expanded less than average, leading to lower prices. In response to these factors, Indonesia introduced higher biodiesel mandates that led to an increase in domestic demand for palm oil. The slight decline in palm oil production of Malaysia balanced the domestic market there.

4.2. Projection highlights

During the outlook period, global soybean production is projected to continue to expand at 1.3% p.a., with the expansion of area harvested accounting for about a third of global output growth. With domestic output projected to reach 140 Mt by 2029, Brazil is expected to be the world's largest producer, ahead of the United States with a projected production of 120 Mt by 2029. Together, these countries are expected to account for about two-thirds of world soybean production.

Production of other oilseeds is projected to increase by 1.2% p.a. over the next decade, implying slower growth relative to the last ten years. This is due in part to curbed demand for rapeseed oil as a feedstock in European biodiesel production. Crushing of soybeans and other oilseeds into meal (cake) and oil will continue to dominate demand and increase faster than other uses, such as direct food/feed consumption of soybeans, groundnuts and sunflower seeds. Overall, 91% of world soybean output and 87% of world production of other oilseeds are projected to be crushed by 2029.

Vegetable oil includes oil obtained from the crushing of soybeans and other oilseeds (about 55% of world vegetable oil production), palm oil (35%), as well as palm kernel, coconut and cottonseed oils. In view of a slowdown in the expansion of the mature oil palm area, further production growth in Indonesia (1.7% p.a.) and Malaysia (0.8% p.a.) is projected to be limited. In addition, the rise in Indonesia's domestic biodiesel requirement will place upward pressure on global vegetable oil supplies in the medium term. Global demand for vegetable oil is projected to expand by 37 Mt by 2029, which is likely to draw down high inventories and support vegetable oil prices over the outlook period.

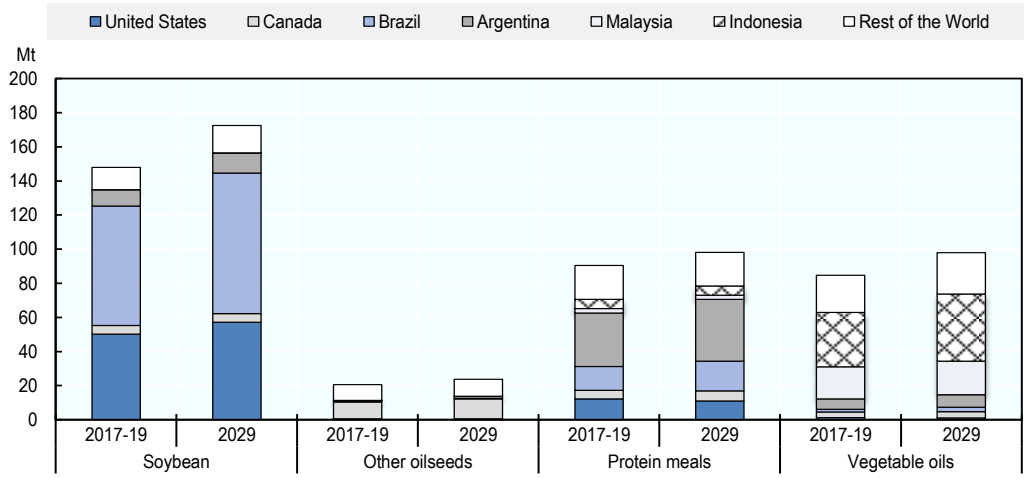
Soybean meal dominates protein meal production and consumption. Compared to the past decade, the expansion of protein meal utilisation (1.4% p.a. vs. 3.6% p.a.) is expected to be constrained by slower

growth in global production of pork and poultry, and by efforts in China to adopt a lower protein meal share in livestock feed rations. As a result, Chinese protein meal use is expected to grow slightly slower than animal production. Total protein meal consumption is expected to decline in the European Union as growth in animal production slows down and other protein sources are increasingly used in the feed mixtures.

Vegetable oil has one of the highest trade shares (40%) of production of all agricultural commodities. Indonesia and Malaysia, the world's two main suppliers of palm oil – the greatest single component of vegetable oil – will continue to dominate vegetable oil trade (Figure 4.1), exporting over 70% of their combined production and jointly accounting for nearly 60% of global exports. India, the number one importer of vegetable oil in the world, is projected to maintain a high import growth of 3.2% p.a. due to a growing population and higher incomes.

Growth in world trade of soybeans, dominated by the Americas, is expected to slow considerably in the next decade, a development directly linked to the projected slower growth in the crushing of imported soybeans in China. In parallel, Brazil will consolidate its position as the world's largest exporter of soybean.

