

Global dairy directions

Quarterly outlook

September 2019

Introduction

The platform

- **Global Dairy Directions (GDD)** collates an analysis of the short-term outlook for the world dairy market, based on the projected trade in key product groups, and the significance of variables expected to affect that balance over the next two years.
- The work is underpinned by our dairy trade scenario tool, the **Dairy Trade Simulator (DTS)**, which draws on latest detailed trade volumes and prices, expected trends in demand and supply in major countries affecting trade, and the likely shifts in future exporter product mix.

What's new?

Analysis

- There have been a number of important developments in trade taken into account this outlook including implications for changes in product mix from slow milk growth in Europe; changing milk use in China; and the proposed imposition of US tariffs on imports of cheese and butter from the EU
- We have provided further analysis of the key suppliers and markets for fat-filled milk powders, given the changing values of dairy commodities, ahead of (hopefully) better data out of the EU.
- We applied a Monte-Carlo simulation analysis of the effects of combining variations in key assumptions affecting the outlook, added in this edition on page 19.

DTS-Live

- We now offer greater variety in DTS options to suit user needs. There are three versions of the DTS – **Simulator**, **Navigator** and **Insights** - which offer differences in the extent of assumption variability, trade data analysis and drill-down analysis. See our [website](#) for a summary of the features.
- Our **DTS tool is now updated through a cloud server** which enables changes to data as updates are available to us, enabling more timely updates to trade and balance sheet data, as well as assessment of projected valorisations based on daily futures prices.

| Topics | Key contents | Pages |
|----------------------|--|-------|
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| 2. Global outlook | • The outlook - summary and by commodity • Outlook assumptions and their sensitivity • Global trade trends | 7-20 |
| 3. Hot items | • EU milk and product output • Fats: Demand re-ignition? • NZ spring shapes as “normal” • US: tightening with slow milk growth • The slowing world economy • China: How strong is demand? • Developing Asia: more capacity? • Feed supplies remain abundant | 22-31 |
| 4. Regional profiles | • Exporters • Key market regions | 32-38 |
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Our approach

- The GDD provides comprehensive “fundamentals analysis” of the global dairy market, collating supply chain data for the top 11 exporting producers from farm through to wholesale domestic and export commodity markets. The platform maintains commodity balance sheets for major producers.
- A key component of the GDD analysis are **Projected Fundamental Values (PFVs)** for key commodities as a proxy for forward prices, developed as a time series based on physical supply and demand variables. The outlook is updated monthly, providing a rolling outlook for at least two years at any time.
- In undertaking fundamentals analysis in the dairy complex, **forecasts must be made often**, not only due to monthly updates to historical data, but also as global and regional influences on demand and supply are changing constantly.
- The updates to forecasts may alter our views on forward production, product mix and demand assumptions PFVs from month to month, as well as PFVs.

1.1 Highlights

Summary














Analysis

| | | |
|---------------------|---|---|
| World | <ul style="list-style-type: none"> The world milk market will remain tight in the short-term with slow growth in milk output while demand eases from the fast pace earlier in 2019. Milk production growth will increase to 0.7% in Q4-2019 and reach 1% by Q2-2020 The projected balance of trade shows demand will exceed export availability through H2-2019, improving market tension, before weakening in H1-2020. The outlook remains mixed however across major commodity products and regions and are summarized on the following page. | <ul style="list-style-type: none"> Our base outlook scenario is outlined in Section 2 based on assumptions for milk output, product mix, domestic demand and import demand in world markets. See details in the Appendix. This includes important assumptions affecting the projected availability of fresh SMP in the EU which are in turn critical to cheese market fundamentals |
| Products | <ul style="list-style-type: none"> SMP prices will improve faster than our earlier outlooks, taking their lead from EU fundamentals and should continue to steadily firm on reducing stocks, with limited growth fresh SMP supplies. US and NZ prices will follow but subject to their own balance sheet situations, the US delicately balanced with falling output but a loss in trade share. | <ul style="list-style-type: none"> Will capacity in Asian markets be sufficient to absorb the additional SMP output at higher prices? See page 30 |
| | <ul style="list-style-type: none"> While EU butter supplies appear adequate, improving demand (in domestic and export markets) should gradually improve traded prices, although values will be highly sensitive to availability. Oceania fat prices will be influenced by the EU benchmark, but exposed to price-sensitive markets which may reflect the expected global economic slowdown. | <ul style="list-style-type: none"> Will butterfat demand in the EU and developing markets gain sufficient traction to underpin improved prices? See page 24 |
| | <ul style="list-style-type: none"> Cheese markets in the EU should firm with slow growth in milk supply and improving SMP/butter stream returns. US prices will inevitably ease from their giddy heights as domestic demand pushes back and export orders dry up. WMP prices will ease as greater availability comes to the market in Q4-2019 and Q1-2020, influenced by the balancing act between the quality of the NZ production season and the resilience of Chinese demand. FFMP has further eroded some WMP demand in 2019, while expanding Latam output will again limit prices available to NZ and EU product. | <ul style="list-style-type: none"> How much will the NZ industry expand in the current 2019/20 season? See page 24. We explore whether China's resurgent WMP demand is a temporary issue until local milk supplies recover? See page 29 |
| Other issues | <ul style="list-style-type: none"> Some worrying watch points have developed as trade protectionism grows, with potential barriers to EU milk powder exports into large markets of Indonesia and Nigeria | |

1.2 The outlook for commodities

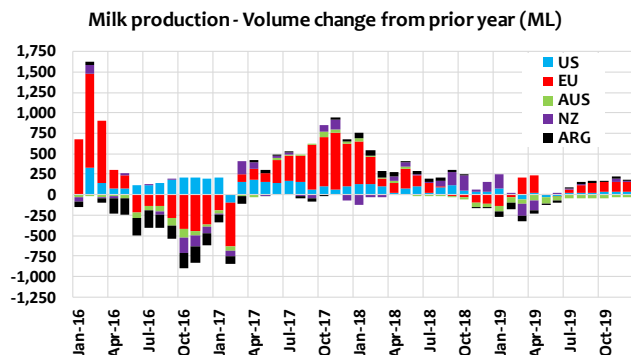
Opportunities and risks affecting the outlook

The table below shows the major product groups and the issues affecting values in the outlook.

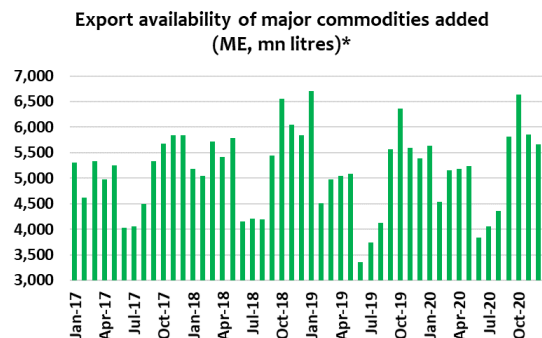
| Product | Current factors | Outlook considerations & watch points | Value direction |
|---------------|--|---|---|
| SMP | <ul style="list-style-type: none"> • Solid demand from Asian markets sustained into Q3-2019 • EU prices slowly improving with tighter fresh SMP supplies • Declining EU stocks • Tighter US NFDN supplies, but taking the EU lead on price • US class prices have re-aligned with stronger cheese prices • NZ premium on GDT and shipped sales | <ul style="list-style-type: none"> • Slow EU milk supply growth, but improving fresh SMP supplies on weak comparatives • Ex-intervention stocks largely depleted • Demand may be constrained in some well-stocked markets • Risk of later demand push-back at higher landed prices in some sensitive markets | <ul style="list-style-type: none"> • EU firm with tight fresh supply. • Oceania will follow trends with a premium to fresh EU product • US will track EU trends, subject to resilience of Mexican demand <p>EU  NZ  US </p> |
| Butter | <ul style="list-style-type: none"> • EU demand gaining traction • Growth in output has been at a faster rate than overall EU milk availability • NZ prices stabilising as export demand re-engages • Weaker global trade, impacted by price-sensitivity in developing regions • US market firm but sensitive to buyer budget pressure and import activity | <ul style="list-style-type: none"> • EU demand improved to steady prices steady at €3,500/t • EU remaining competitive in export markets against NZ in Q3-2019. • Values sensitive to product availability and resilience of demand • Small overall impact expected from the US tariffs • Improving H2-2019 butterfat supply in EU will improve availability • With re-alignment of prices, EU will resume driving butter values • NZ values correcting to fundamentals, and have downside risk with patchy developing market demand | <p>EU: slowly improving, domestic demand growth remains fragile Oceania: steady with improved trade, downside risk above EU benchmark US: tightly supplied but weaker with influence of world prices</p> <p>EU  NZ  US </p> |
| Cheese | <ul style="list-style-type: none"> • Improving EU prices with weak growth in milk supply and firmer SMP/butter stream returns • EU cheddar cheapest on export markets • US cheddar prices surged on limited supplies • Weakening NZ prices on decline in sharp decline in fat prices • Small improvement in global trade | <ul style="list-style-type: none"> • Firming butter and SMP prices in the EU • Weakening EU economy may slow demand • US cheddar output will remain constrained with the milk supply output in some key regions • US domestic demand will push back at high prices, may be vulnerable if consumer spending slows in H1-2020 • Patchy export growth at firmer prices | <ul style="list-style-type: none"> • EU: firmer on SMP/butter stream • Oceania: firm but vulnerable to EU prices in some markets • US: weaker as demand weakens at high prices <p>EU  NZ  US </p> |
| WMP | <ul style="list-style-type: none"> • Softening in prices ahead of peak NZ milk supply • NZ season commenced with tight supplies • Resilient Chinese demand, earlier timing of New Year • Gradually improving availability from Latin suppliers, subject to weather | <ul style="list-style-type: none"> • Tighter overall supply, dependent on strength of NZ milk production • Uncertain oil market may further limit MENA demand • Improving Argentina availability with weaker Peso • Sustained demand from China based on import cost advantages and internal milk use, and affordability in SE Asia | <ul style="list-style-type: none"> • Finely balanced with sustained Chinese demand and small growth in NZ output <p>NZ  EU </p> |
| Whey | <ul style="list-style-type: none"> • Reduced animal feed demand in China and SE Asia due to ASF • US whey powder market has recovered with cuts in output • EU prices pulled lower with weaker overall demand • Improving WPC markets as supply slows | <ul style="list-style-type: none"> • Rising SMP prices offer some scope for switching use • Changing mix of US output as whey prices recover • Improved US whey powder balance sheet • Ongoing rebalancing of market shares (US v EU) into Asian markets • Scope for sustained demand growth in WPC at firmer prices | <ul style="list-style-type: none"> • EU/Oceania: remaining firm • US: steady at current levels, subject to resolution of the Chinese trade dispute <p>US  EU </p> |

1.3 Some key indicators

Milk supplies growth will gradually improve across major producers.

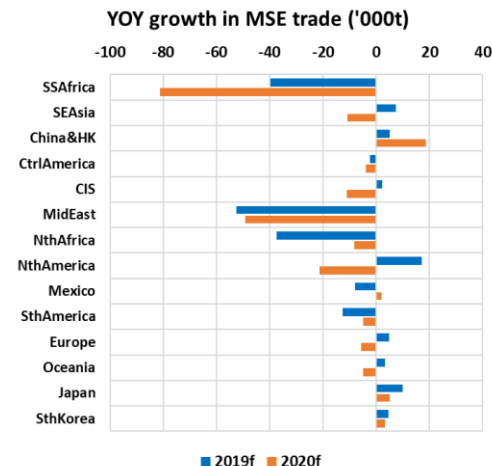


Increased milk production will slowly improve export availability into 2020 after domestic market demand for cheese and ingredients is met

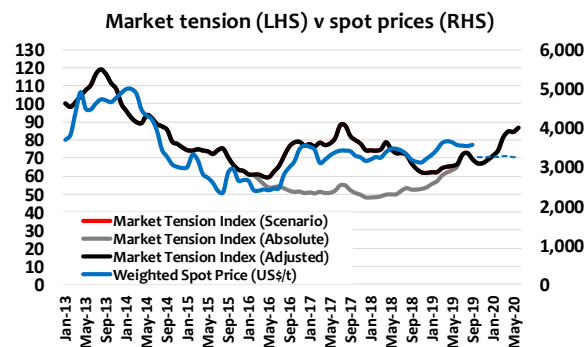


note = the impact of SMP intervention sales is taken into account

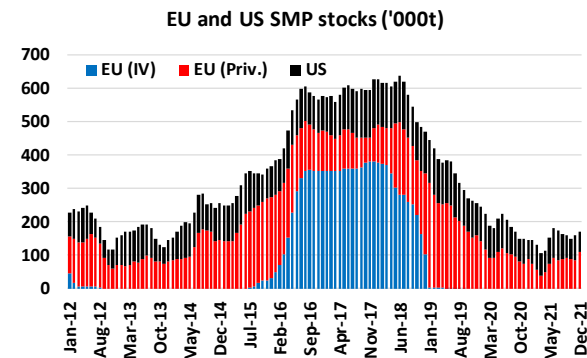
Trade trends remain diverse, but with rising commodity prices, price-sensitive buyers in MENA and Africa have retreated. Our outlook sees slower trade activity in 2020



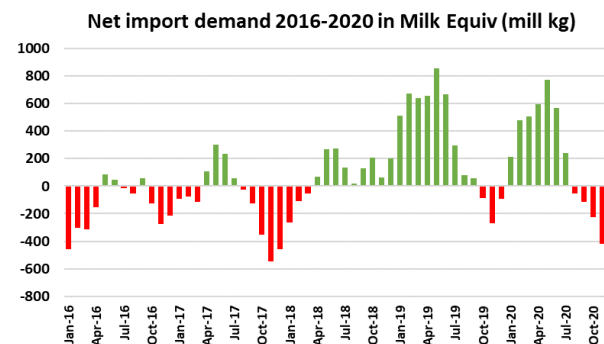
The Base Market Tension Index will weaken as milk output improves and the growth in demand slows.



The wind-down of SMP stocks will continue to be a key influence on protein markets.



Net balance stays in positive territory as demand strips growth in supply



This calculates a rolling average net import demand based on 6 months (including 3 prior months and 2 forward months)

1.4 Hot items affecting the outlook

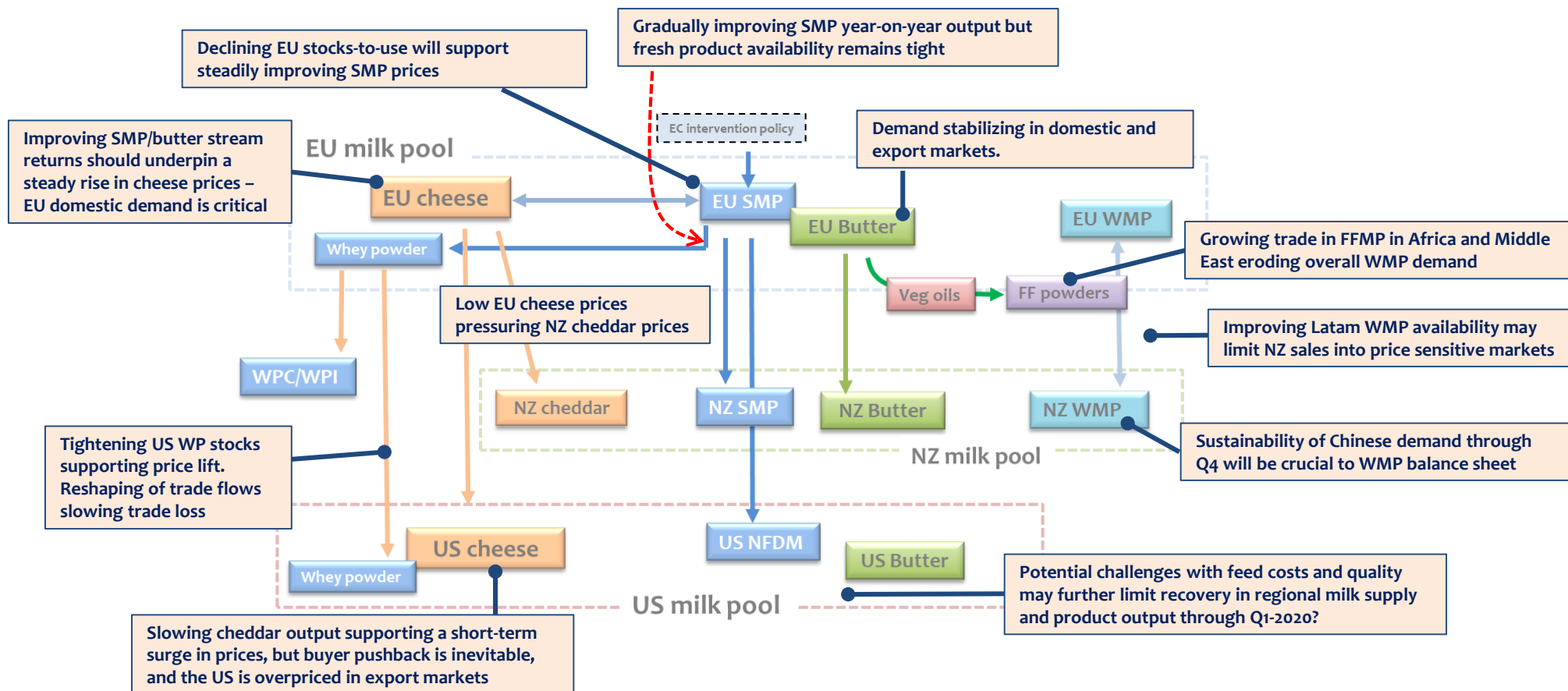
The significant items affecting market fundamentals in the outlook:

| | Hot items..... | ... affecting dairy markets* | ... with likely timing. | | | | | Pages |
|---|---|--|-------------------------|-----------|--------|--------|---------|-------|
| | | | now | 6-12 mths | 18mths | 24mths | ongoing | |
| 1 | How much can the EU grow output? <i>... will a hot summer and rising costs limit recovery</i> | <i>Impacting availability of butter and fresh SMP</i> | | | | | | 21-22 |
| 2 | Butterfat: Demand re-ignition? <i>EU demand is helping, but what of export markets</i> | <i>With SMP prices rising, improving fat prices will underpin improved cheese and WMP prices</i> | | | | | | 23 |
| 3 | NZ: How much peak growth? <i>Higher margins but weather (still) holds the key</i> | <i>Affecting finely balanced WMP and butterfat balance sheets</i> | | | | | | 24 |
| 4 | Tight US milk supply <i>Rising prices, but what can the market bear?</i> | <i>Affecting the already-tight US cheddar cheese and butterfat prices</i> | | | | | | 25-26 |
| 5 | The slowing world economy <i>The combined and growing risks to the world</i> | <i>Affecting future trade and consumer demand in most regions</i> | | | | | | 27-28 |
| 6 | China's import gap <i>Will observed trends drive a bigger role for imports?</i> | <i>Impacting the ongoing requirement for milk powders</i> | | | | | | 29 |
| 7 | Can Asia sustain its milk powder appetite? <i>Can markets absorb more SMP at higher prices?</i> | <i>Affecting ongoing powder demand</i> | | | | | | 30 |
| 8 | Abundant feed supplies <i>Helping improve farm margins</i> | <i>Affecting the rate of growth in milk supply in 2020</i> | | | | | | 31 |

*The relative size of these bars is based on the size of potential **total milk effect** and **impact on projected fundamental values** of variations in assumptions between likely positive and negative scenarios, as per the analyses on **page 18-19**.

1.5 Commodity relationships affecting the outlook

The global market outlook is affected by a complex and interconnected relationships impacting market fundamentals. Some of the hot items outlined on the previous page have direct impacts on these relationships:



This relationship chart is used to represent some of the key underpinnings of our fundamentals analysis for each major commodity group by region.

1.6 Watch points

Further to the preceding demand and supply factors, there are several policy and other wildcards that may significantly impact trade in the short to medium term.

| Summary | | Analysis/impact |
|--------------------------------------|---|--|
| US-China dispute | <ul style="list-style-type: none"> The extended high tariffs will reshape trade and supply chains The impact is expected to slow Asian regional economies China relents on whey and soybean tariffs gives hope for compromise | <ul style="list-style-type: none"> The overall slowing in trade and economic activity is weakening demand for other commodities Higher costs of consumer goods will impact US inflation |
| Brexit | <ul style="list-style-type: none"> Volatile UK political landscape has increased uncertainty as to the potential timing and pathway of a UK exit from the EU – and if it occurs at all | <ul style="list-style-type: none"> There remains a risk of disruption to cheese, butter and bulk milk trade, as well as the flow-on effects on the economy of a potential high tariff regime if no transition deal is struck |
| US-EU airline dispute | <ul style="list-style-type: none"> The US will impose 25% tariffs on EU cheese and butter as part of punitive tariffs on US\$7.5bn of imports from the EU. This will mostly affect Irish and French butter trade, as well as a wide variety of specialty and commodity cheeses. | <ul style="list-style-type: none"> This will slow (but not eliminate) EU exports of butter increasing availability to the EU market. There may be a further impact on some EU cheese producers depending upon the demand response to higher prices of speciality lines in the US. |
| ASF | <ul style="list-style-type: none"> China's sow herd continues to shrink, down 39% in August, and pork (and other meat) prices continued to rise. The government has offered subsidies to rebuild herds supports for expansion of large-scale farms. ASF continues to spread and has reached 11 nearby countries. | <ul style="list-style-type: none"> It is likely up to 60% of China's herd will be culled It will take some time before herd numbers stabilise and start to grow, reducing the market for whey products There is potential for culling of dairy cows to take advantage of rising meat protein prices |
| EU-Indonesia palm oil dispute | <ul style="list-style-type: none"> EU ban on the use of palm oil as a biofuel will weaken the veg oil market If the dispute plays out and Indonesia limits EU dairy trade, this may see some shares of SMP and whey trade alter EU has about 45% of SMP and 75% of whey trade in 2019 into Indonesia. | <ul style="list-style-type: none"> There is close to 80,000t per annum of <u>each</u> of SMP and whey powder at stake We may see shuffling of trade shares in the region, with the US gaining share in Indonesia to offset losing in others |
| Nigerian dairy import ban | <ul style="list-style-type: none"> Nigeria intends to restrict trade credit to importers of dairy (and other foods) to protect local production and support industry development. Largest market in Sub Saharan Africa, grown FFMP imports 15% in H1-2019 to more than 100,000t | <ul style="list-style-type: none"> Nigeria is a key FFMP market and a vital emerging market If enacted, this will close about 15% of the FFMP market, unless grey channels develop. This could shift a significant volume of skim solids back to SMP |

2. Global outlook



Features in this section

The global outlook in summary **9**

The global outlook for commodities **10-17**

Sensitivity to risk factors **18-19**

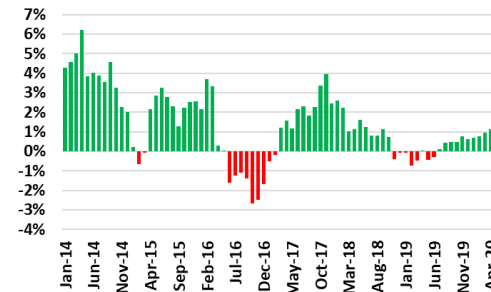
Global trade trends **20**

2.1 Summary

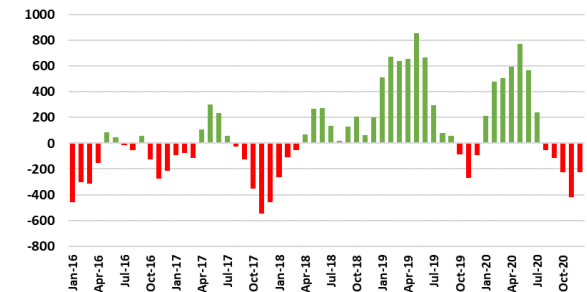
Market trending firmer

- Global milk supply is once again gradually growing but this comes as total trade slows. Adjusting for growth in domestic consumption, the market remains close to balanced.
- The impact of steadily improving milk availability will have varying impact on each commodity group.
- Firmer SMP prices are expected as surplus EU stocks fall, which will coincide with gradually firming butterfat values as demand improves in Europe and developing markets.
- Developing world markets have soaked up large volumes of ex-intervention SMP, which leaves the EU with tighter supplies of fresh skim milk solids. The extent of that supply tightness will depend on Q4-2019 milk production and product mix.
- Fat prices may have bottomed in Europe, although product remains in good supply, ensuring price gains may be gradual. A recovery in demand from developing regions is critical to any recovery.
- World cheese prices have diverged, with the EU cheapest by far in Q3-2019. While improving fat and protein values should eventually support higher EU cheese prices, cheaper EU prices offered to export markets in the short-term may further weaken Oceania prices. US prices surged with short-term shortages in cheddar supplies but are expected to weaken in coming months.
- The slow growth in US milk supply will continue through Q4-2019. Farm margins will gradually improve, but any growth in cow numbers will be limited by rising costs. Production may also be stunted by high-cost/poor quality corn which could clip per-cow yields in Q1-2020.
- The regions that may be most affected by feed challenges are in the upper Midwest, ensuring cheddar supplies remain constrained.
- The global economy faces headwinds with the ongoing uncertainty of economic and dairy trade disruptions from a no-deal Brexit; slowing Chinese and South East Asian economies; rising tensions in the Middle East, and expectations of a US recession in 2020.

YOY milk output growth, top 5 exporters

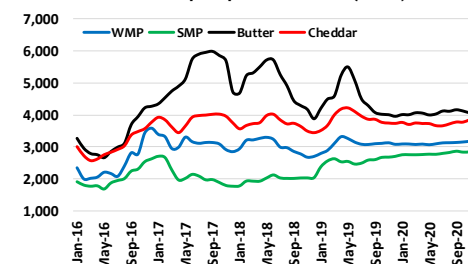


Net import demand 2016-2020 in Milk Equiv (mill kg)

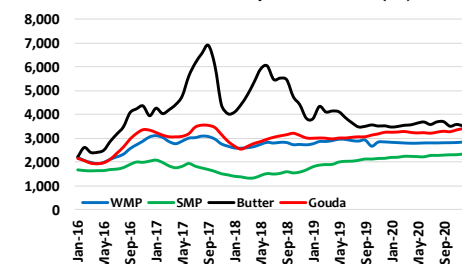


This calculates a rolling average net import demand based on 6 months (including 3 prior months and 2 forward months)

Oceania export prices and PFVs (US\$/t)



EU internal wholesale prices and PFVs (€/t)



See page 18 for the table of projected values[#] for these regions.

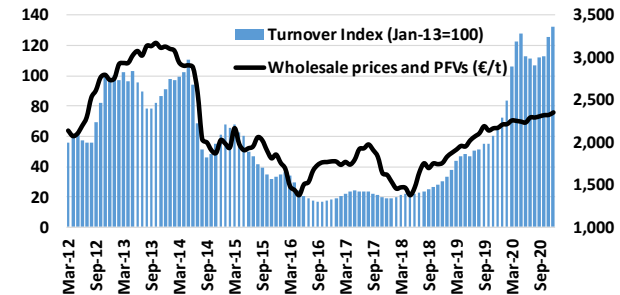
[#]These have been developed using relationships we derived from modelled correlations between material supply variables and spot prices over recent years, using econometric analysis. In each of these cases, the correlations were close to 90% over that period.

2.2 The outlook for commodities

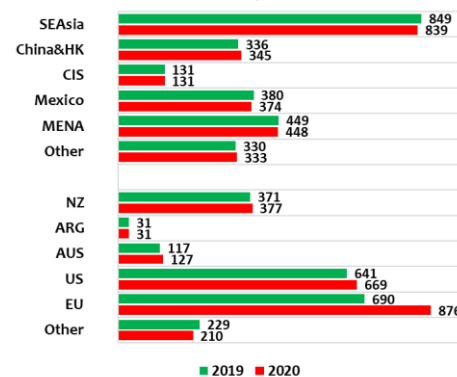
SMP

- **SMP fundamentals are projected to gradually improve with declining exporter stocks.** The recent decline in EU's SMP production with tighter supplies of skim milk solids has held up the EU market
- The key driver of our fundamental values for SMP in the EU is the turnover of stocks, which is projected to improve. The index shown on the right reflects an inverse of stocks-to-use. It has by our assessment improved through Q3-2019 and will continue this trend into 2020.
- While we project improving year-on-year growth in EU milk production over H2-2019, SMP demand will exceed the increase in output.
- The EU - with more than 40% of exports - will remain the SMP price-setter for US and NZ markets, with variations from EU benchmarks dependent on regional balance sheets and any origin preferences for NZ product.
- The US balance sheet has tightened a little with lower NFD/SMP production but demand has also been weaker – the net effect of weaker exports and improved domestic demand. US prices will deviate from EU benchmarks with changes in production, and weaker US butterfat prices will discourage output in coming months.
- While the gap between US Class III and IV prices has been very large, the expected collapse in cheddar prices will narrow the differential and improve the appeal of converting more milk to powder, but any increase in output will depend on where milk production grows.
- Growth in global demand has slowed but key SE Asian markets may have further capacity given past buying trends and landed costs. Chinese demand has been impressive and should remain positive in coming months.
- The EU-Indonesia trade dispute may affect trade shares to the advantage of the US, but is likely to see a reshuffling of shares within the SE Asian region.

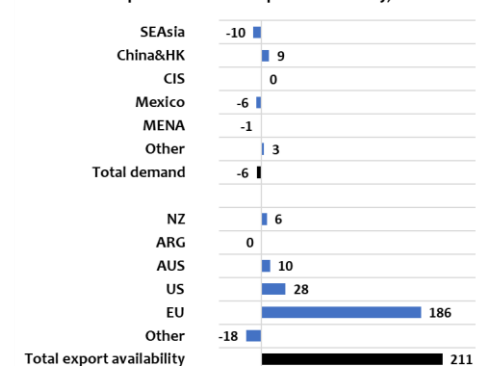
EU-28 SMP stocks turnover index (3-mth rolling avg., LHS) v actual prices and PFVs (RHS)



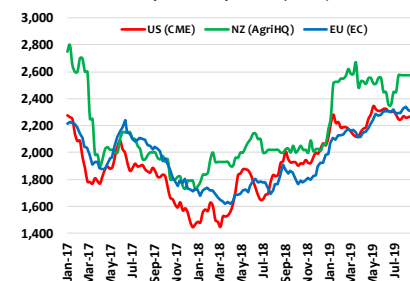
12-month to July, SMP import demand v export availability, '000t



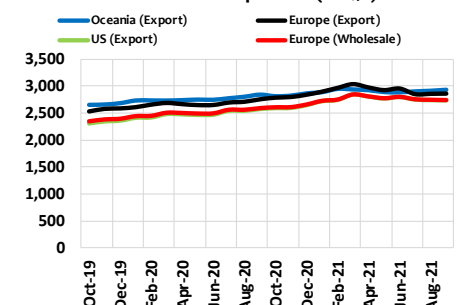
12-month (August 2019 to July 2020) growth in SMP import demand v export availability, '000t



SMP price comparison (US\$/t)



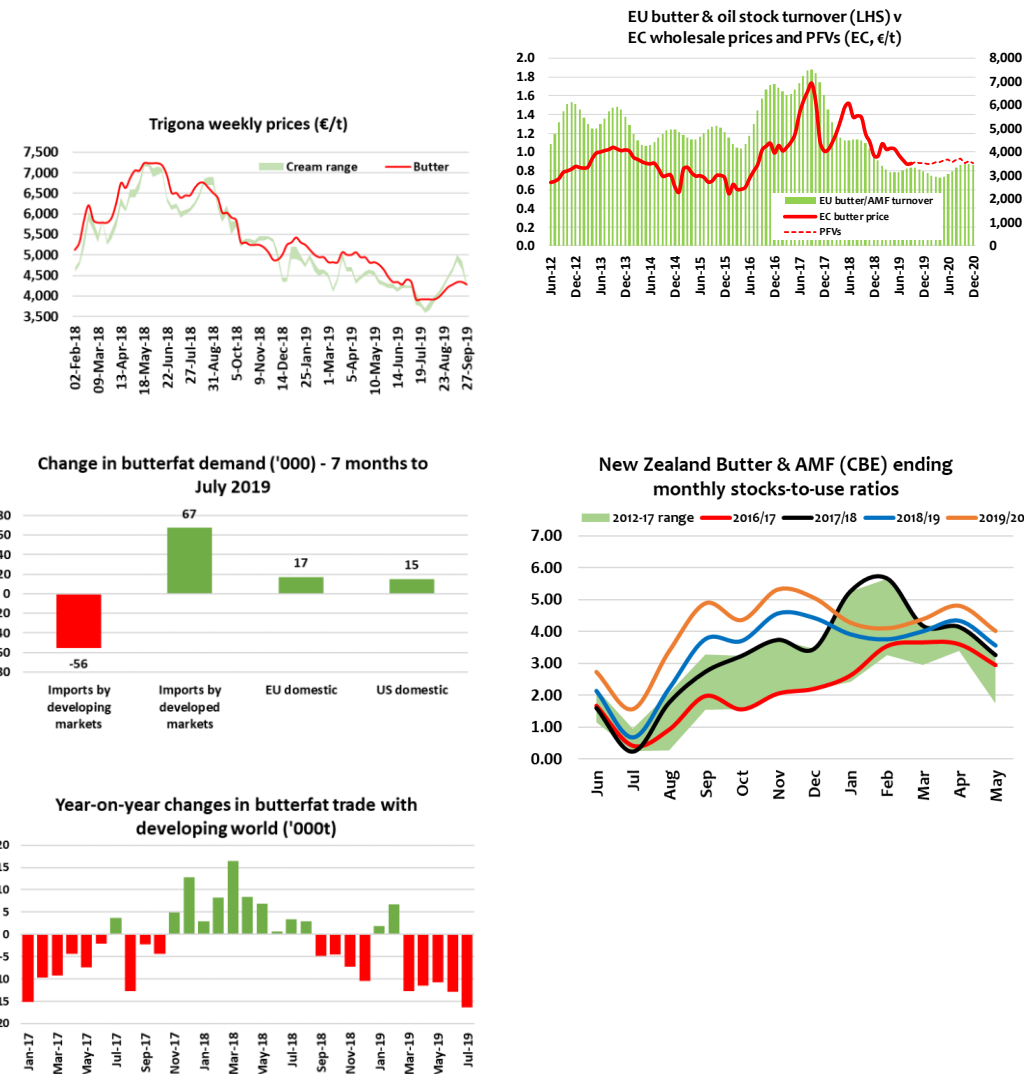
SMP PFVs comparison (US\$/t)



2.2 The outlook for commodities

Butter and AMF

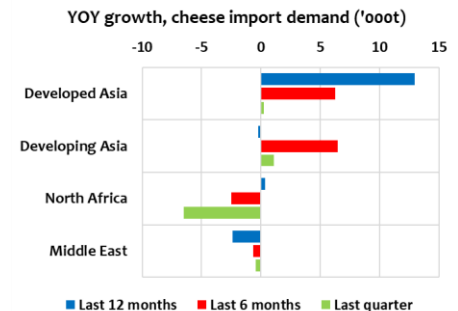
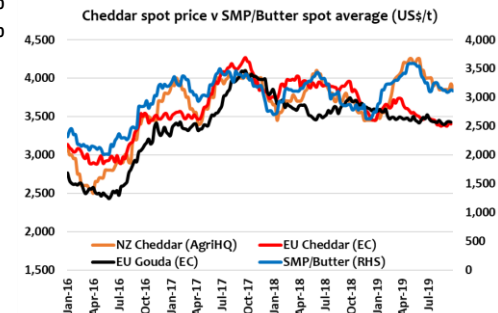
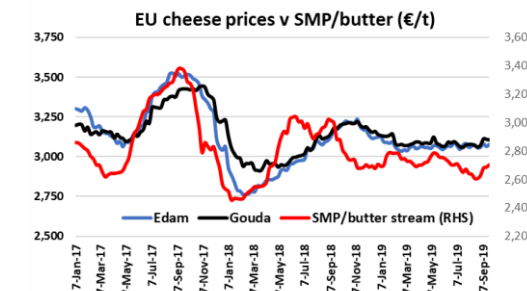
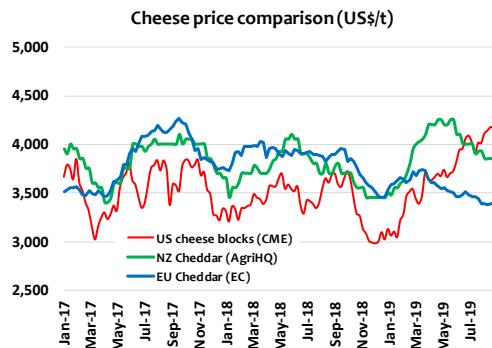
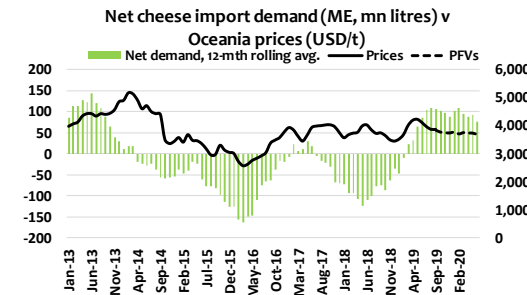
- Butterfat prices have recently gained some traction in EU wholesale markets and GDT events, but we expect will remain fragile.
- Our EU butter fundamentals are based on stock turnover in the internal market which appears balanced in the outlook. This assumes small growth in domestic demand matching improved supply as year-on-year milk growth improves.
- As usual, we have modelled projected EU butterfat availability** from milk output taking account of all uses including butter and AMF. This analysis shows EU monthly butter availability will remain adequate through the rest of 2019 and 2020.
- An update on EU stocks published by the EDA didn't help clarify the picture as they put forward two scenarios for stocks on hand at the end of June – varying by 50,000t! This is explored further **on page 24**.
- Meanwhile NZ butterfat prices have steadied in recent GDT events, with improved short-term cover.
- The global trade in butterfat has been assisted by imports into the US, CIS and Europe. All other regions have seen a significant fall in butterfat trade of 18% year-on-year in the 5 months to July, while imports into developed markets were sharply stronger, with high domestic US prices and fat shortages in Russia.
- Demand from developing markets – which have represented 55% of overall cross-border butterfat trade in the first 7 months of 2019 – should start to recover below US\$4,300/t on past form. This will test whether or not the value threshold has lifted with the greatest acceptance of butterfat.
- Aggregate demand from the global market weakened in recent months, as butter remained 9% and AMF 11% below peak demand reached in 2016.
- The US CME butter market has recently shed close to US\$700/t from the peak in mid-July. Prices have likely been affected by increased imports of butter (into the US) and AMF (into Mexico), while demand is unlikely to be sustained above buyer budget ranges.