Figure 4.1. Exports of oilseeds and oilseed products by region



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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Protein meal demand is linked to the expansion of animal production. The uncertainty around the future of pork production due to African swine fever in East Asia could affect the projections as pork might be replaced in the long term by other animal protein (e.g. poultry and fish) requiring less feed in the production. The outbreak of several diseases in China's pig herd during recent years induced a slowing of demand for protein meal and remains a large uncertainty over the outlook period. In addition, concerns about genetically modified products have led growing numbers of European Union milk producers to refrain from using genetically modified products as feed, especially soybean meal. This might further reduce protein meal demand as the European Union accounted for 15% of world protein demand in 2017-19.

The scope to increase palm oil output in Indonesia and Malaysia will increasingly depend on replanting activities and accompanying yield improvements (as opposed to area expansion), which in recent years have been sluggish given the low profitability of the sector, rising labour costs in Malaysia, and the limited scale of public replanting programmes in Indonesia, especially for small-holders. Progress has been reported for major palm oil companies in Indonesia, where old palm oil plantations have been uprooted and replanted with higher yielding palms. Sustainability concerns also influence the expansion of palm oil output as demand in developed countries favours oils that are not associated with deforestation and

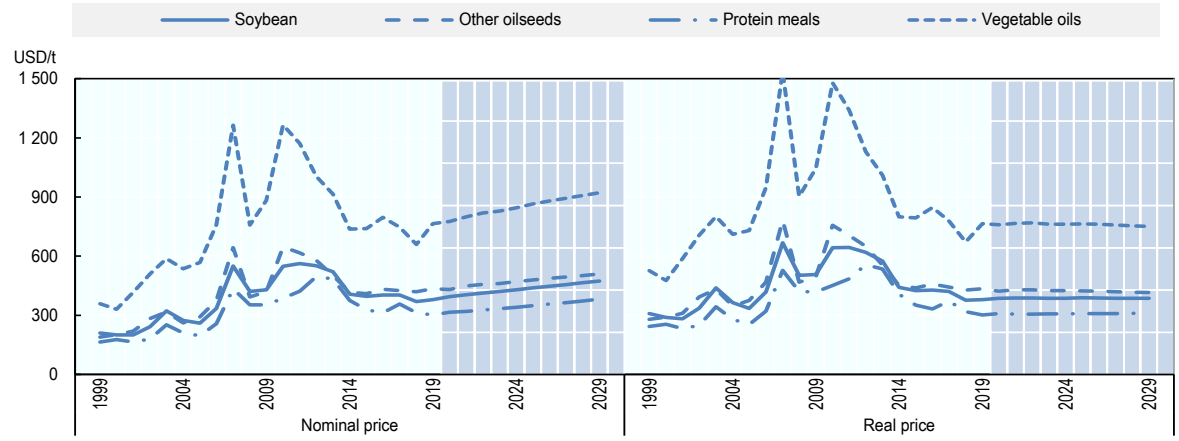
consumers seek sustainability certifications for vegetable oil used as biodiesel feedstock and, increasingly, for vegetable oils entering the food chain.

4.3. Prices

The price of oilseeds and oilseed products increased in 2019 as supply increased slower than demand. Stocks, however, remain ample. The assumed stable real price of crude oil and sustained economic growth should support the price of oilseed and oilseed products over the projection period, whereas continued productivity growth will put downward pressure on real prices. The COVID-19 pandemic reduced economic activity in 2020 and could have a considerable impact on the development over the next decade.

Real prices for soybean, other oilseed, vegetable oil and protein meal are projected to decline slightly as productivity growth is expected to keep pace with growing demand over the coming ten years. Real prices will nonetheless remain above historical troughs (Figure 4.2). In nominal terms, prices of oilseeds and oilseed products are expected to rise over the medium term, although they are not expected to attain previous highs.