2.2 The outlook for commodities

Cheese

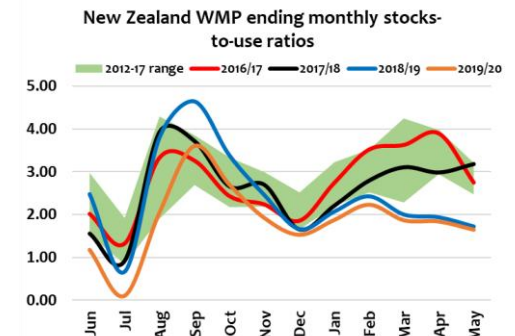
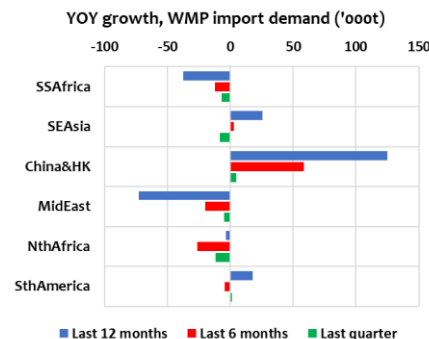
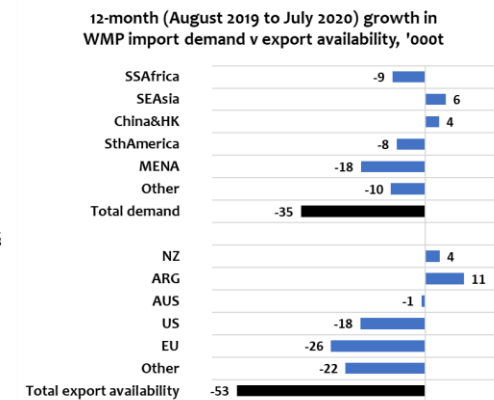
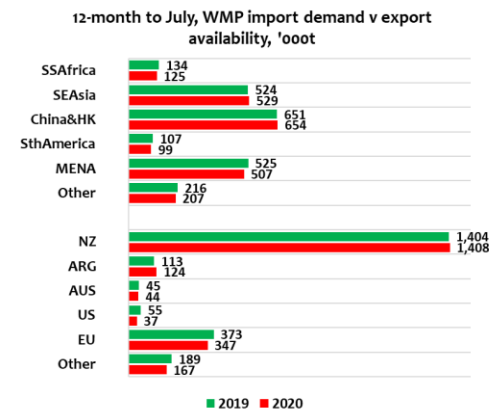
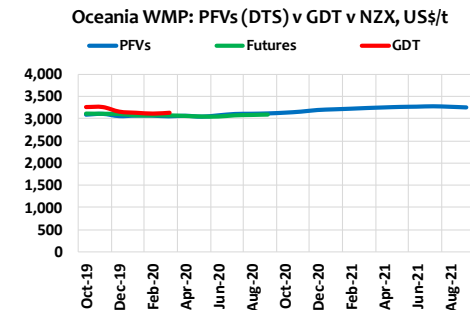
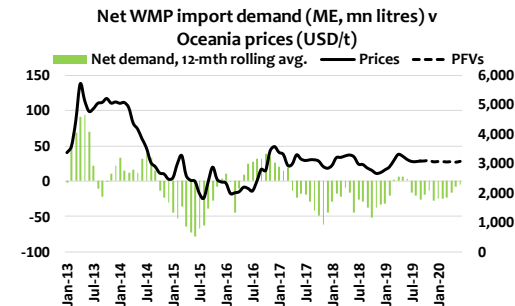
- Cheese prices have diverged significantly since Q1-2019. EU prices slid through Q2 and Q3 as cheese supplies continued to expand and SMP/butter stream returns weakened. Confusion over the timing and mechanism of Brexit may have contributed to some surplus stocks.
- A tightening of the EU market with slower than expected milk growth has helped steady prices since mid-August. Domestic demand in EU markets has been reported as strong while export sales have picked up in latest data.
- The steadying of butter prices in Europe will probably further underpin improved semi-hard cheese prices.
- Prices achieved in export cheese markets retreated with the influence of weaker EU prices.
- At the other extreme, US cheddar blocks weakened after surging to almost US\$5,000/t with weaker regional cheddar output and good demand signals. Prices will quickly burn off buyer interest beyond urgent coverage requirements and will revert to fundamentals based on weaker US domestic demand, weaker exports and improving US milk output.
- Demand in the US has been good but with the economy expected to weaken, cheddar consumption will potentially slow. This may support better fast food cheese demand as consumers trade down to cheaper meals.
- The **growth in global cheese trade slowed** in the 3 months to July 2019 after posting moderate year-on-year gains since Q3-2018. We expect a 2% growth in global trade in 2020.
- In the first 7 months of 2019, CIS imports accounted for half the 3.1% growth in global trade, but demand from developing world markets has weakened in recent months.
- There is a risk of some cheese trade disruption with 25% tariffs applied by the US from mid-October, which may offer slight support to US markets, and displace some milk in affected EU countries.



2.2 The outlook for commodities

WMP

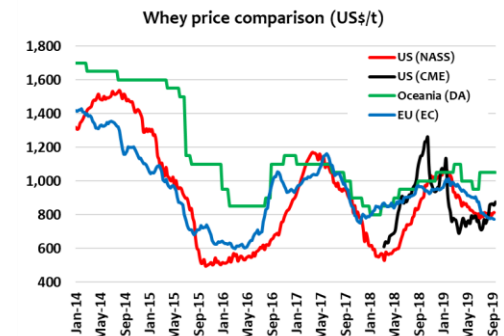
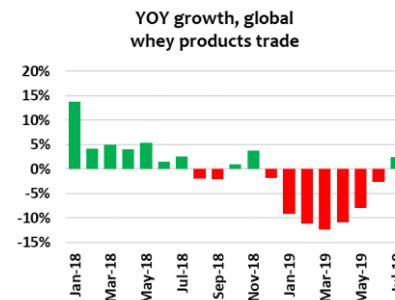
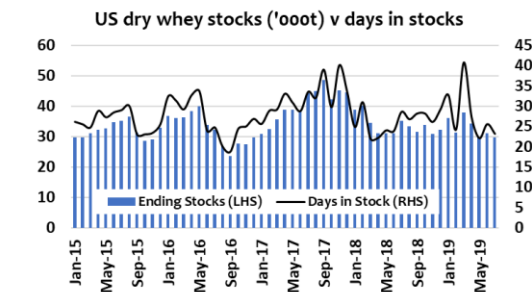
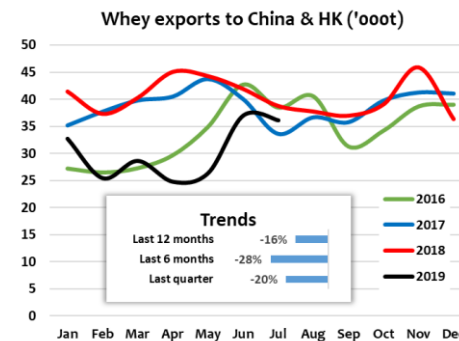
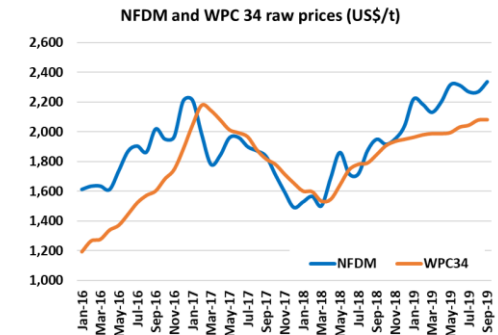
- The WMP market will be finely balanced in the next 12 months
- WMP availability in the next year will be virtually unchanged from the past year, taking account of a small growth in NZ output, improved production in Latam, and similar output in the EU.
- We assume milk growth in NZ will be close to flat in the early season, and improved in the 2nd half. This will grow WMP output by less than 0.5%, as there will be encouragement to improve SMP output with firming returns for the SMP/butter stream.
- It is wise to consider the effect of different scenarios for NZ output in 2019/20, as explained on **page 18**.
- EU production is dependent on customer preferences and it will probably reduce output again as achievable prices will not compete with SMP/butter stream returns.
- Increasing availability of WMP is expected from Argentina and Uruguay as milk production heads into the seasonal peak expected in November. Brazil's appetite for imports is also lower with higher local milk output. With weaker local markets and falling currencies, these producers will again keep pressure on available traded prices.
- The WMP market has contracted, with weaker demand from MENA and Sub Saharan Africa, partly due to the growth in fat-filled milk powder trade. Higher WMP prices and weaker vegetable oil prices in much of H1-2019 widened the gap between WMP and the "shadow" fat-filled value. That gap narrowed with recent weaker WMP prices.
- Asian demand is critical but the effects will probably cancel each other out, and overall demand estimated to be relatively flat in 2020.
- With NZ now holding an estimated 75% share of the trade, the ability for this market to remain balanced is heavily dependent on NZ weather and the resilience of Chinese demand through the peak buying season.



2.2 The outlook for commodities

Whey products

- US prices in the whey complex are the most transparent and continue to drive the values more broadly.
- Dry whey prices rallied with the tighter US balance sheet, after heavy production cuts, but the weight of whey protein availability and ongoing demand contraction from China, due to penalty tariffs and its smaller pig feed market is likely to depress prices. The ASF virus continues to spread and new cases continue to be reported in China.
- US dry whey production fell 11% in the 6 months to July, and will likely continue to contract.
- In theory the outlook for the whey permeate market in China improved with removal of punitive tariffs due to the shortages of feed for pigs on farms that are rebuilding. This may improve the incentive for WPC-80 production but that market remains highly sensitive to oversupply. WPC-80 prices have continued to weaken and will remain so until the fundamentals of the complex improve.
- WPC-34 continues to follow (but lag) SMP prices. While the WPC-34 balance sheet has improved with cuts in production, prices are subdued due to the higher availability of whey solids.
- The EU and US continue to swap trade shares as overall whey product trade worsens – down 7.5% in the first 7 months of 2019 but in the July quarter the decline slowed to 3%. EU exports were flat in the 7 months to July, while the US lost 23%.
- Poor production and trade data (differentiating dry whey from WPC concentrations) prevents meaningful development of global balance sheets, market fundamentals and trading trends for the various protein concentrations.
- We have developed value projections based on fundamentals for Oceania and EU dry whey powders, which weaken in the short-term, before firming later in 2019.

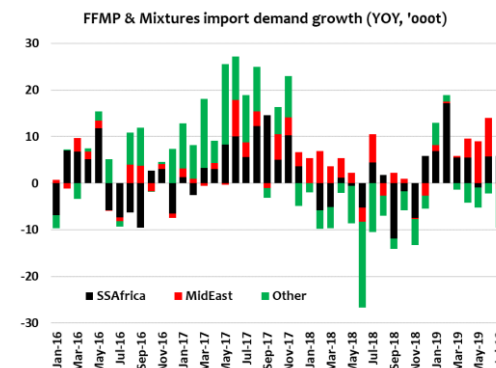
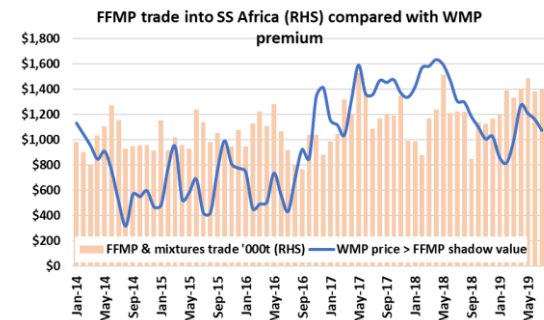
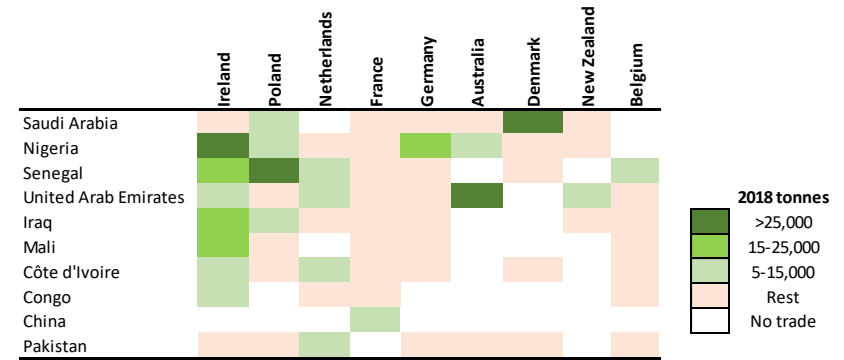


2.2 The outlook for commodities

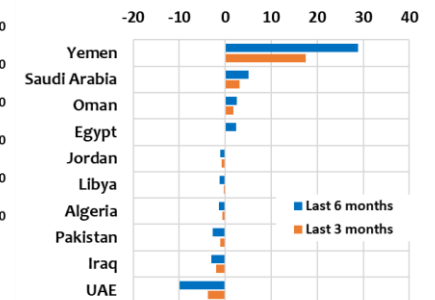
Fat-filled milk powders

- Fat filled milk powders fall within a wider category (HS 190190) which makes it difficult to be precise regarding total trade, while there is no production data for major producers.
- Total trade in the FFMP & mixtures category is 1.6m tonnes, of which the EU ships close to 1.01m tonnes. We estimate total market of true FFMP to be about 700-800,000t, with the key suppliers and market regions shown in the charts and table on the right.
- Rising prices for WMP and sustained low prices for veg oil has driven substitution. The short-term outlook for veg oil prices is discussed on [page 16](#), indicating that prices are not likely to rise
- There has been a 6% lift in trade in the broader category in the first 7 months of 2019, mostly explained by Sub-Saharan Africa and Middle East as per the chart on the right.
- Sub Saharan Africa has grown its overall powder market, with Nigeria and Senegal the stand-out country markets. Meanwhile the Middle East has essentially swapped FFMP for WMP.
- EU dominates trade. Ireland, Poland and Netherlands are the major EU exporters of product with average shipped prices in the apparent price range for fat-filled milk powder.
- It will be interesting to see the impact over time of rising costs of skim-milk solids in the EU accompanying a steadying of butterfat prices. While the oilseeds complex remains in oversupply, economic conditions in price-sensitive markets will dictate the role that FFMP plays in the overall dairy market.
- It will be important to watch what comes from proposals by the EU Commission to improve the transparency of the market through recording of production and trade data will be important developments, if they result in reliable data and insights.

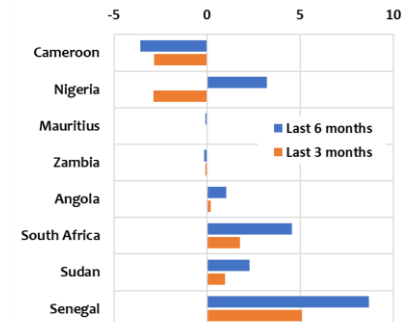
Matrix of Fat-filled trade – suppliers to markets – in 2018



YOY growth, FFMP & Mixtures exports to MENA ('000t)



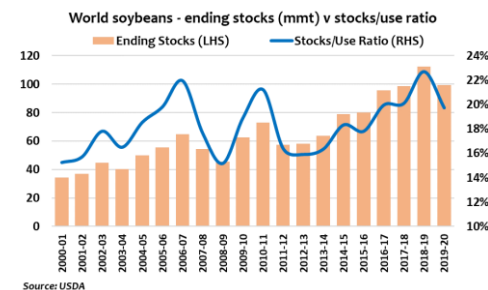
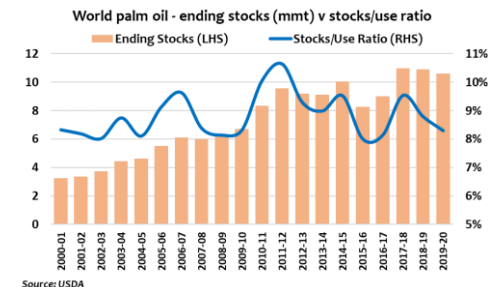
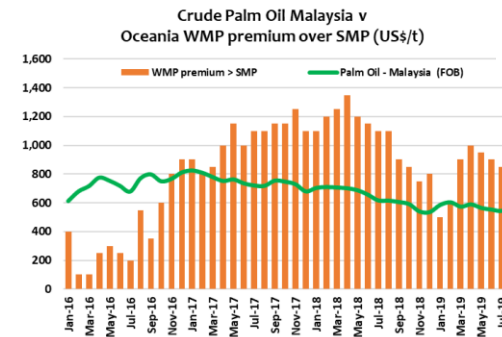
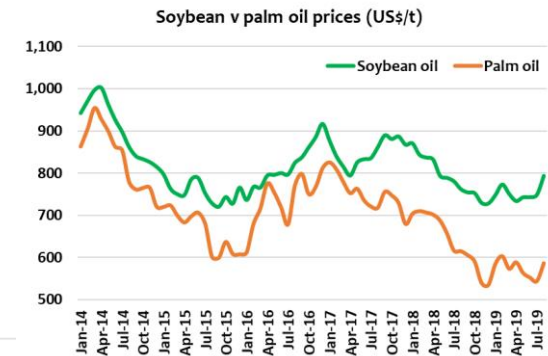
YOY growth, FFMP & Mixtures exports to Sub-Saharan Africa ('000t)



2.2 The outlook for commodities

Competing oils

- The market outlook for soybean and palm oil remains highly relevant to dairy markets and more interesting with recent increases in vegetable oil prices and the projected narrowing gap between SMP and WMP prices.
- Crude palm oil (CPO) prices have improved a little from close to 10-year lows led by soybean oil. Prices have weakened since early 2017 due to the combined effects of higher output and reduced demand, but the recent price rally may be short-lived.
- Palm oil's outlook is more troubled with sustainability concerns limiting demand in Europe. In the short-term at least, the effects of the US-China trade dispute are impacting demand, while the outlook for supply has improved in the absence of an El-Nino event which reduced last year's production.
- The outlook for the oilseed complex is not helped by the flat outlook for crude oil prices.
- The EU-Indonesia trade dispute over the proposed banning of the use of palm oil as a biofuel would nominally affect 10-15% of Indonesia's biofuel exports. Indonesia and Malaysia are taking a number of measures to defend demand for their crops.
- Global stocks-to-use for **both palm and soybean oils** are expected to fall from prior year levels which may also provide some price support in 2020.
- The latest balance sheet outlook from the USDA sees total oilseed production falling 3.5% in 2019/20 which will take stocks 12% lower in by Q3-2020. Oil production will however lift 2%.



2.2 The outlook for commodities

This table provides a summary of the project fundamental values for key product series.

| | -----Oceania export (US\$/t)----- | | | | | -----EU internal wholesale (€/t)----- | | | | | | --EUR export (US\$/t)-- | |
|--------|-----------------------------------|-------|--------|---------|-------|---------------------------------------|-------|--------|-------|-------|------|-------------------------|-------|
| | WMP | SMP | Butter | Cheddar | Whey | WMP | SMP | Butter | Edam | Gouda | Whey | WMP | SMP |
| Oct-19 | 3,099 | 2,658 | 4,025 | 3,773 | 996 | 2,663 | 2,136 | 3,566 | 3,151 | 3,152 | 796 | 3,195 | 2,532 |
| Nov-19 | 3,117 | 2,664 | 4,012 | 3,751 | 1,000 | 2,832 | 2,161 | 3,520 | 3,201 | 3,202 | 804 | 3,181 | 2,579 |
| Dec-19 | 3,068 | 2,689 | 3,961 | 3,740 | 1,003 | 2,839 | 2,168 | 3,529 | 3,271 | 3,272 | 816 | 3,194 | 2,588 |
| Jan-20 | 3,079 | 2,738 | 4,015 | 3,772 | 1,004 | 2,822 | 2,206 | 3,477 | 3,271 | 3,272 | 814 | 3,175 | 2,611 |
| Feb-20 | 3,078 | 2,739 | 4,011 | 3,707 | 1,001 | 2,810 | 2,212 | 3,502 | 3,281 | 3,282 | 815 | 3,156 | 2,657 |
| Mar-20 | 3,063 | 2,738 | 4,072 | 3,754 | 1,004 | 2,795 | 2,254 | 3,552 | 3,303 | 3,304 | 817 | 3,143 | 2,688 |
| Apr-20 | 3,075 | 2,744 | 4,061 | 3,736 | 996 | 2,784 | 2,249 | 3,569 | 3,263 | 3,264 | 809 | 3,126 | 2,666 |
| May-20 | 3,056 | 2,755 | 4,004 | 3,734 | 988 | 2,786 | 2,240 | 3,643 | 3,242 | 3,243 | 803 | 3,129 | 2,649 |
| Jun-20 | 3,084 | 2,751 | 4,035 | 3,670 | 984 | 2,796 | 2,230 | 3,690 | 3,253 | 3,254 | 803 | 3,157 | 2,651 |
| Jul-20 | 3,114 | 2,780 | 4,127 | 3,666 | 983 | 2,799 | 2,290 | 3,584 | 3,228 | 3,229 | 797 | 3,160 | 2,696 |
| Aug-20 | 3,119 | 2,807 | 4,119 | 3,724 | 982 | 2,797 | 2,289 | 3,696 | 3,276 | 3,277 | 804 | 3,157 | 2,710 |
| Sep-20 | 3,126 | 2,846 | 4,167 | 3,783 | 984 | 2,804 | 2,303 | 3,705 | 3,311 | 3,313 | 809 | 3,181 | 2,755 |
| Oct-20 | 3,142 | 2,817 | 4,127 | 3,779 | 979 | 2,807 | 2,317 | 3,511 | 3,293 | 3,294 | 804 | 3,184 | 2,785 |
| Nov-20 | 3,165 | 2,828 | 4,067 | 3,856 | 981 | 2,814 | 2,320 | 3,588 | 3,369 | 3,370 | 817 | 3,193 | 2,797 |
| Dec-20 | 3,200 | 2,869 | 4,035 | 3,928 | 986 | 2,833 | 2,349 | 3,526 | 3,426 | 3,426 | 825 | 3,235 | 2,840 |
| Jan-21 | 3,215 | 2,892 | 4,065 | 3,933 | 987 | 2,835 | 2,409 | 3,433 | 3,423 | 3,424 | 823 | 3,237 | 2,896 |
| Feb-21 | 3,229 | 2,952 | 4,035 | 3,944 | 984 | 2,838 | 2,429 | 3,421 | 3,426 | 3,427 | 822 | 3,240 | 2,966 |
| Mar-21 | 3,244 | 2,942 | 4,145 | 4,014 | 992 | 2,848 | 2,499 | 3,532 | 3,485 | 3,486 | 831 | 3,267 | 3,035 |
| Apr-21 | 3,256 | 2,927 | 4,165 | 3,931 | 975 | 2,849 | 2,467 | 3,443 | 3,385 | 3,386 | 811 | 3,267 | 2,972 |
| May-21 | 3,268 | 2,894 | 4,151 | 3,915 | 964 | 2,849 | 2,438 | 3,565 | 3,363 | 3,364 | 805 | 3,267 | 2,924 |
| Jun-21 | 3,273 | 2,889 | 4,222 | 3,960 | 964 | 2,855 | 2,447 | 3,653 | 3,398 | 3,399 | 809 | 3,288 | 2,954 |
| Jul-21 | 3,281 | 2,906 | 3,959 | 3,888 | 947 | 2,854 | 2,408 | 3,578 | 3,315 | 3,316 | 792 | 3,284 | 2,849 |
| Aug-21 | 3,271 | 2,918 | 3,823 | 3,928 | 944 | 2,845 | 2,400 | 3,715 | 3,361 | 3,362 | 799 | 3,270 | 2,856 |
| Sep-21 | 3,257 | 2,936 | 3,895 | 3,895 | 933 | 2,843 | 2,383 | 3,563 | 3,313 | 3,314 | 788 | 3,280 | 2,860 |

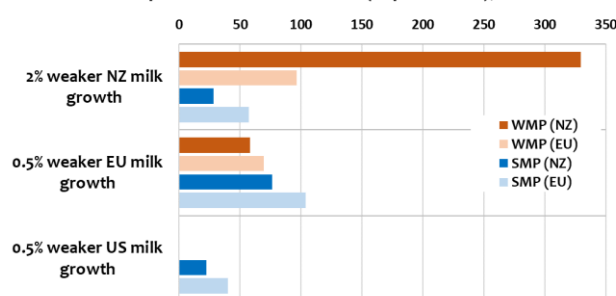
- To derive monthly PFVs, we use an econometric multiple regressions approach. Separate equations are estimated across region/product pairs based on historically available information on supply and demand variables sourced from public sources and own estimates.
- Historical actual price data sources: Oceania export PFVs are based on the AgriHQ weekly series (except whey – Dairy Australia); European internal wholesale PFVs projections are based on the weekly EC/Kempton series; EU export PFVs are based on USDA Dairy Market News series and internal market PFVs on CME series.

2.3 Sensitivity to risk factors

Sensitivity of projected values

- This outlook for market fundamentals is sensitive to a number of factors affecting the market balance, which are outlined in **Section 3**.
- The charts on the right show the **sensitivity of the projected fundamental values** of dairy commodities (as an indicator of potential price impacts) based on changes in key variables used in our DTS simulation tool.
- These rely on projection formulae we have developed from recent pricing trends and influences. The projected impacts of changing outlook variables differs between regions, based on what has typically driven recent historical commodity price movements.
- The variables influence values differently over time – this analysis however provides a guide as to sensitivity and materiality to change. These changes are shown as positive to prices – the same negative impact on prices will apply to assumption changes in the opposite direction.
- We have run specific scenarios on changes to EU and US milk supply and product mix as shown on the bottom right, with varying impacts on product prices.

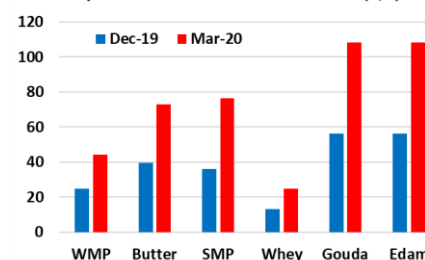
Impact on March 2020 PFVs (export series), USD/t



2019 milk impact by scenario (bn litres)

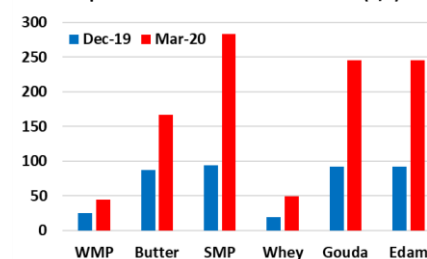


Impact on EU internal market PFVs (€/t)



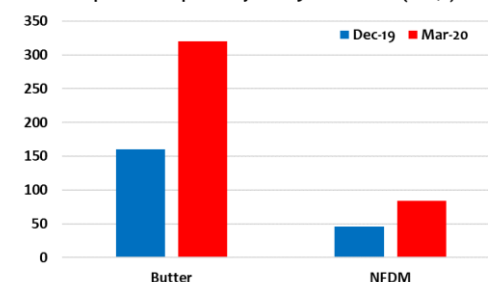
EU milk 0.5% changed but no change in product mix

Impact on EU internal market PFVs (€/t)



EU milk 0.5% changed but cheese output remains fixed, additional milk goes to SMP and butter

Impact on US prices by Dec-19 and Mar-20 (US\$/t)



US milk 0.5% changed but cheese output is unchanged to match domestic demand, added milk goes to NFDM and butter

| Assumption | Base outlook | Variation cases (see chart at right) |
|----------------|--|---|
| NZ milk supply | Milk production grows 1.1% over 2019/20 No change in % mix of milk use | +/- 2% from September 2019 through to May 2020 |
| EU milk supply | 2H-19 growth of 0.8% 1H-20 growth of 1.1% No change in % mix of milk use | +/- 0.5% from September through to the end of Q2-2020 |
| US milk supply | 2H-19 growth of 0.4% 1H-20 growth of 0.8% No change in % mix of milk use | +/- 0.5% from October through to the end of Q2-2020 |

2.3 Sensitivity to risk factors

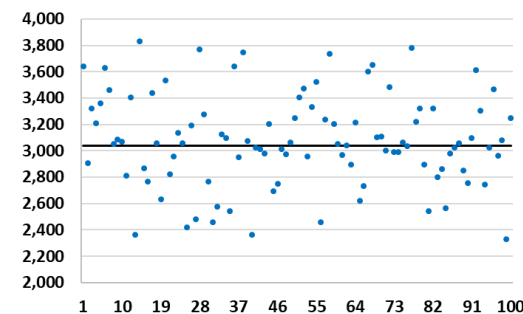
Monte-Carlo analysis

- As a new feature in this quarterly report, we conducted a Monte Carlo multivariate analysis using our DTS-Live to estimate the potential impact on Oceania and European milk powder prices by the end of Q4-19 and Q1-20 from any potential upward or downward variations in the base outlook.
- This statistical method relies on a computation algorithm that draws on 100 randomly generated samples of pre-selected supply and demand variables as detailed in the table on the right. All results from a Monte Carlo model are typically compared against a risk tolerance level, in this case based on our outlook for global dairy markets and potential for swings in key assumption factors.
- This procedure allows for an overall probability distribution to be developed in order to assess the risk of all possible outcomes under the stochastically simulated assumptions.

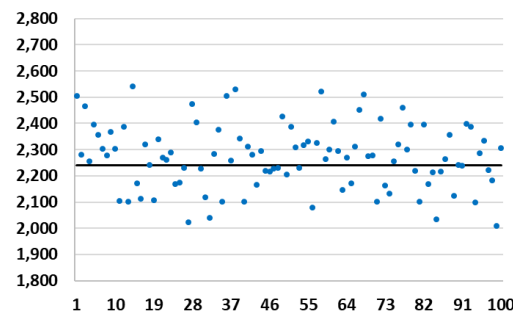
| Variable | Variation from base outlook (Sep-19 to Mar-20) |
|----------------------|--|
| NZ milk production | -2% to +2% (0.5%-point increments) |
| EU milk production | -0.5% to +0.5% (0.5%-point increments) |
| China & HK WMP trade | -10% to +10% (5%-point increments) |
| SE Asia SMP trade | -10% to +10% (5%-point increments) |

- On average, our results show that ending Q1-20 Oceania WMP export PFVs are US\$3,037/t – US\$40/t below the base-case scenario. Out of all generated results, 45% fell in the US\$2,800-3,200/t range. The most positive (for prices) scenario yields a result of US\$3,829/t, driven by significantly weaker milk production in NZ but also the EU, in addition to stronger import demand for milk powders in China & HK and SE Asia.
- For European SMP, out of all generated ending Q1-20 PFVs, 80% fell in the €2,100-2,400/t range. On average, the results show that ending Q1-20 European SMP wholesale PFVs are €2,272/t – €30/t higher than the base-case scenario.

Oceania Mar-20 WMP export PFVs (US\$/t)



EU Mar-20 SMP wholesale PFVs (€/t)



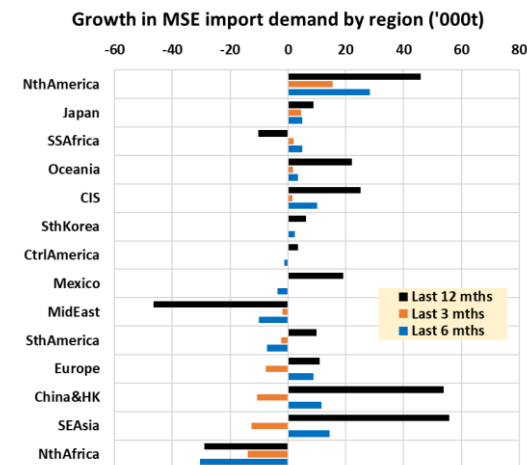
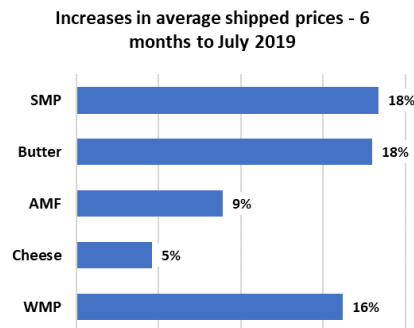
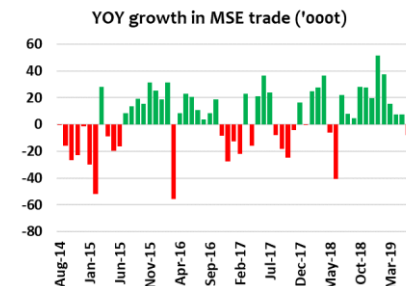
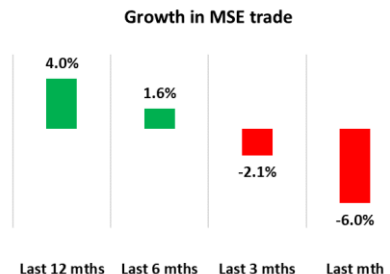
| Lowest PFV (change from base) | Highest PFV (change from base) |
|-------------------------------|--------------------------------|
| • NZ milk +1.5% | • NZ milk -2% |
| • EU milk +0.5% | • EU milk -0.5% |
| • China WMP -5% | • China WMP +5% |
| • SE Asia SMP -10% | • SE Asia SMP +10% |

| | Unit | Lowest PFV | Highest PFV |
|--------------------------------------|--------|------------|-------------|
| Oceania export WMP ending Q4-19 PFVs | US\$/t | 2,612 | 3,526 |
| Oceania export WMP ending Q1-20 PFVs | US\$/t | 2,328 | 3,829 |
| EU wholesale SMP ending Q4-19 PFVs | €/t | 2,035 | 2,308 |
| EU wholesale SMP ending Q1-20 PFVs | €/t | 2,010 | 2,542 |

2.4 Global trade trends

Trade activity has slowed

- Global trade slowed in July, inevitably losing momentum since the peak early in 2019. July exports fell 6% YOY in milk solids equivalent (MSE) terms, the 2nd month of decline, despite SMP trade continuing to expand.
- Overall trade was dragged lower by large declines in WMP and fats trade as prices lifted, while cheese exports were flat year-on-year after weakening in June. Trade in whey and lactose each posted a slight increase in July after 5 months of falls.
- The July decline reduced trade in MSE terms for the quarter to July to 2.1%.
- Imports into North America provided the largest absolute expansion in trade (in MSE terms) in both the 3 and 6-month periods to July.
- After the major Asian regions drove much of the recovery in trade in the first half of 2019, shipments to China and South East Asia were lower in the July quarter compared to a year earlier.
- Prices have lifted strongly across most commodities driven by tighter balance sheets. The table on the right shows the average price changes in the 6 months to July.
- Butter prices have moved most in recent months, with much of the gain booked in the 3 months from April – as NZ prices leapt 20% to burn off demand while EU export prices drifted lower but remained higher on average.



3. Hot items

Features in this section

EU milk and product output **22-23**

Fat demand – re-ignition **24**

NZ – spring shapes as “normal” **25**

US market tightening **26-27**

The slowing world economy **28**

China: How good is demand? **29**

Developing Asia: more capacity? **30**

Feed supplies remain abundant **31**

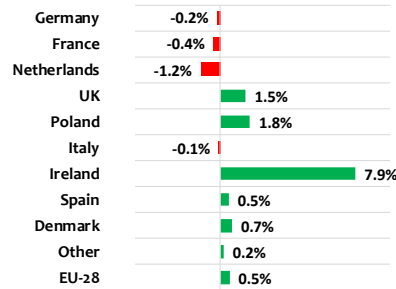


3.1 EU milk and product output

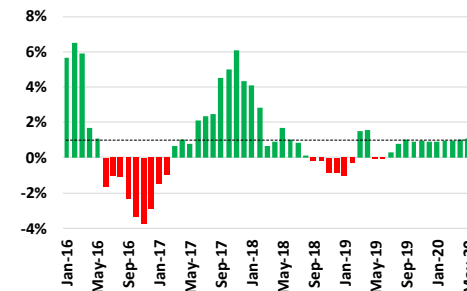
Milk growing again

- The growth in EU milk collections has remained weaker than expected with lower herd numbers and challenging conditions in several major regions.
- There have been soil moisture deficits in large areas of France, Germany and Poland.
- Milk prices have been held in the 35-36c range by larger companies in Netherlands and France, but are weaker for processors in Germany, Ireland, Poland and Scandinavia with greater commodity exposures. Pressures on milk prices will alleviate gradually in Q4-2019 with improving butter and SMP stream returns.
- Our calculated EU Commodity Milk Value has gained 2c since mid-August to be close to 32c in late September.
- **Farm margins will however remain relatively favourable. Corn prices** have weakened with the abundant supply in EU and global feed markets despite some weaker yields, while wheat prices have increased slightly in September (despite bumper harvests in Europe and Russia) but remain relatively cheap. Hay prices vary widely due to differences in conditions.
- Cow numbers fell in most regions according to the Eurostat survey as shown, which will limit milk growth.
- After July output increased slightly (0.3%), we estimate growth in milk collections built to 1% in September, mostly due to the weaker 2018 comparatives. Milk solids output has grown faster than milk volume since May – due to weak comparatives with the feed challenges of last year. This adds to the increase in manufacturing milk solids availability. Growth in key countries will vary across the bloc, as shown in the chart on the right.
- We have revised our growth assumptions for major producers as shown on the right, which results in a 0.8% growth in milk output in H2-2019 and 1.0% in H1-2020. However, it remains prudent in considering risks in the outlook to consider scenarios at 0.5% higher or lower than these outlooks given the wide variation in conditions across the region.