Figure 4.2. Evolution of world oilseed prices



Note: Soybeans, US, c.i.f. Rotterdam; Other oilseeds, Rapeseed, Europe, c.i.f. Hamburg; Protein meal, production weighted average price for soybean meal, sunflower meal and rapeseed meal, European port; Vegetable oil, production weighted average price for palm oil, soybean oil, sunflower oil and rapeseed oil, European port. Real prices are nominal world prices deflated by the US GDP deflator (2019=1).
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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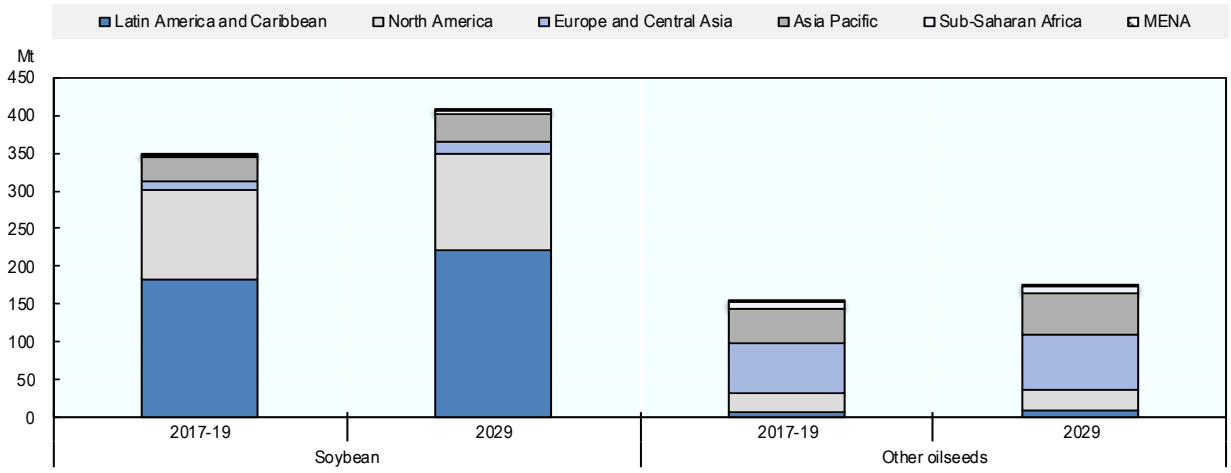
4.4. Oilseed production

The production of soybeans is projected to grow by 1.3% p.a., compared to 4.0% p.a. over the last decade. The production of other oilseeds (rapeseed, sunflower seed, and groundnuts) will grow at a slower pace, at 1.2% p.a. compared to 2.8% p.a. over the previous ten years (2010-2019). Growth in other oilseeds is dominated by yield increases, accounting for 78% of production growth, compared to 66% of overall production growth derived from yields in the case of soybeans. Soybeans benefit from their fast growth, which allows for double-cropping production, especially in Latin America.

Brazil and the United States are currently producing similar amounts of soybeans (around 115 Mt in 2017-19), but over the next decade, the projected growth in Brazil (1.5% p.a.) should be stronger than in the

United States (0.6% p.a.), mainly due to the possibility of increased cropping intensity by double cropping soybean with maize. Overall, the production of soybeans is projected to grow strongly in Latin America, with Argentina and Paraguay producing 61 Mt and 12 Mt respectively by 2029 (Figure 4.3). In China, after a decade in which production decreased, soybean production is expected to resume growth in response to reduced policy support for the cultivation of cereals. Soybean production is also expected to grow in India, the Russian Federation, Ukraine, and Canada.

Figure 4.3. Oilseed production by region



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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China (which produces mainly rapeseed and groundnuts) and the European Union (a major producer of rapeseed and sunflower seed) are the most important producers of other oilseeds, with projected annual output of 31 Mt and 27 Mt respectively by 2029. However, limited growth in output is projected for both regions (1.0% p.a. for China and -0.02% p.a. for the European Union) as relatively higher prices for cereals are expected to generate strong competition for limited arable land. Canada (23 Mt in 2029), another major producer and the largest exporter of rapeseed, is projected to increase its production by 1.9% p.a. Strong growth in other oilseed production is projected for Ukraine and the Russian Federation, in line with the ongoing expansion of the agricultural sector in the Black Sea region. In India, other oilseeds production is expected to expand faster over the next ten years as the government continues to support production in order to respond to increasing domestic demand for vegetable oils and protein meal (see discussion below).

Soybean stocks are projected to remain unchanged, which implies that the world stock-to-use ratio would decline from 12.4% in 2017-19 to 11.3% in 2029. Given the global trend to gradually concentrate oilseed production in a few major producing countries, the declining stock-to-use ratio could result in increased price volatility.

4.5. Oilseed crush and production of vegetable oils and protein meal

Globally, the crushing of soybeans and other oilseeds into meal (cake) and oil accounts for about 90% of total usage. The demand for crush will increase faster than demand for other uses, notably direct food consumption of soybeans, groundnuts and sunflower seeds, as well as direct feeding of soybeans. The

crush location depends on many factors, including transport costs, trade policies, acceptance of genetically modified crops, processing costs (e.g. labour and energy), and infrastructure (e.g. ports and roads).

In absolute terms, soybean crush is projected to expand by 56 Mt over the outlook period, well below the 103 Mt of the previous decade. Chinese soybean crush is projected to increase by 22 Mt, accounting for about 40% of the world's additional soybean crush, the bulk of which will utilise imported soybeans. The growth in China although large is projected to be considerably lower than in the previous decade. Crush of other oilseeds is expected to grow in line with production and to occur more often in the producing country compared to soybeans. This implies a much lower trade share for other oilseeds than for soybeans.

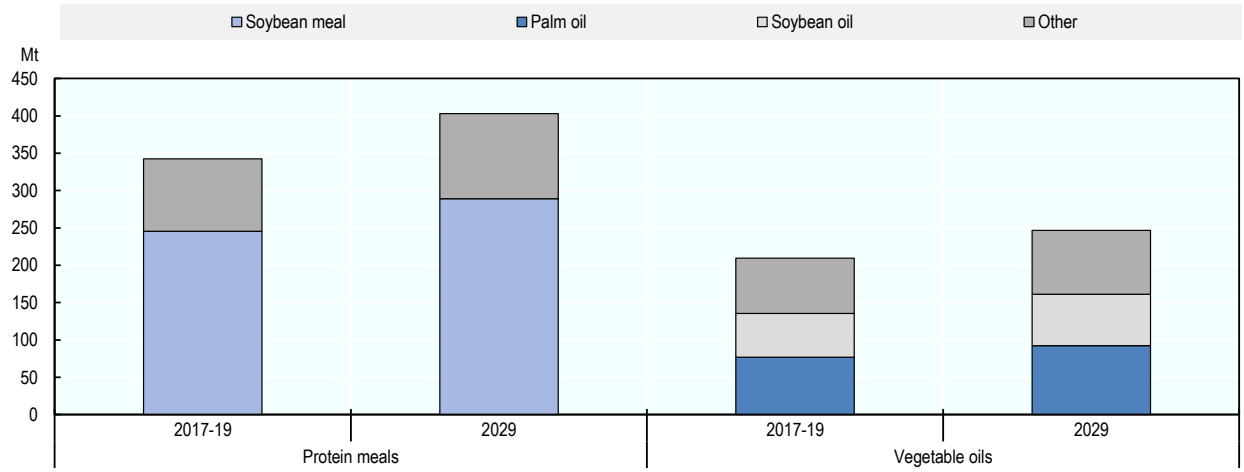
Global vegetable oil production depends on both the crush of oilseeds and the production of perennial tropical oil plants, especially palm oil. Global palm oil output has outpaced the production of other vegetable oils in the past decade. However, growth in production of palm oil is expected to weaken due to increasing sustainability concerns and efforts to reduce deforestation caused by the oil palm plantations in Indonesia and Malaysia. These two countries account for more than one-third of the world's vegetable oil production.

At the global level, palm oil supplies are projected to expand at an annual rate of 1.5%. Increasingly stringent environmental policies from the major importers of palm oil and sustainable agricultural norms (e.g. in the context of the 2030 Agenda for Sustainable Development) are expected to slow the expansion of the oil palm area in Malaysia and Indonesia. This implies that growth in production comes increasingly from productivity improvements, including an acceleration of replanting activities. Palm oil production in other countries is expected to expand more rapidly from a low base, mainly for domestic and regional markets. For example, Thailand is projected to produce 3.8 Mt by 2029, Colombia 2.4 Mt, and Nigeria 1.4 Mt. In certain countries of Central America, niche palm oil production is developing from the outset with global sustainability certifications in place, positioning the region to eventually reach broader export markets.

The vegetable oil aggregate includes palm kernel, coconut and cottonseed oil, as well as palm oil and oil extracted from the crush of oilseeds as analysed above. Palm kernel oil is produced alongside palm oil and follows the production trend of the latter. Coconut oil is mainly produced in the Philippines, Indonesia, and oceanic islands. Palm kernel oil and coconut oil have important industrial uses, and dominance has shifted towards palm kernel oil along the growing production of palm oil. Cottonseed oil is a by-product of cotton ginning, with global production concentrated largely in India, the United States, Pakistan, and China. Overall, vegetable oil production is projected to increase globally by 1.4% p.a., a higher rate than most agricultural commodities covered in this *Outlook*, driven mainly by food demand in developing countries resulting from population and income growth.

Global protein meal output is projected to expand by 1.4% p.a., reaching 403 Mt by 2029. World production of protein meals is dominated by soybean meal, which accounts for more than two-thirds of world protein meal production (Figure 4.4). Production is concentrated in a small group of countries. Argentina, Brazil, China, the European Union, India, and the United States are projected to account for 73% of global production by 2029. In China and the European Union, most protein meal production comes from crushing of imported oilseeds, primarily soybeans from Brazil and the United States. In the other important producing countries, domestically produced soybeans and other oilseeds are the dominant raw material.