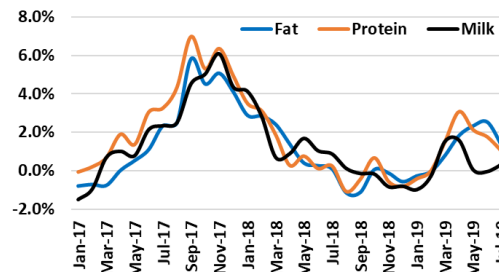
2019 milk output growth



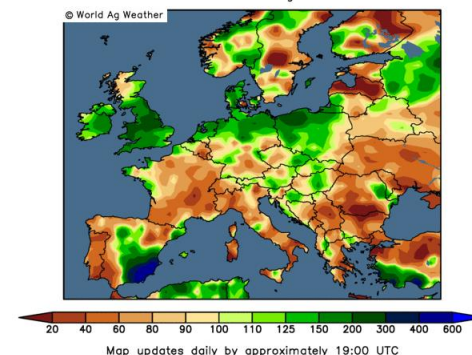
EU-28 monthly milk output, YOY growth



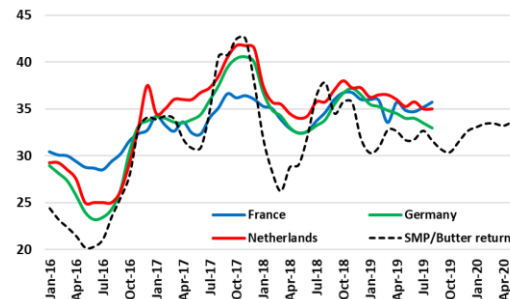
YOY growth in EU fat and protein output



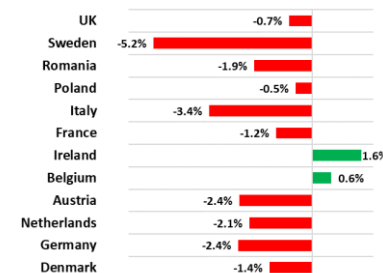
30-day Precipitation Analysis
Percent of normal through 1 Oct 2019



EU milk farmgate prices v SMP/butter returns lagged 2 months (€/100kg)



Dairy cow numbers YOY growth
May-June 2019 survey

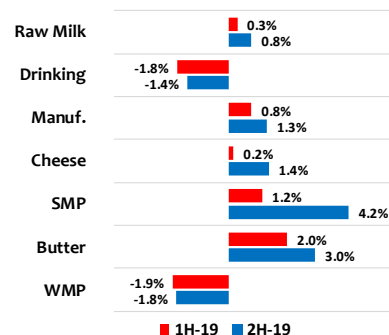


3.1 EU milk and product output

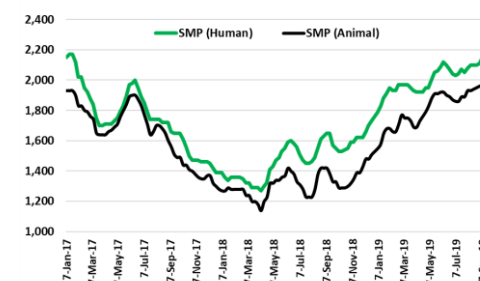
Wholesale markets drive the world

- Milk use across the EU's product mix will be critical in coming months with the projected steady depletion of SMP stocks and the tentative improvement in butterfat fundamentals.
- Slow milk growth, and optimisation of cheese output has shortened supplies of skim milk solids across competing uses, with demand for fresh SMP reported to be good, but with growing exports of FFMP and increasing feed sector demand for fresh SMP product. Feed-grade SMP prices have risen strongly after depleting ex-intervention supplies.
- We have updated our projected EU manufacturing milk use in major commodities, based on expected milk production through mid-2020, and the appropriate product mix scenarios, given the variability of product use in major countries.
- Butter demand has gained some traction and steadied prices – even rising according to wholesale quotes, bringing producers confidence that they've seen the bottom. However recovery will be fragile.
- The imposition of US tariffs on butter imports from the EU will (after front-loading effects) potentially add to EU supplies.
- SMP output will lift 4.2% in H2-2019, and then by 7.6% in H1-2020 in our base scenario based on the varying pace of milk growth and likely product mix across the bloc. The estimates of EU butter and SMP stocks in June have been taken into account in our analysis.
- Cheese prices may start to improve with improved fat and protein values as well as an expected lift in exports.
- There is some downside risk with a slowing European economy, led by an industrial slump in Germany, with potential disruptions to trade from a no-deal Brexit, which remains a risk given the political chaos in the UK.
- Food retail sales remain positive, but the indicators relevant to consumer spending may weaken.
- We assume cheese consumption (based on a disappearance calculation) will grow by an average 1.0% in 2020, after achieving growth of 1.3% in 2019.

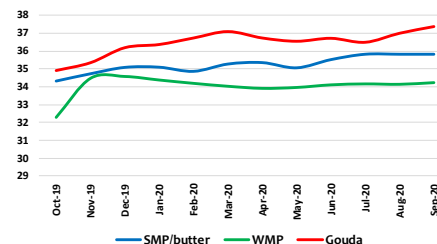
YOY growth in EU output



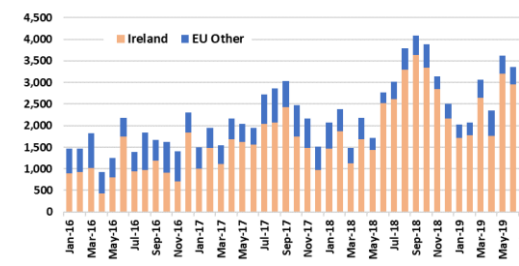
Dutch wholesale prices (€/t)



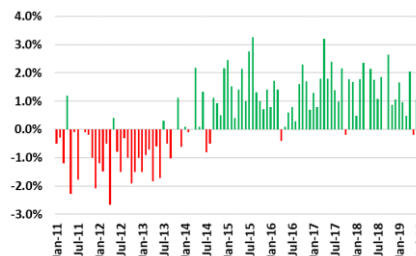
EU gross stream returns (c/kg)



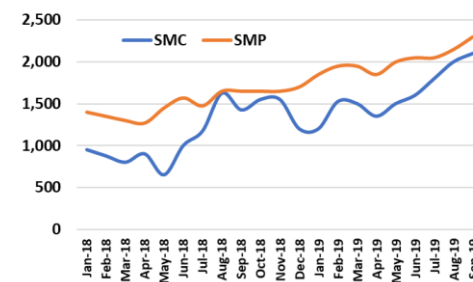
EU monthly butter exports to the US (t)



YOY growth - index of deflated turnover - retail sales of food, beverages and tobacco (Euro area)



European quotes (EUR/t)

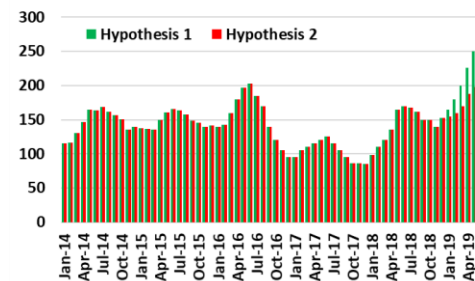


3.2 Fat: Demand re-ignition?

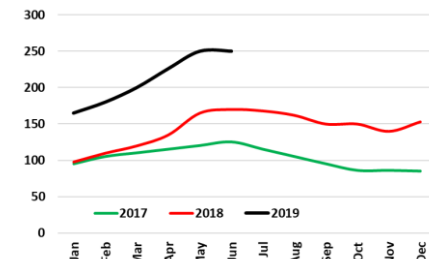
Rebalancing the market

- There are positive signs that the butter market has bottomed in Europe and that fundamentals could improve as demand gains traction at more affordable prices.
- The situation in the EU butter market is however far from clear, and the absence of reliable product output data remains a major challenge to providing a sound basis for assessing market fundamentals.
- This was the reason behind the EDA reporting two butter stock scenarios for June 2019. We have adopted the higher number in our EU butter balance sheet (June stocks of 250,000t) based on the risk of underestimation reported by EDA, which accorded with our expectations. Prior to this EDA report, we had assessed expected June stocks at 252,800t in our August outlook.
- The chart on **page 11** shows the realignment of our smoothed measure of butterfat stock turnover and wholesale prices. The updated stocks situation showed imputed domestic consumption (disappearance) of butterfat increased 1.8% over the prior year in H1-2019, but was insufficient to prevent a stock-build as production grew faster, imports increased and exports declined.
- We have projected the EU balance sheet forward assuming 2% growth in domestic demand.
- EU prices will remain sensitive to changes in regional milk supply and butterfat availability in the short-term outlook.
- Developing world trade weakened in the 3 months to July as prices hiked. Trade into these markets should recover somewhat in Q4-2019 with the recent falls in Oceania prices, when we expect shipped prices to fall below US\$4,300/t.
- We have run two scenarios for EU butter using our DTS-Live to reflect different outlooks for butter output and domestic demand growth.
- Assuming 0.5%-point stronger milk production to the end of Q2-20 (and keeping cheese production flat), EU wholesale butter PFVs in June 2020 are about €200/t stronger than the base-case scenario.
- In the alternative case, EU domestic consumption of butter is 1%-point stronger to June 2020 – here, June 2020 PFVs are about €100/t stronger than the base.

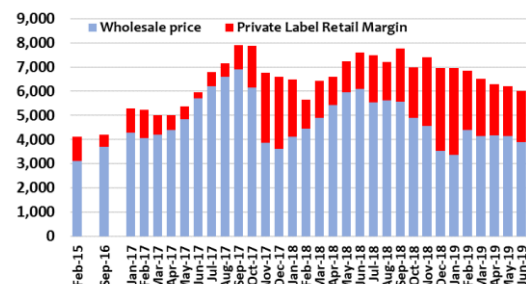
EDA butter stocks estimates ('000t)



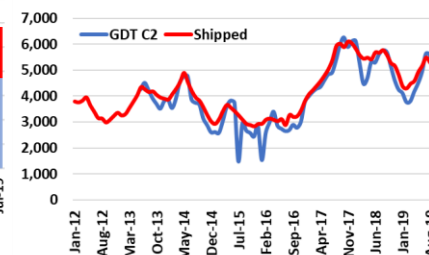
EDA "hypothesis 1" butter stocks estimates ('000t)



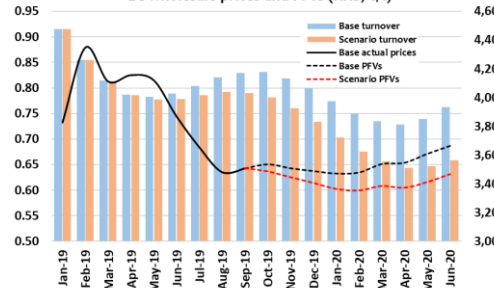
German wholesale v retail butter prices (€/t)



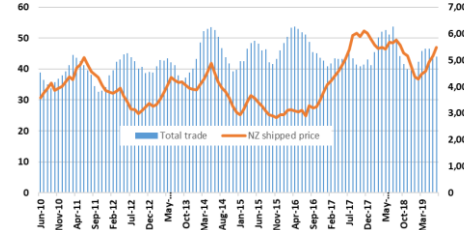
NZ butter shipped (FOB) v GDT 3m lagged C2 prices, US\$/t



EU butter & oil stock turnover (LHS) v EC wholesale prices and PFVs (RHS, €/t)



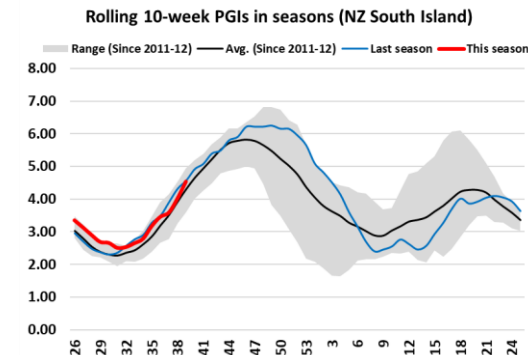
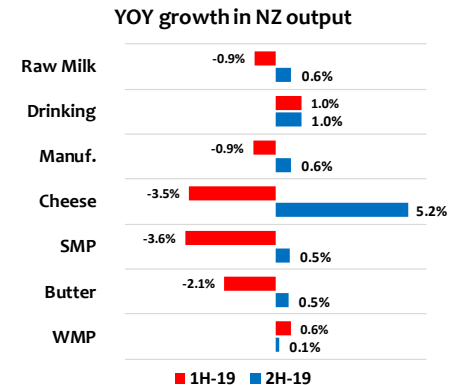
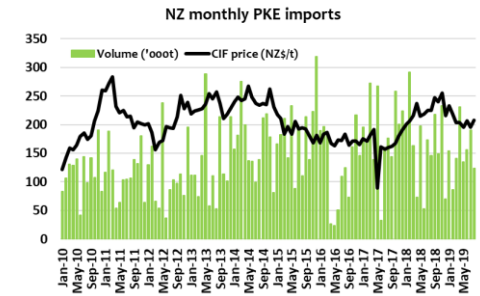
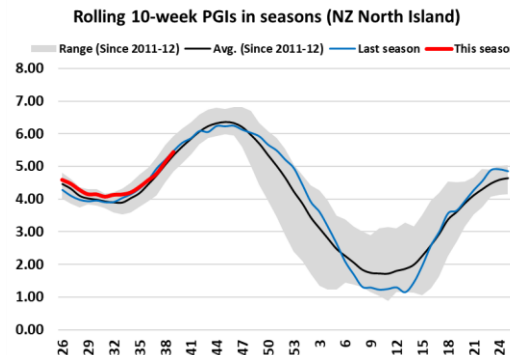
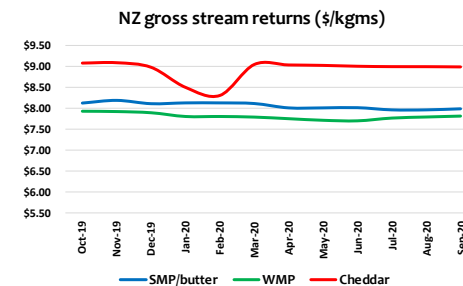
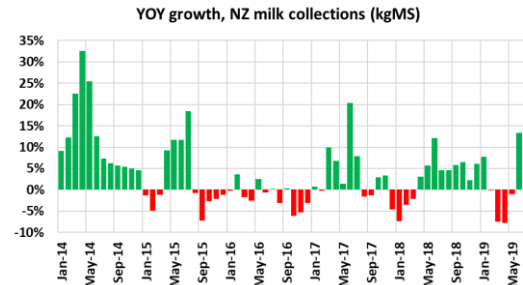
Rolling 6-month butterfat trade with developing markets (LHS '000t) v NZ shipped butter prices (US\$/t)



3.3 NZ: spring shapes as “normal”

Close to a normal spring expected

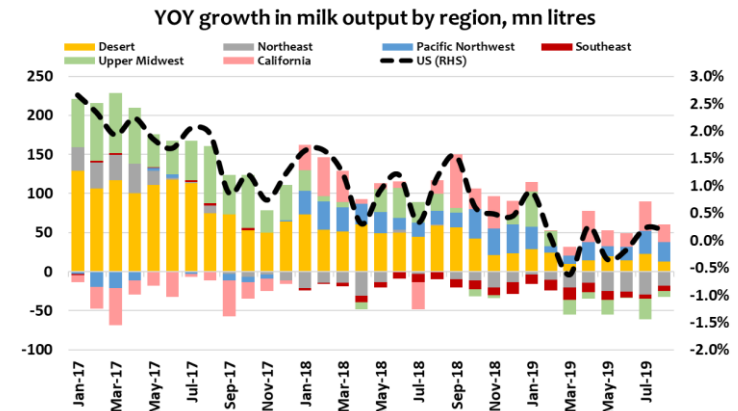
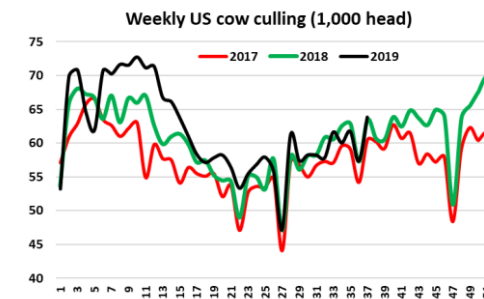
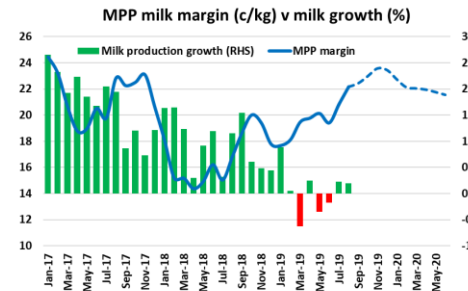
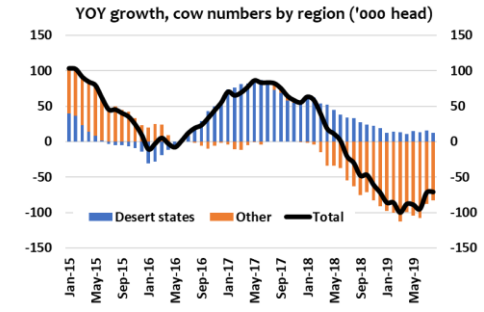
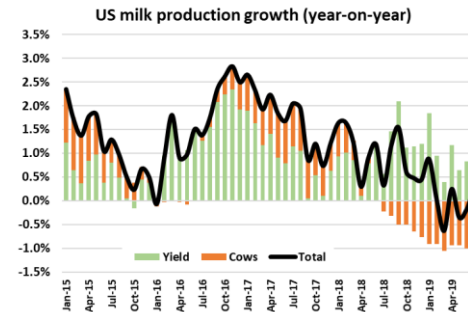
- Pasture growth indicators in most regions point to normal or superior growth rates for the this time of year.
- Conditions are generally more favourable in the North Island, while the bottom half of the South Island was a little dry in late September after a cold and wet start.
- Some of the influences on NZ weather might come from southern Australia which is expected to dry out in Q4-2019. Higher regional grain prices from Australian suppliers may discourage extended milking later in the season.
- With GDT results and the PFVs from our analysis, we estimate that Fonterra's milk price outlook (based on the reference formula) will be in the range NZ\$7.00 to \$7.10/kgMS, while a dividend should be forthcoming from Fonterra in 2019/20.
- It is interesting to note higher PKE imports in the past few months, despite the disincentives in place. Higher grain prices from Australia may explain this trend.
- We expect 1.1% growth in milk production over the current season, flat in the first half against an exceptional start to last season, better gains post-peak compared to the weak finish from a partial drought.
- Sentiment has been battered with the poor financial position of Fonterra, and water management policy proposals from Government. The latter is a longer term impact on seasons to come, but it has weakened sentiment to a 10-year low, which may limit the willingness of producers to chase production even with a higher milk price.
- The NZ product mix is not expected to significantly alter, with first half mix prioritising WMP, but the situation for SMP supplies will be an interesting setting in H1-2020. If US and EU fresh SMP availability remains tight and butter demand has recovered, there may be a shift away from WMP.
- The assumed product output changes are shown on the right.