Figure 4.4. Protein meal and vegetable oil production by type



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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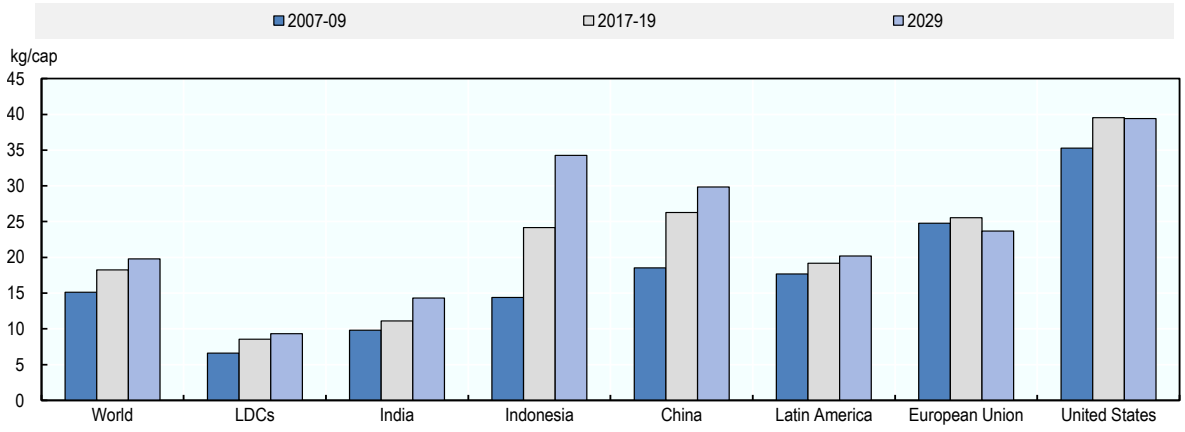
4.6. Vegetable oil consumption

Due to saturated per capita food demand, per capita consumption of vegetable oil for food is projected to grow by 0.9% p.a., considerably less than the 2.3% p.a. increase observed during 2010-19. In China (30 kg/capita) and Brazil (24 kg/capita), the per capita level of vegetable oil food availability is set to reach levels comparable to those of developed countries, for which growth in vegetable oil food consumption is projected to level off at 27 kg/capita, growing at 0.6% p.a. (Figure 4.5).

Figure 4.5. Per capita food availability of vegetable oil in selected countries



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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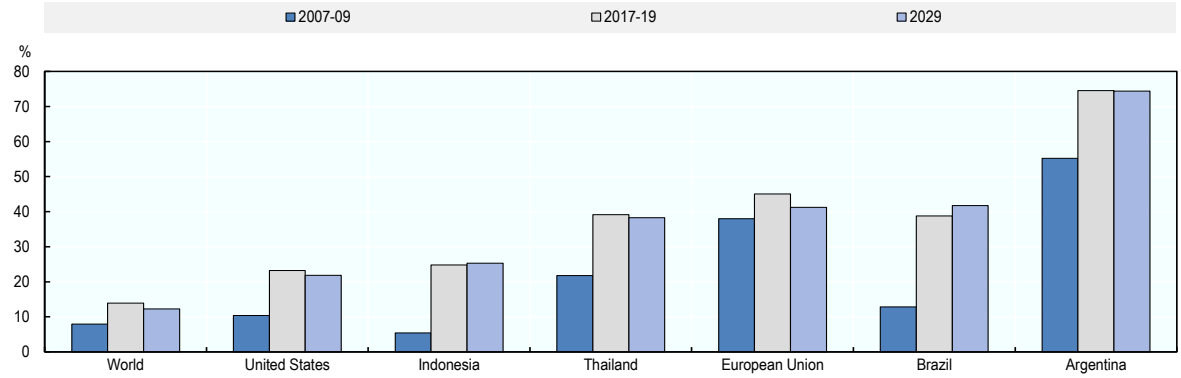
India, the world's second largest consumer and number one importer of vegetable oil, is projected to maintain a high per capita consumption growth of 2.3% p.a., reaching 14 kg/capita by 2029. This substantial growth will be the result of both expansion of its domestic production, crushing of increased

domestic oilseed production, and a further increase in imports of mainly palm oil from Indonesia and Malaysia. For least developed countries (LDCs), the per capita availability of vegetable oil is projected to increase by 0.8% p.a., to reach 9 kg per capita by 2029. As urbanisation increases in developing countries, dietary habits and traditional meal patterns are expected to increasingly shift towards more processed food having a high content of vegetable oil.

The uptake of vegetable oil as feedstock for biodiesel is projected to increase at considerably slower pace over the next ten years, compared to the 4.3% p.a. increase recorded over the previous decade when biofuel support policies were taking effect. In general, national targets for mandatory biodiesel consumption are expected to increase less than in previous years. In addition, used oils, tallow, and other feedstocks are increasing their share in the production of biodiesel largely due to specific policies (see Chapter 9 for more details on biofuels). Argentina is expected to maintain an export-oriented biodiesel industry (more than half of the biodiesel produced is exported). Vegetable oil uptake by Argentina's biodiesel industry is projected to be 3.1 Mt by 2029, equivalent to 74% of domestic vegetable oil consumption (Figure 4.6). In Indonesia, the growth in the use of vegetable oil to produce biodiesel is projected to remain strong due to supportive domestic policies. Thus, Indonesia is the main driver for the increasing use of vegetable oil as feedstock for biodiesel in the world. The use of vegetable oil as feedstock for biodiesel depends of the policy setting (see Chapter 9) and the relative price development of vegetable oil and crude oil (see below).

Figure 4.6. Share of vegetable oil used for biodiesel production



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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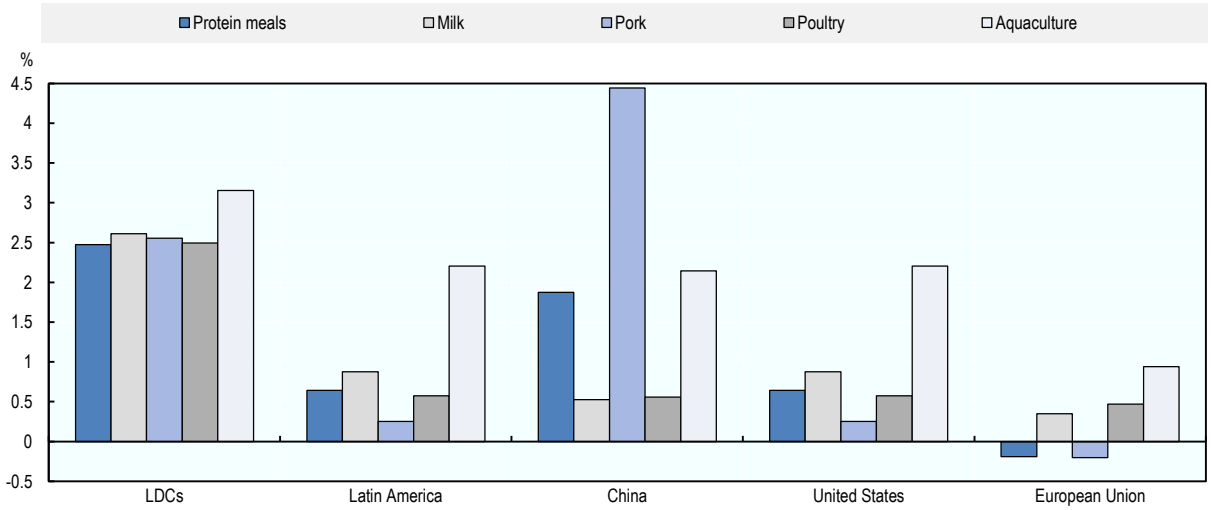
4.7. Protein meal consumption

Protein meal consumption is projected to continue to grow at 1.4% p.a., considerably below the last decade's growth rate of 3.4% p.a. The growth in protein meal consumption is closely linked to the development of feed demand, as protein meal is exclusively used as feed. Several factors influence the link between feed use of protein meal and animal production: intensification of animal production increases demand for protein meal, whereas feeding efficiencies led to a reduction of protein feed per animal production output; composition of animal husbandry and herd sizes are additional determining factors. The link between animal production and protein meal consumption is associated with a country's degree of economic development. Lower income countries, who rely on backyard production, consume less protein meal and whereas higher income economies who employ intensive production systems, use higher amounts of protein meal. As economies develop, production shifts towards more feed-intensive production systems, and protein meal consumption increases (Figure 4.7).

Because of a shift to more feed-intensive production systems in developing countries in response to rapid urbanisation and increasing demand for animal products, growth in protein meal consumption tends to exceed growth in animal production. In LDCs, where the use of protein meals is very low, intensification in livestock production with more widespread use of compound feed is expected to continue. With intensification, the use of protein meal per unit of livestock production increases considerably leading to fast growth in total demand in these countries. In countries such as the United States and in the European Union, where compound feed satisfies most protein requirements of animal production, protein meal consumption is expected to grow slower than animal production due to improving feeding efficiencies. In addition, animal products are increasingly marketed in the European Union as produced without feed use from genetically modified crops.