3.4 US: tightening with slow milk growth

Weak milk growth persisting

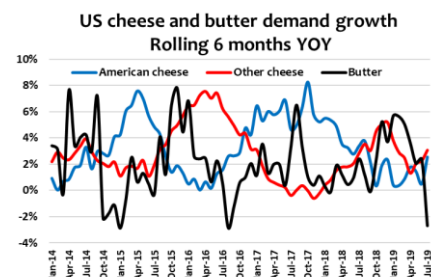
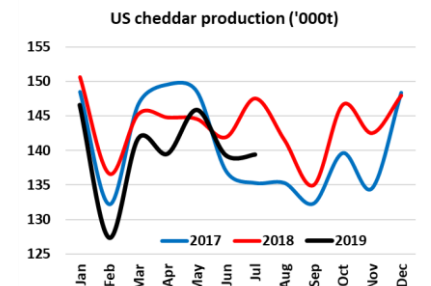
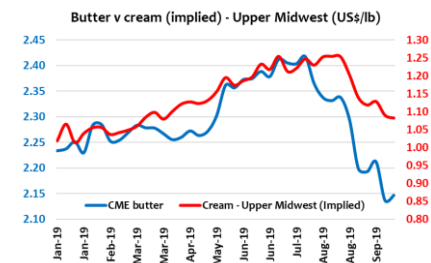
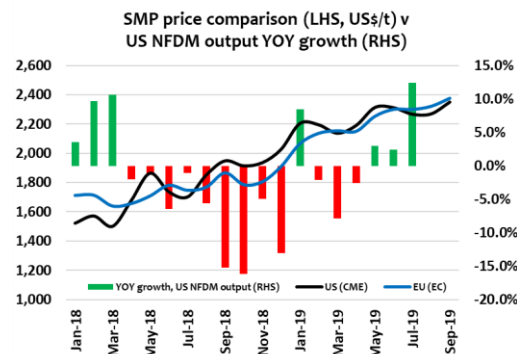
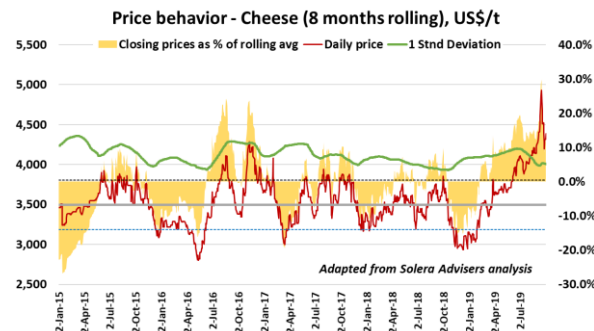
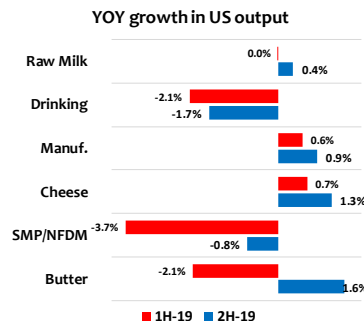
- Milk supply in H2-2019 will expand slowly despite improving prices and farm margins.
- Farm margins are expected to improve strongly through Q4-2019 as shown by the MPP projections in the chart on the right, before the arrival of more challenging feed conditions.
- However the milk supply outlook will remain diverse across regions, with persistent growth in the south-west, improving output in the Upper Midwest and contraction east of the Mississippi.
- The unknown lurks in the corn crop, with a chorus of doubt that USDA estimates on overall yields and quality are reliable. Quality deficiencies will more likely show up in Q1-2020 per-cow yields. Corn prices leapt in response to a USDA revision of corn stocks in late September, which suggests volatility in prices will continue until crop outcomes are more certain.
- A poor crop yield will directly impact those growing their own feed in the upper-mid-west, but the higher feed costs will be first felt by total mixed ration producers buying in feed in the south west.
- That is not the only feed headache. Hay tonnages and quality will also be reduced.
- There is little change expected in cow numbers despite improving farm economics. Trends in heifer prices might indicate some greater demand for restocking which will start to reverse the trend.
- Culling has slowed, but still tracks 3.3% ahead of the prior year to week 37. Cow numbers continued to fall through to the end of August to 9,318m head.
- The impact on milk production is expected to keep growth flat to 0.5% up through Q4-2019 and into Q1-2020.



3.4 US: tightening with slow milk growth

Tight cheese and powder market

- Weak milk growth will ensure the expansion in manufacturing milk supply remains close to 1%. With domestic cheese demand likely to be stronger than this, US dairy product markets should remain tight.
- Cheddar fundamentals are strongly supportive of prices with declining milk supplies in the upper-mid-west driving production lower, while demand has improved according to USDA disappearance data. Solid domestic cheese demand has been sustained by household spending and improved sales in the cheese-friendly segments of food service.
- Days in stock fell in July before the surprising lift in stocks in August which suggested slower demand.
- Despite the recent market slump, further demand pushback against high prices is inevitable in orders for early 2020 retail sales. Prices won't be sustained above US\$3,800/t into Q2-2019 given buyers' budget expectations – especially if consumer spending weakens as widely expected in H1-2020. Export sales will also be curbed with much weaker EU and NZ prices on offer.
- The tighter milk and product supply will ensure the US remains uncompetitive in butterfat trade, but it may invite higher imports if NZ prices weaken further.
- The US butter market will remain sensitive to overall butterfat availability and has been pressured somewhat by imports of AMF to compete with cream.
- With the projected outlook for product mix in H2-2019, NFDN/SMP will remain in tight supply. The EU will also dictate market fundamentals, which should see a continued steady lift in US prices. The NFDN balance sheet has been helped by a recovery in the domestic manufacturing use.
- Mexican demand is likely to wane with higher prices, and exports to other regions may improve with the exhaustion of stocks of cheap EU product.
- Our product mix assumptions are shown on the chart on the right. SMP/NFDN and butter output will not grow in the next 9 months with the assumption of overall mix use favouring cheese output.



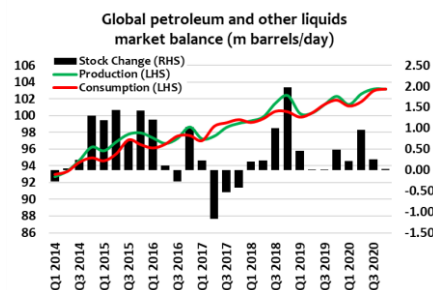
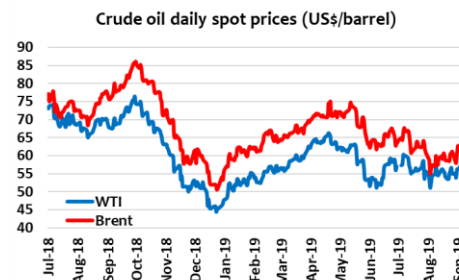
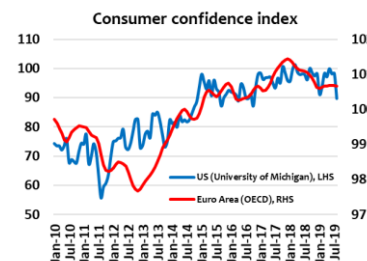
3.5 The slowing world economy

Does a recession loom?

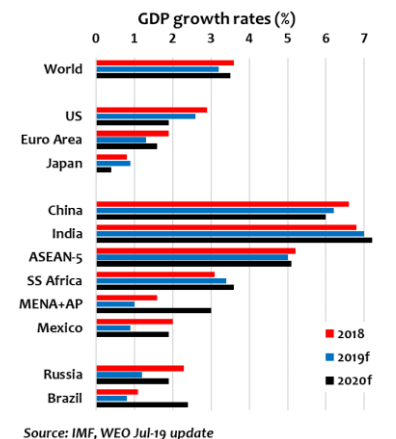
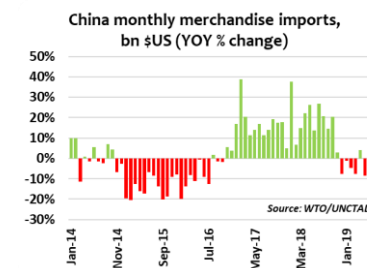
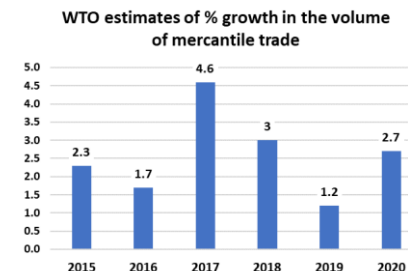
- There are just as many economic analysts arguing the case to support a global recession in 2020 as there are denying the likelihood.
- There are many undeniable conditions and indicators that suggest growth in the US, Eurozone and some key developing economies will be threatened in the next year.
- Slower world trade due to the US-China trade dispute; the risk of a no-deal Brexit; weakening manufacturing activity (especially in the US and Germany); uncertainty affecting investment yields; and weaker business and consumer sentiment add to the risks of a broad slowdown.
- The impact on dairy and related commodity markets comes down to which economies are more exposed to the changing conditions. Domestic EU and US domestic consumption remain the most important to the balance of global trade, although as we so often see, the resilience of much smaller dairy trade volumes is a key determinant of volatility.

Outlook for oil

- Weaker world economy growth and slower trading activity will help keep crude oil prices weaker, affecting economic growth and consumer spending in oil-dependent dairy markets in MENA and West Africa. This outcome is also supported by the expansion of low-cost US shale oil output which is offsetting the effects of production cuts by OPEC.
- Persistent flare-ups in geopolitical tensions have sustained a steady upward trend in prices.
- In their September outlook, IEA sees weak oil market fundamentals remaining unchanged, supporting generally stable prices through 2020 at similar to 2019 averages.
- Despite the steadying of growth in major economies in MENA, we are not seeing much change in price sensitivity in dairy trade. While oil prices have tracked higher, overall revenues flowing into oil-producing economies have been reduced by lower output.



Source: EIA, June 2019 short-term outlook

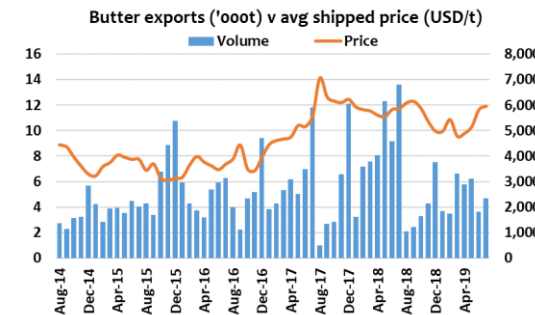
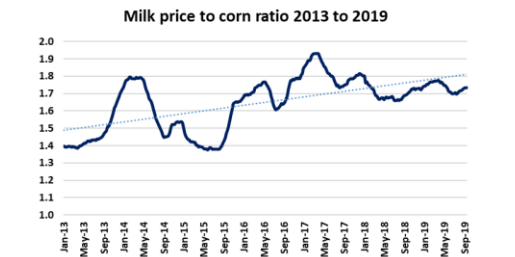
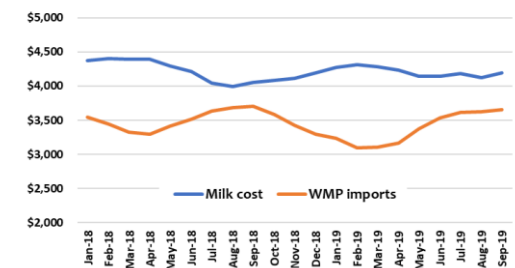
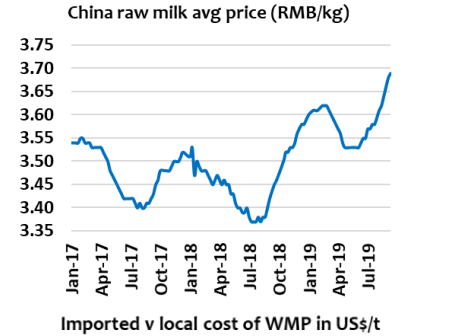
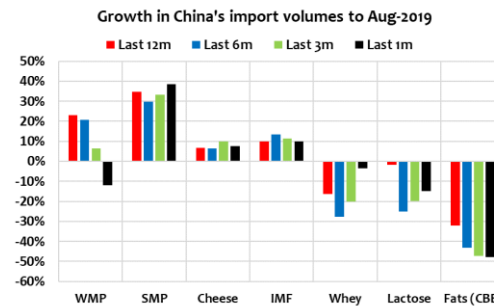
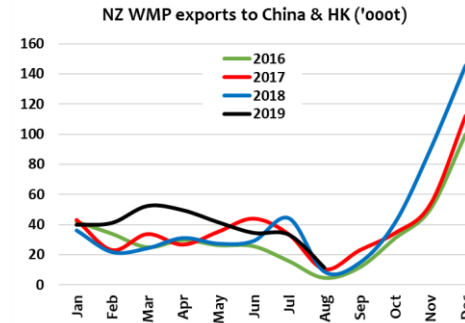


Source: IMF, WEO Jul-19 update

3.6 China: how strong is demand?

Weaker milk output and changing use driving a larger import gap

- Our monitoring of available data and anecdotes suggests the following:
 - Chinese milk supply is growing slowly.
 - Rising farmgate milk prices indicate tighter milk supplies.
 - Major fresh milk companies indicate (in recent public disclosures) the need to continue to invest in the growth of milk supply through elevated prices for the next 2-3 years
 - More milk is being pulled into fresh product use, and milk powder output is falling
 - More powder ingredients are being used to produce short shelf-life products
 - Locally-produced infant formula brands are improving market share, requiring more base ingredients such as SMP
 - Higher local milk prices make imported products more competitive.
- This is combining to increase the import requirement for WMP and SMP. WMP stocks have declined, despite import demand running 22% higher than the prior year. Over the full 2019 year, we expect import WMP growth of 18%, which implies growth in H2-2019 imports of just 4%. This is an opaque market however, and we encourage participants to consider alternate scenarios on **page 18**.
- In July 2019, SMP stocks were elevated compared to a year earlier, but are lower than 2017. Usage in the Chinese market was estimated to be 21% higher in 2019.
- We have assumed SMP demand will nonetheless slow somewhat in Q4-2019 and grow 5% in 2020.
- Milk production growth is expected to slow to 0.25% in H2-2019. Corn prices have increased and are expected to continue to firm, although the milk price to corn ratio has recovered in the past few months with rising milk prices. Opportunities to cull dairy cattle to supplement protein supplies remains a threat to milk production in the coming 2 years.
- Import demand for infant formula remained far slower in recent months, growing 3.6% in the 7 months to July as local brands improved performance.

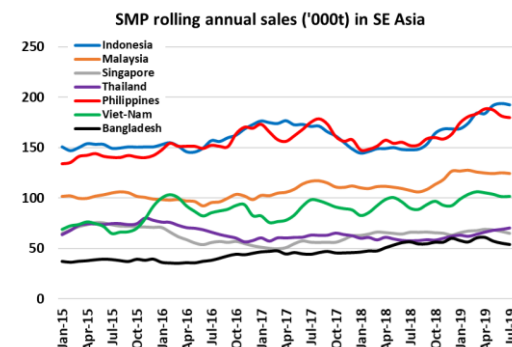
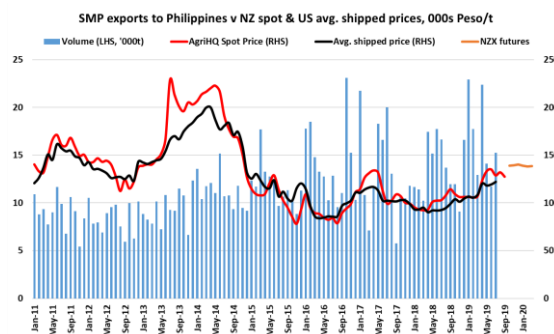
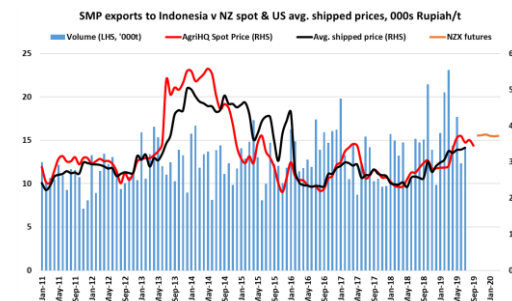
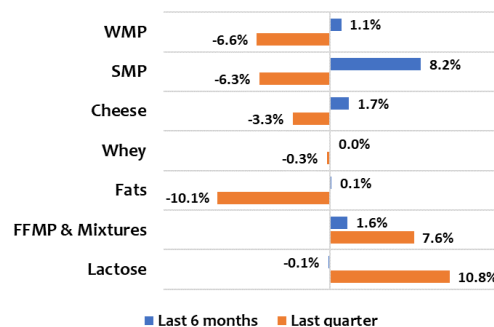


3.7 Developing Asia: more capacity?

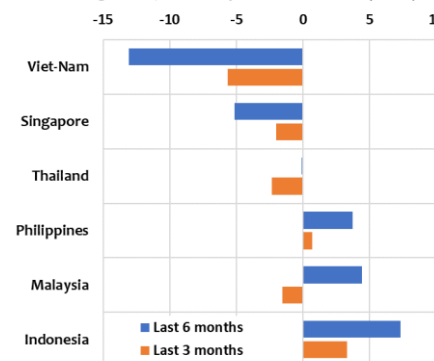
Can the region afford higher prices?

- SMP trade into this region surged in H1-2019 until a slowing of demand growth in June and July. Can the region's demand continue ... and will buyers in the region afford higher prices as the market tightens?
- Sustained growth in SMP trade is somewhat dependent on ongoing affordability of higher prices in the two biggest markets, Indonesia and Philippines, which accounted for 85% of the growth in trade in the 6 months to July 2019. Landed costs are at their highest in both countries since late 2014.
- WMP trade slowed in June and July at higher prices and will also be weaker in August. WMP prices have since weakened and settled within ranges experienced over the past 3 years in most regional markets.
- We assume a 3.2% growth in WMP trade for 2019, while 6% growth in SMP trade given the scale of the recent surge in demand. This implies falls in H2-2019 trade year-on-year.
- Fats remained relatively resilient, slowed in the July quarter by the hike in NZ selling prices but was 3% ahead for the first 7 months of the year. Trade should improve later in 2019 as lower prices reach buyers. We assume slower AMF and butter trade over the full 2019 year, down by a combined 2%.
- The regional cheese trade has been flat in 2019, slowing 3% in the July quarter. Firmer prices are being sought by major suppliers, but aggressive selling by EU suppliers may improve outcomes. We assume flat cheese demand for the region in 2019 and 2020.

Recent changes in exports to SE Asia



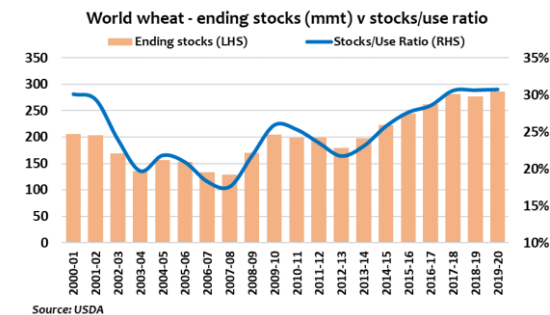
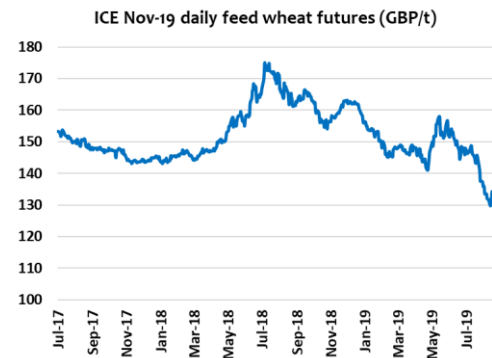
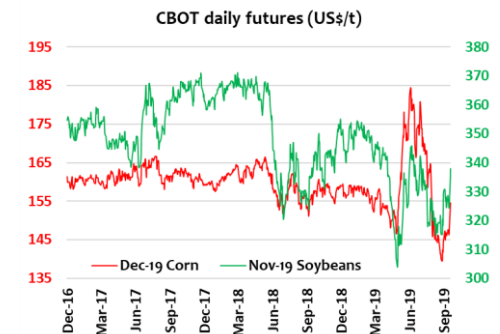
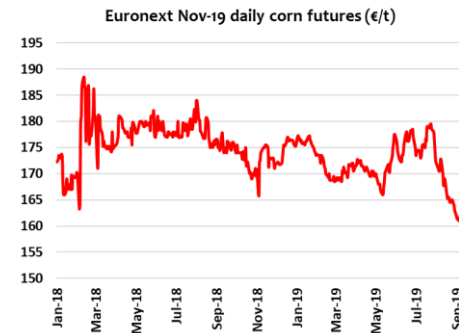
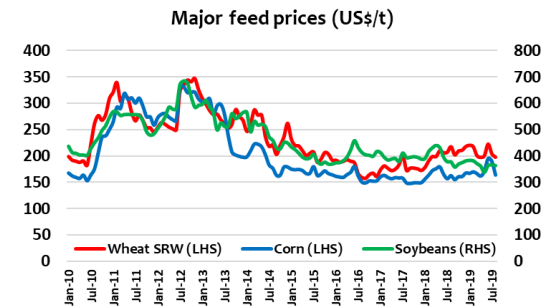
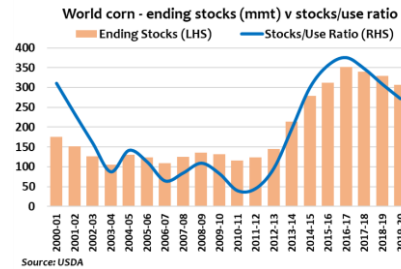
YOY growth, WMP exports to ASEAN-6 ('000t)



3.8 Feed supplies remain abundant

Supplies keep markets weak

- Feed grain and oilseed prices remain relatively weak across US, South America and Europe.
- We have seen some moderate recent falls in European and US prices that will support higher farm margins through Q42019 and H1-2020.
- USDA expects global grain output to grow 1.5% in 2020. The latest FAO outlook from early September reported a healthy stocks-to-use ratio for global wheat, but the coarse grain market will tighten a little – stocks-to-use falling from 28.9% to 26.4% in the 2019/20 market year.
- USDA estimates global corn production will fall 1.5% in 2020, while corn stocks should end the 2019/20 marketing year 7% lower than the prior year, but remain sufficient to keep prices depressed. Hence the projected falls in US corn yields has done little to change the outlook.
- Recent USDA corn and soybean forecasts surprised the market with lower-than-expected closing stock estimates, pushing futures prices higher. The USDA had earlier expected year-end soybean crops to be close to the record in the current year.
- Little is on the horizon that will change this, although sudden weather events may create some regional shortages.
- ASF has reduced global livestock feed demand which has pushed back up feed grain supply chains.
- Trade barriers have aided this oversupply in the US – keeping local corn and soybean markets oversupplied.