Growth of protein meal consumption in China is projected to decline from 5.0% p.a. in the last decade to 1.9% p.a. Growth in China's demand for compound feed is expected to shrink due to declining growth rates for animal production and the existing large share of compound feed-based production. Furthermore, the protein meal content in China's compound feed is expected to remain stable as it surged in the last decade and considerably exceeds at present the levels found in the United States and European Union.

Figure 4.7. Average annual growth in protein meal consumption and animal production (2020-29)



Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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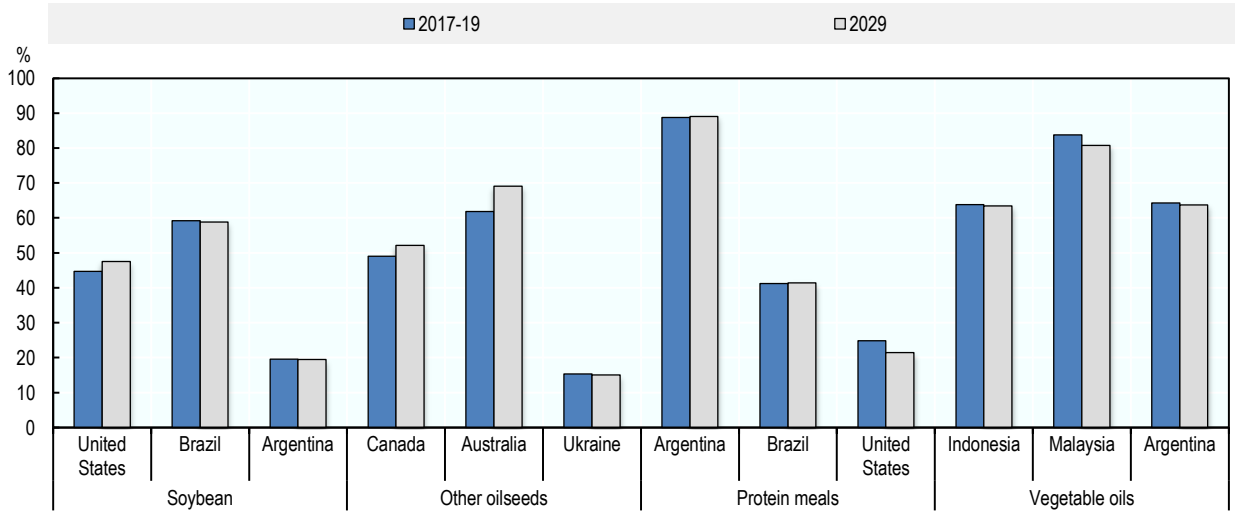
4.8. Trade

Over 40% of world soybean production is traded internationally, a high share compared to other agricultural commodities. Compared to the previous decade, the expansion in world soybean trade is expected to decelerate considerably during the outlook period. This development is directly linked to projected slower growth of the soybean crush in China and subsequent imports. Chinese soybean imports are projected to grow by 1.8% p.a. to about 105 Mt by 2029, accounting for about two-thirds of world soybean imports. Exports of soybeans originate predominately from the Americas – the United States, Brazil and Argentina – and are projected to account for a stable 88% of world soybean exports by 2029. Whereas the United States was historically the largest global exporter of soybeans, Brazil has taken over that role with steady growth in its export capacity. By 2029, it is projected that Brazil will account for 48% of total global exports of soybean, 1 percentage point higher than currently.

For other oilseeds, its share of global production traded is much lower at about 14% of world production. Important exporters are Canada, Australia, and Ukraine, which are projected to account for more than 73% of world exports by 2029. In Canada and Australia, more than half of the other oilseed (rapeseed) production is exported (Figure 4.8). Additional oilseed production is often exported in the form of vegetable oil or protein meal.

Figure 4.8. Share of exports in total production of oilseeds and oilseed products for the top three exporting countries



Note: The figure only shows the direct share of exports and does not include the export of further processed products, which would lead to higher export shares.
Source: OECD/FAO (2020), "OECD-FAO Agricultural Outlook", OECD Agriculture statistics (database), http://dx.doi.org/10.1787/agr-outl-data-en.

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Vegetable oil exports, which amount to 40% of global vegetable oil production, continue to be dominated by a few players. Indonesia and Malaysia are expected to continue to account for 60% of total vegetable oil exports during the outlook period. Argentina is projected to become the third largest exporter (mainly of soybean oil), with about 7.4% of the world vegetable oil exports by 2029. In all three countries, it is expected that more than two-thirds of the domestic production of vegetable oil will be exported. However, this share is projected to contract slightly in Indonesia and Malaysia as domestic demand for food, oleochemicals, and, especially, biodiesel uses is expected to grow. India is projected to continue its strong growth in imports at 3.2% p.a., reaching 22 Mt by 2029, or about a quarter of world vegetable oil imports, in order to respond to an increasing demand driven by population growth, urbanisation, and increases in disposable income.

The projected growth in world trade of protein meal is around 0.8% p.a. over the outlook period, down from 1.8% p.a. during the last decade, and will be characterised by a declining share of trade in global production. This shift is projected as the global expansion of meat production will be concentrated in the main oilseed-processing countries, where the use of locally-produced protein meal will increase, and thus trade will expand only slightly. Argentina is expected to remain the largest meal exporter because it is the only major protein meal producer with a clear export orientation. The largest importer is the European Union, with imports expected to decline. Almost all of the 8 Mt global import growth in protein meal is projected to occur in Asia, especially in Viet Nam, Indonesia, and Thailand where additional growth will come with the recovery from the African Swine Fever (ASF) outbreak. Domestic crushing capacity in these

countries is not expected to keep pace with protein meal demand, and expansion of the livestock sector is expected to require imported feed to meet production requirements.

4.9. Main issues and uncertainties

The pandemic spread of the COVID-19 has resulted in a reduction of movement with strong implications for away-from-home consumption. This could affect demand for vegetable oil, which is widely used for deep-frying. In addition, the decline in economic activity combined with reduced crude oil price curb the demand for vegetable oil as biodiesel feedstock. Most production and processing of oilseeds and products is highly mechanised and labour mobility is of less importance. Nevertheless, some disruption in palm oil and coconut harvesting due to restrictions on mobility have been reported. In addition, the long-term implications depend on the speed of the economic recovery as vegetable oil consumption per capita grows strongly with economic growth and protein meal is used as feed in the more elastic animal production.

Consumer concerns regarding soybeans stem from the high share of soybean production derived from genetically modified seeds. In the European Union in particular, certification schemes of animal products based on feed free of genetically modified products are gaining momentum and may shift feed demand to other protein sources. Environmental concerns are also on the rise, especially with respect to a potential link between deforestation and increasing soybean production in Brazil and Argentina. These concerns have motivated the private sector to incentivise the use of land already cleared for further area expansions and to refrain from additional deforestation. If successful, these voluntary initiatives should discourage further clearing of land by soybean producers.

The scope for increasing palm oil output in Indonesia and especially in Malaysia will increasingly depend on replanting activities and yield improvements (as opposed to area expansion). In recent years, growth in production has been sluggish given the low profitability of the sector and rising labour costs in Malaysia. There has been some replanting progress by major palm oil companies in Indonesia. Sustainability concerns also influence the expansion of palm oil output as demand in developed countries favours deforestation-free oils and seeks sustainability certifications for vegetable oil used as biodiesel feedstock and, increasingly, for vegetable oils entering the food chain. Several certification schemas operate and are widely used in Malaysia and Indonesia.

Certification schemes, labelling, and environmental legislation might curb area expansion in key palm oil-producing countries and purchases by major importers, which would eventually affect supply growth. These concerns present specific constraints to the further expansion of oil palm plantations and exports of palm oil from Malaysia and Indonesia.

The development of crude oil prices, which affects the profitability of biodiesel production, also remains a major source of uncertainty in the vegetable oil sector. The fastest growth in biodiesel production is expected in Indonesia, but the relationship between palm oil and crude oil prices, as well as economic development can considerably alter the projected growth path. In the European Union, policy reforms and the emergence of second-generation biofuel technologies will likely prompt a shift away from crop-based feedstocks. Biofuel policies in the United States, the European Union, and Indonesia remain a major source of uncertainty in the vegetable oil sector given that about 12% of global vegetable oil supplies go to biodiesel production. In Indonesia, the attainability of the recently proposed 30% biodiesel mandate remains questionable as it may impose medium-term supply constraints.

Protein meals compete in part with other feed components in the production of compound feed and are thus reactive to any change in cereal prices. In addition, changing feeding habits, especially in the cattle sector, can alter the demand for protein meals. Ongoing adjustments in domestic cereal prices in China, for example, will affect the composition of its compound feeds, which currently contain a higher share of protein meal than in developed countries and other major emerging economies. The rate of recovery of

the Chinese pigmeat industry from ASF and COVID-19 will have a large influence on feed demand for livestock as a faster recovery of pig production requires more protein meal for feeding.