4. Regional profiles

Features in this section

Other Exporters

Australia 33

South America 34

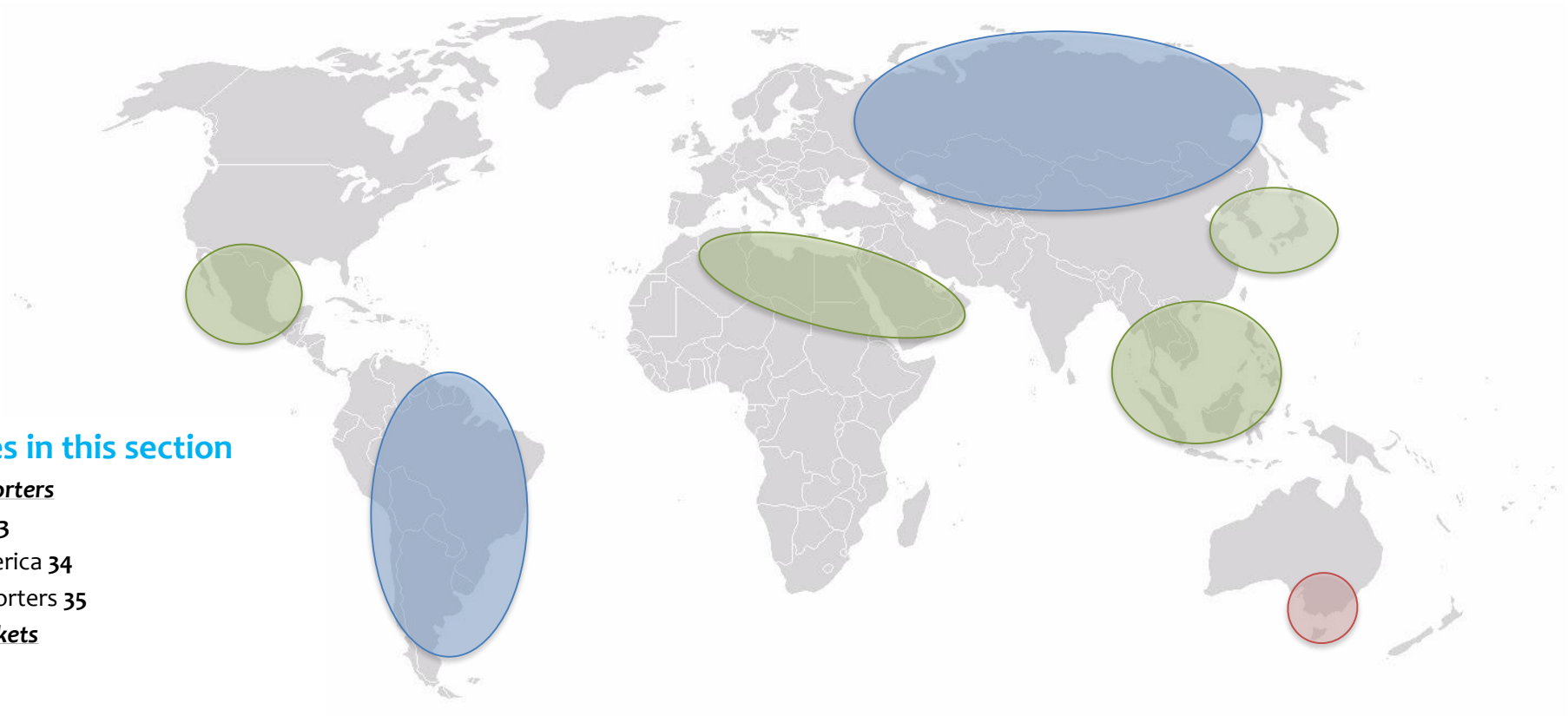
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4.1 Australia

Critical issues

Milk production

- Milk collections continue to lag the prior year, despite revisions in data.
- Rainfall has improved and may encourage some addition of cow numbers on farms with adequate feed and affordable water.
- Feedgrain costs are expected to stay well above average due to the small east coast grain crop, while Nth Victoria and Riverina water costs will remain prohibitive
- The outlook is for drier, warmer conditions across southern production regions, despite less chance of an El Nino event.

Milk prices

- Milk prices in southern regions will average close to A\$7.00/kgMS in 2019/20, varying with processors' product mix.

Products

- Cheese and higher value ingredients are prioritised in a smaller milk pool.

Supply chain

- With the reallocation of milk between processors, there is a greater challenge in 2019/20 to sustain cheese output.

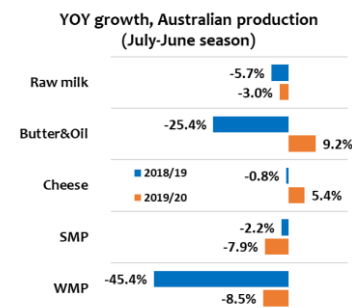
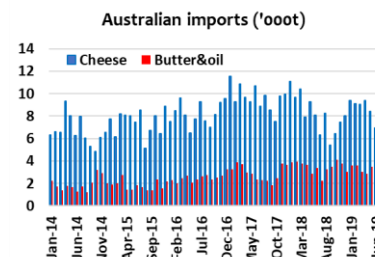
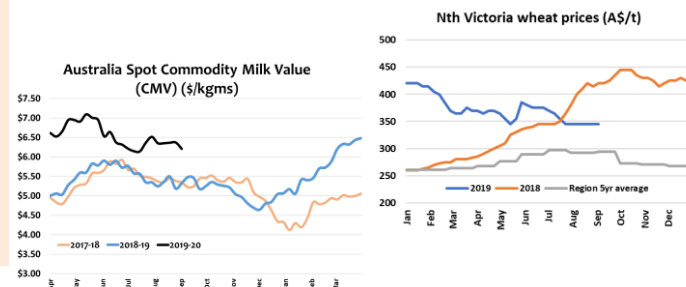
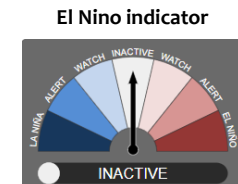
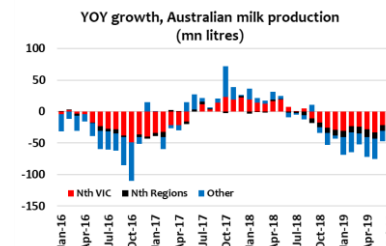
Outlook factors

- Milk production will fall 3-4% for the 2019/20 season.
- The flow-on effects of deeper herd losses from late 2018 onwards will flow through into Q3 2019/20.

- Prices to remain firm in 2019/20 with competitive pressure between main buyers.
- Shortages in cheese and butterfat supplies will keep wholesale prices firm
- Commodity milk values helped by falling A\$ against US\$.

- Fat prices will weaken with improved NZ availability and weaker EU prices

- Assumed cheese output will be maintained, increasing % of milk use, reducing availability of SMP/butter
- Greater role for ingredient and fat imports in 2019/20.



4.2 South America

Critical issues

Argentina

- Milk collections have improved to be close to prior year as weather and farm margins have improved
- Argentina Peso has lost more than 25% since early August against the US\$ due to the risk of a regime change and remained steady since.
- The domestic market remains weak, sales declining at a faster rate in late 2018 and early 2019. Cheese output was down just 2.4% in the 7 months to July 2019.

Uruguay

- Milk production has continued to recover, but with a smaller herd remained 3% below the prior year in August.
- Uruguay retains a high dependence on WMP exports to Algeria (growing 6% in the 7 months to July) but has also built sales to Central America and CIS with the risks associated with exports to Brazil.

Brazil

- Milk prices weakened to average R1.45 in August with improved weather and feed costs.
- Milk production remained well above the prior year, reducing the requirement for imports.
- Imports of WMP from Argentina and Uruguay remained above prior year in the 3 months to July, but growth slowed.
- Weaker economy, likely to stall and dip into recession in H2-2019 which will soften internal demand

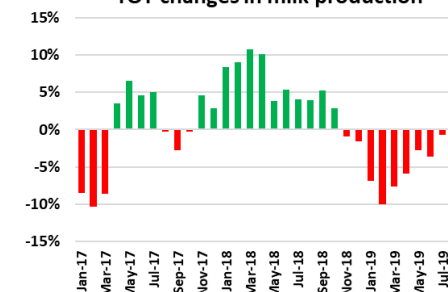
Outlook factors

- Milk output assumed to gradually improve through 2019, such that full year output falls 1.7%, growing 2% in 2020
- We assume a 5% reduction in WMP production over 2019 compared to 2018.
- Little change in product mix has been made in our outlook as the domestic market is assumed to remain slightly weaker
- Favorable local corn prices are helping improve milk producer margins.

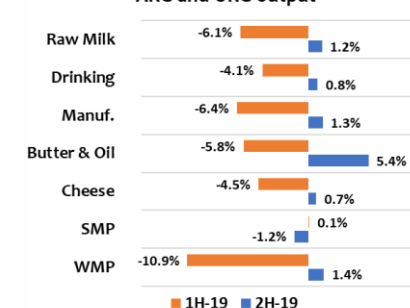
- YOY production falls expected to moderate through H2-2019 as the industry reaches its seasonal peak.
- Full year milk output is assumed to fall 4%.
- This will slightly reduce WMP output over the full year

- Production growth is expected at 3.4% over 2019 and flat in 2020.
- There was a tighter gap between milk prices in Arg and Brazil, but this will widen with the sharp fall in the Peso.
- Assumed import growth will fall below comparatives in H2-2019.

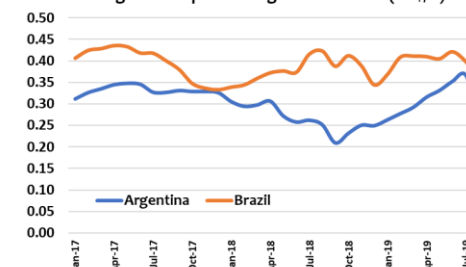
Combined Argentina and Uruguay
YOY changes in milk production



YOY growth in combined
ARG and URG output

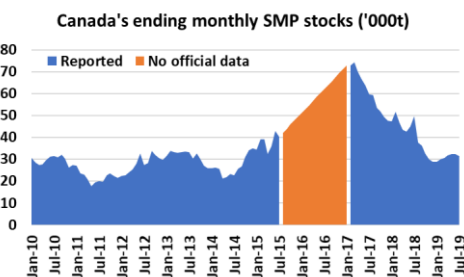
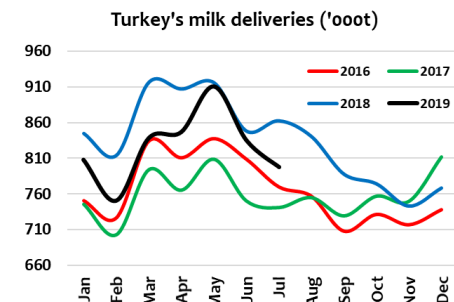


Farmgate milk prices - Argentina v Brazil (US\$/lt)



4.3 Other exporters

| | Critical issues | Outlook factors |
|---------------|--|---|
| Turkey | <ul style="list-style-type: none"> Turkey's milk output shrank 5% in H1-2019 and worsened in July. Cheese output fell 8% in the first 7 months, with the displaced milk shifting to SMP/butter. Higher SMP output has lifted exports to 25,000t in H1-2019, into a number of Middle Eastern markets, dominated by Saudi Arabia. Cheese trade was flat for the first 7 months of 2019, but slowed in recent months. | <ul style="list-style-type: none"> We expect a 3% fall in milk production in 2019, flattening out against the comparative in H2. The shift to higher SMP output will likely continue. |
| Canada | <ul style="list-style-type: none"> Milk production was 1.2% lower in H1-2019 Weaker milk supply is curbing surplus SMP. Exports of SMP have slowed and in moving-annual-total terms were down 43% on peak exports in Q2-2018. YTD exports were also down 43% on 2018, with the heaviest losses in the MENA region. Whey product trade has been largely sustained but was down 8% in the 7 months to July. | <ul style="list-style-type: none"> Milk production is projected to improve in H2-2019 to be flat over the full 2019 year. SMP exports are assumed to fall 10% in 2019, but increase slightly in 2020. |
| India | <ul style="list-style-type: none"> Exports of SMP have dried up. India more than tripled fat exports in H1-2019, but these have slowed to around 2,000t per month. | <ul style="list-style-type: none"> Butter trade will continue to slow as global prices fall. |



4.4 Mexico

Critical issues

Demand

- SMP shipments lifted 6% in H1-2019
- Cheese trade fell 11% in the first 7 months of 2019, but was 18% lower in the July quarter as average shipped prices lifted sharply
- The stalling of SMP trade into Venezuela means domestic market demand is actually much stronger.
- Local industry production? Lifting milk output – more into SMP/cheese??

Economy

- The economy is stagnating – economic growth was flat in Q2-2019 – and is likely to stay so for the remainder of the year. Manufacturing activity shrank for the 4th consecutive month in September
- Inflation has cooled to a little over 3%. First interest rate cut in 5 years and more are likely.
- The Peso weakened a little in the 2nd half of September

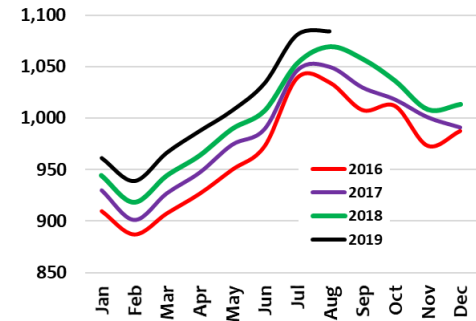
Trade dispute

- The USMCA has not yet been adopted by the US Congress, despite in-principle agreement between negotiators and leaders.
- There are some lingering risks of US action over unchecked immigration flows over the Mexican border.

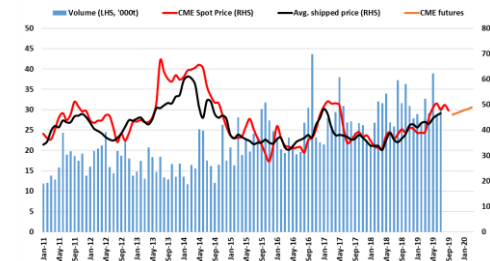
Outlook factors

- Demand for NFDM and cheese remains sensitive to landed costs.
- We assume NFDM will be 1% stronger and cheese 3% weaker in H2-2019
- Higher US cheese prices will weaken exports and open the door to EU cheese. Not yet made appreciable inroads

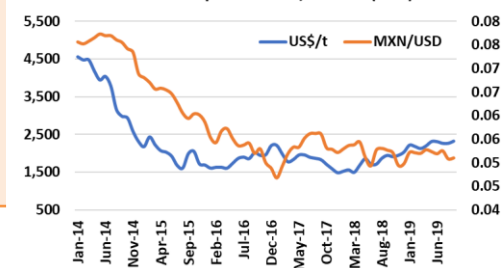
Mexico milk production (mn litres)



SMP exports to Mexico v CME spot & US avg. shipped prices, 000s Peso/t



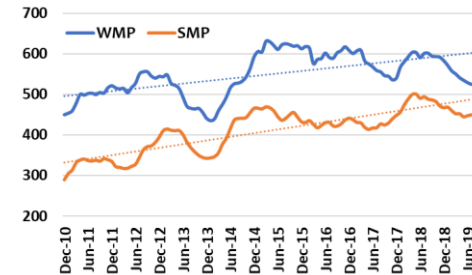
CME NFDM price v Peso/US rate (RHS)



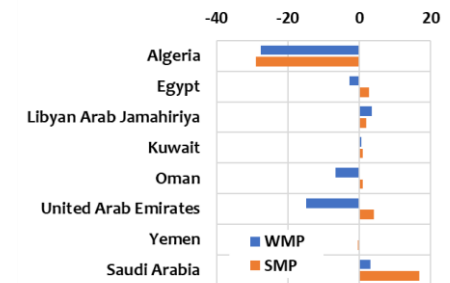
4.5 MENA

| | Critical issues | Outlook factors |
|------------------------|--|--|
| MENA in general | <ul style="list-style-type: none"> The major dairy markets in the region continue to weaken, pressured by uncertain economic outlooks, geopolitical threats and domestic political tensions There is likely to be a relatively flat trajectory for oil prices in the absence of further geopolitical tensions which will keep several economies operating below break-even oil prices under pressure | <ul style="list-style-type: none"> A continuing economic slowdown is expected in H2-2019 before a recovery in 2020, but that is dependent on the global economic picture and developments in the oil market. Economic growth prospects for the region are weaker with elevated geopolitical risks, and further oil production cuts. |
| Hot spots | <ul style="list-style-type: none"> WMP trade to Algeria weakened 21% in the first 7 months of 2019. NZ lifted its share to 57% in this period as Argentina shifted focus and EU was too costly SMP exports to the Middle East <u>lifted</u> 4% in the 7 months to July 2019. | <ul style="list-style-type: none"> We assume reduced import demand from the market and test scenarios for a more significant cut in trade in 2019 and 2020. There will be greater interest in WMP from Uruguay and Argentina with more availability in Q4-2019, but price sensitivity will remain a challenge. |
| Dairy demand | <ul style="list-style-type: none"> Algeria is due to come back to the market in Q4-2019 There has been increasing FFMP trade in the Middle East, substituting for WMP. Stronger FFMP demand in response to rising WMP prices and cheap palm oil prices. | <ul style="list-style-type: none"> We expect dairy demand to remain subdued into 2020. WMP demand will fall 11% in Middle East for 2019 while SMP demand will grow 1% after rising in H1-2019. WMP and SMP demand from Nth Africa will fall 13% and 9% respectively in 2019. Butterfat trade into the region should improve at lower prices. |

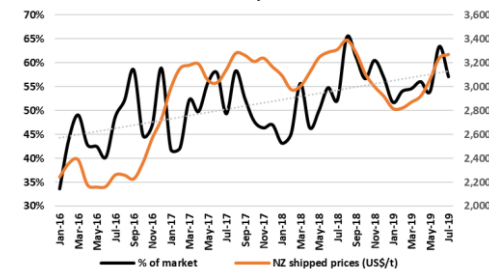
Milk powder exports to MENA MAT ('000t)



YOY growth, exports to MENA last 6 months ('000t)



FFMP % share of full-fat powder market in MENA



4.6 Other market regions

Critical issues

Japan

- Cheese trade remained 2% ahead of the comparable in the July quarter. Local output has fallen.
- Milk supply was flat for the first 8 months of 2019, improving a little in recent months.
- Milk used in cheese has dropped 4% in the past 6 months

South Korea

- The South Korean economy is mixed, with price deflation and slower exports while consumer spending and industrial output are rising.
- Cheese demand stalled and fell 3% in Q2-2019.

CIS states

- Increasing Russian import demand despite claims of rising self-sufficiency and capacity investments
- Increased cheese (15%) butter (49%), and SMP (31%) imports in the 7 months to July 2019, dominated by Belarus (with a higher NZ share in butter).
- Belarus increasing small amounts of trade outside the CIS with Asia.

Sub-Saharan Africa

- The FFMP & mixtures trade continued to expand rapidly (up 17% in 7 months to July).
- WMP trade shrank 12% in the 7 months to July
- Expected slowing with Nigerian ban on dairy, depending on the timing and any exemptions.
- Nigeria had 47% of FFMP, 46% of WMP in H1-2019

Outlook factors

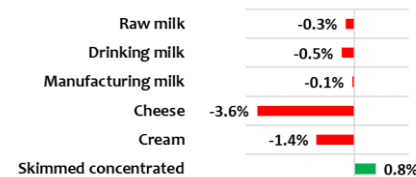
- The economy is expected to slow with weaker industrial output, widening effects of the US-China trade war and a sales tax increase. Consumer sentiment continued to weaken in September.
- More aggressive export competition is likely, especially the EU which lost ground to NZ and US.
- We assume cheese demand will remain steady through Q4-2019 to achieve 3.4% growth in 2019.

- The erosion of trade activity is expected to further weigh on the economy.
- The US has picked up share in cheese sales in 2019 but will face stiffer rivalry from the EU.
- We assume cheese demand grows 5% in 2019, sustaining the growth rate to July.

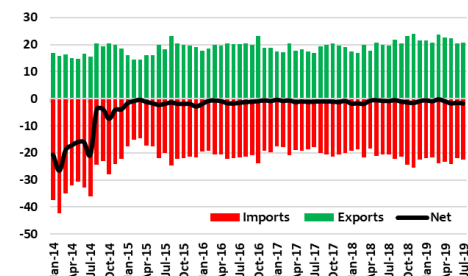
- Little change in the net external trade with rest of world
- No lifting of the Russian embargo has been assumed through 2020.
- Slowing Russian economy with little expansion in oil revenues and weaker inflation might affect consumer demand.

- Likely slowing of Nigerian demand
- The outlook for oil will have a major influence on improved economic fundamentals for the region
- We assume a 11% fall in WMP demand in 2019, but 18% growth in SMP demand for the region.

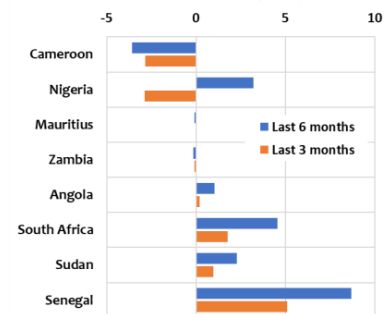
Growth in Japan's milk by use
8 months to August 2019



CIS cheese net exports ('000t)



YOY growth, FFMP&Mixtures exports to
Sub-Saharan Africa ('000t)



Appendix – The Dairy Trade Simulator



Features in this section

September 2019 outlook assumptions **40-41**

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Market tension and value projections **43**

September 2019 outlook assumptions

Projection assumptions

- Milk supply growth assumptions are based on specific trends and conditions in each major exporting region (changes from last update in black per table on right).
- Projected product mix for each major exporter takes account of historical mix data from each industry, adjusted for changes in milk supply, taking account of domestic demand, product valorisation and export market prospects. In the EU this has been built from country-level analysis.

Changes in the outlook in this update

- We made a number of changes in this revision. The key adjustment are summarized in the table below:

| Variable | Last update (August 2019) | Revised outlook |
|------------------------------|--|--|
| EU milk production | <ul style="list-style-type: none"> 2H-19 grows by 0.9% 2020 grows by 1.2% 2021 grows by 1.3% | <ul style="list-style-type: none"> 2H-19 grows by 0.8% 2020 grows by 0.5% 2021 grows by 1.3% |
| NZ milk production | <ul style="list-style-type: none"> 2019/20 grows by 1% 2020/21 is flat | <ul style="list-style-type: none"> 2019/20 grows by 1.1% 2020/21 is flat |
| US milk production | <ul style="list-style-type: none"> 2H-19 grows by 0.3% 2020 grows by 1% 2021 grows by 1.5% | <ul style="list-style-type: none"> 2H-19 grows by 0.4% 2020 grows by 0.2% 2021 grows by 1.5% |
| Other milk production | <ul style="list-style-type: none"> Australia declines 3% in 2019/20 Argentina declines 2% in 2019 Uruguay declines 4% in 2019 Brazil grows 1.1% in 2019 Turkey declines 2.9% in 2019 Canada is flat in 2019 Belarus falls 0.1% in 2019 Ukraine declines 1.8% in 2019 | <ul style="list-style-type: none"> Australia declines 3% in 2019/20 Argentina declines 1.7% in 2019 Uruguay declines 4.2% in 2019 Brazil grows 3.4% in 2019 Turkey declines 3.2% in 2019 Canada is flat in 2019 Belarus grows 0.5% in 2019 Ukraine declines 2.3% in 2019 |
| EU product mix | <ul style="list-style-type: none"> Cheese grows 1.5%, SMP grows 5.9%, butter & oil grows 2.5% and WMP falls 7.8% in 2H-2019 Cheese grows 0.9%, SMP grows 3.4%, butter & oil grows 2.2% and WMP falls 4.6% in 2020 | <ul style="list-style-type: none"> Cheese grows 1.4%, SMP grows 4.2%, butter & oil grows 3% and WMP falls 1.8% in 2H-2019 Cheese grows 0.8%, SMP grows 2.6%, butter & oil grows 2.5% and WMP falls 1.9% in 2020 |

| Short-Term Milk Supply Growth (YOY) | | | | | | | | | | | |
|-------------------------------------|------|------|------|-------|------|------|-------|-------|-------|-------|------|
| | NZ | EU | US | AUS | ARG | BEL | UKR | BRA | URG | TUR | CAN |
| Aug-19 | 0.8% | 0.8% | 0.2% | -6.0% | 2.1% | 1.4% | -4.8% | 3.0% | -3.7% | -2.0% | 1.0% |
| Sep-19 | 0.0% | 1.0% | 0.2% | -5.0% | 2.0% | 1.5% | 0.5% | 2.0% | -1.0% | -1.0% | 2.0% |
| Oct-19 | 0.0% | 0.9% | 0.5% | -5.0% | 2.0% | 1.5% | 1.0% | 1.0% | 0.0% | 0.0% | 2.0% |
| Nov-19 | 1.5% | 1.0% | 0.5% | -3.0% | 2.0% | 1.5% | 1.0% | 1.0% | 1.0% | 1.0% | 2.0% |
| Dec-19 | 0.5% | 0.9% | 0.5% | -3.0% | 2.0% | 1.5% | 1.0% | 1.0% | 1.0% | 2.0% | 2.0% |
| Jan-20 | 0.5% | 0.9% | 0.5% | -2.0% | 2.0% | 1.5% | 1.0% | -5.0% | 3.0% | 2.0% | 2.0% |
| Feb-20 | 0.5% | 1.0% | 0.5% | -1.0% | 2.0% | 1.5% | 1.0% | 1.0% | 1.0% | 5.0% | 2.0% |
| Mar-20 | 3.0% | 0.9% | 0.5% | 0.0% | 2.0% | 1.5% | 1.0% | 1.0% | 3.0% | 2.0% | 2.0% |
| Apr-20 | 3.0% | 1.0% | 1.0% | 0.0% | 2.0% | 1.5% | 1.0% | 1.0% | 5.0% | 2.0% | 2.0% |
| May-20 | 1.0% | 1.1% | 1.0% | 0.0% | 2.0% | 1.5% | 1.0% | -5.0% | 5.0% | 2.0% | 2.0% |
| Jun-20 | 0.0% | 1.1% | 1.0% | 0.0% | 2.0% | 1.5% | 1.0% | 1.0% | 3.0% | 2.0% | 2.0% |
| Jul-20 | 0.0% | 1.1% | 1.1% | 0.0% | 2.0% | 2.0% | 1.0% | 1.5% | 3.0% | 2.0% | 2.0% |
| Aug-20 | 0.0% | 1.1% | 1.2% | 0.0% | 2.0% | 2.0% | 1.0% | 1.5% | 2.0% | 2.0% | 2.0% |
| Sep-20 | 0.0% | 1.1% | 1.3% | 0.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Oct-20 | 0.0% | 1.1% | 1.4% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Nov-20 | 0.0% | 1.1% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Dec-20 | 0.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Jan-21 | 0.0% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Feb-21 | 0.0% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Mar-21 | 0.0% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Apr-21 | 0.0% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| May-21 | 0.0% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Jun-21 | 0.5% | 1.2% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Jul-21 | 0.5% | 1.3% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Aug-21 | 0.5% | 1.4% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Sep-21 | 0.5% | 1.5% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Oct-21 | 0.5% | 1.5% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Nov-21 | 0.5% | 1.5% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |
| Dec-21 | 0.5% | 1.5% | 1.5% | 1.0% | 2.0% | 2.0% | 1.0% | 1.5% | 1.0% | 2.0% | 2.0% |

Product mix (including domestic and export use) assumptions of the major exporters

| Product Mix - Share of Primary Tonnes | | | | | | | | | | | | |
|---------------------------------------|--------|-------|-------|--------|------|-------|--------|--------|------|-------|--------|--------|
| | NZ | | | | US | | | | EU | | | |
| | Cheese | SMP | WMP | Butter | WMP | SMP | Cheese | Butter | WMP | SMP | Cheese | Butter |
| Jul-18 | 96.4% | 1.2% | 1.4% | 1.0% | 0.6% | 15.2% | 83.4% | 0.8% | 5.8% | 12.8% | 74.2% | 7.2% |
| Aug-18 | 22.0% | 11.9% | 65.1% | 1.0% | 0.7% | 13.7% | 84.0% | 1.6% | 5.4% | 11.5% | 75.4% | 7.7% |
| Sep-18 | 12.1% | 22.9% | 64.0% | 1.0% | 0.5% | 12.8% | 84.3% | 2.4% | 5.6% | 11.9% | 75.1% | 7.4% |
| Oct-18 | 12.1% | 22.7% | 64.2% | 1.0% | 0.4% | 12.4% | 84.4% | 2.8% | 5.6% | 10.5% | 75.2% | 8.8% |
| Nov-18 | 12.1% | 19.0% | 67.9% | 1.0% | 0.5% | 13.4% | 83.3% | 2.7% | 5.1% | 11.0% | 75.2% | 8.7% |
| Dec-18 | 11.7% | 19.0% | 68.3% | 1.0% | 0.6% | 14.2% | 81.7% | 3.6% | 6.1% | 13.6% | 71.7% | 8.5% |
| Jan-19 | 12.5% | 17.4% | 69.1% | 1.0% | 0.9% | 15.4% | 79.5% | 4.2% | 5.5% | 12.7% | 72.8% | 9.0% |
| Feb-19 | 15.6% | 18.7% | 64.8% | 1.0% | 0.8% | 15.3% | 80.1% | 3.8% | 5.2% | 12.8% | 73.4% | 8.6% |
| Mar-19 | 17.4% | 12.4% | 69.1% | 1.0% | 1.8% | 15.1% | 80.2% | 2.9% | 5.4% | 12.9% | 72.7% | 9.1% |
| Apr-19 | 21.0% | 9.7% | 68.3% | 1.0% | 1.8% | 15.5% | 80.2% | 2.5% | 6.1% | 13.9% | 71.6% | 8.4% |
| May-19 | 41.4% | 0.7% | 56.9% | 1.0% | 1.3% | 14.4% | 81.6% | 2.7% | 6.2% | 14.3% | 71.5% | 8.0% |
| Jun-19 | 96.3% | 1.1% | 1.6% | 1.0% | 1.0% | 15.4% | 82.1% | 1.5% | 6.2% | 13.4% | 72.7% | 7.7% |
| Jul-19 | 96.0% | 0.0% | 3.0% | 1.0% | 0.6% | 15.6% | 82.7% | 1.1% | 5.9% | 12.2% | 73.6% | 8.3% |
| Aug-19 | 22.4% | 11.8% | 64.8% | 1.0% | 0.8% | 14.1% | 83.2% | 1.9% | 5.4% | 11.9% | 74.9% | 7.9% |
| Sep-19 | 12.6% | 22.8% | 63.7% | 1.0% | 0.5% | 12.9% | 83.6% | 2.7% | 5.8% | 11.9% | 74.9% | 7.5% |
| Oct-19 | 12.6% | 22.8% | 63.7% | 1.0% | 0.2% | 12.0% | 85.1% | 2.7% | 5.0% | 11.4% | 74.9% | 8.6% |
| Nov-19 | 12.6% | 19.0% | 67.4% | 1.0% | 0.2% | 12.5% | 84.1% | 3.1% | 5.0% | 11.5% | 75.0% | 8.5% |
| Dec-19 | 12.6% | 19.0% | 67.4% | 1.0% | 0.3% | 13.2% | 83.1% | 3.4% | 5.4% | 14.1% | 72.4% | 8.1% |
| Jan-20 | 13.4% | 17.8% | 67.8% | 1.0% | 0.6% | 15.8% | 80.0% | 3.6% | 5.5% | 13.6% | 72.7% | 8.2% |
| Feb-20 | 16.5% | 19.1% | 63.5% | 1.0% | 1.0% | 14.6% | 80.8% | 3.6% | 5.4% | 13.8% | 72.5% | 8.3% |
| Mar-20 | 18.3% | 12.8% | 67.8% | 1.0% | 0.6% | 15.3% | 81.2% | 2.9% | 5.2% | 12.8% | 73.8% | 8.2% |
| Apr-20 | 21.3% | 10.1% | 67.6% | 1.0% | 0.6% | 15.8% | 80.7% | 2.9% | 5.6% | 14.1% | 71.9% | 8.4% |
| May-20 | 41.6% | 0.0% | 57.4% | 1.0% | 1.2% | 16.1% | 80.3% | 2.4% | 5.5% | 15.4% | 71.3% | 7.8% |
| Jun-20 | 96.3% | 0.0% | 2.7% | 1.0% | 1.2% | 15.6% | 82.4% | 0.8% | 5.6% | 14.9% | 72.3% | 7.2% |
| Jul-20 | 96.3% | 0.0% | 2.7% | 1.0% | 0.6% | 15.5% | 83.2% | 0.8% | 5.5% | 14.2% | 73.2% | 7.0% |
| Aug-20 | 22.7% | 11.8% | 64.5% | 1.0% | 0.9% | 14.2% | 83.3% | 1.6% | 5.1% | 12.6% | 74.8% | 7.5% |
| Sep-20 | 12.9% | 22.8% | 63.4% | 1.0% | 1.0% | 13.0% | 83.7% | 2.4% | 5.5% | 12.6% | 74.8% | 7.1% |
| Oct-20 | 12.9% | 22.8% | 63.4% | 1.0% | 0.3% | 12.1% | 85.2% | 2.4% | 4.8% | 12.1% | 74.8% | 8.2% |
| Nov-20 | 12.9% | 19.0% | 67.1% | 1.0% | 0.3% | 12.6% | 84.2% | 2.8% | 4.8% | 12.2% | 74.9% | 8.1% |
| Dec-20 | 12.9% | 19.0% | 67.1% | 1.0% | 0.4% | 13.3% | 83.2% | 3.1% | 5.2% | 14.8% | 72.3% | 7.7% |

September 2019 outlook assumptions

Demand-side variables

- The tables below contains individual regional demand assumptions for key products based on our analysis of recent trade; long-term demand trends; background analysis and input from market traders as to the appetite for forward demand in the short-term.
- Domestic consumption in the US and EU accounts for commercial disappearance of product in each region.
- This table below shows the significant import demand regions (changes from last update in black per table below).
- The DTS contains import demand assumptions for all market regions and product groups.

Assumptions used in our Dairy Trade Simulator for significant market-product combinations

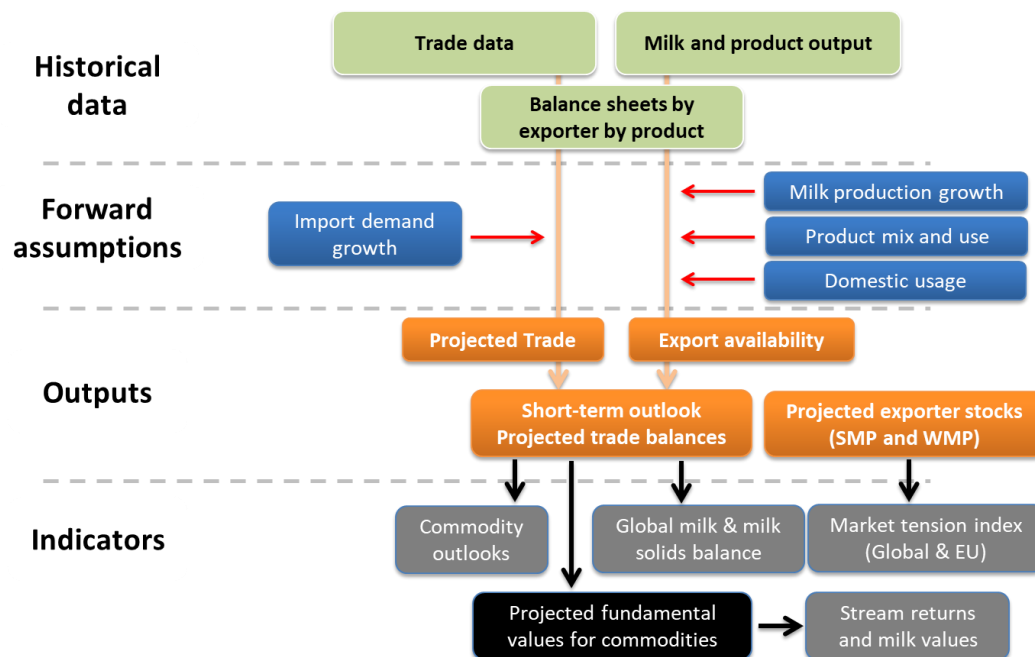
| Domestic Consumption Growth (YOY) | | | | | | |
|-----------------------------------|--------|------|------------|-------|--------|-------|
| | Cheese | | Fluid Milk | | Butter | |
| | US | EU | US | EU | US | EU |
| Jun-18 | 1.7% | 1.4% | -4.1% | -3.3% | 2.1% | 1.4% |
| Jul-18 | 6.9% | 1.3% | -2.2% | -1.6% | 9.3% | 0.6% |
| Aug-18 | 6.2% | 1.2% | -1.8% | -4.4% | 1.9% | -2.0% |
| Sep-18 | -0.3% | 1.1% | -5.6% | -4.4% | -10.4% | 0.4% |
| Oct-18 | 3.4% | 1.3% | -0.4% | -4.3% | 9.3% | -3.4% |
| Nov-18 | 4.5% | 0.9% | -0.1% | -3.3% | 8.9% | 0.7% |
| Dec-18 | 3.3% | 0.5% | -2.1% | -4.7% | -6.2% | -4.6% |
| Jan-19 | -3.0% | 1.6% | -0.5% | -2.2% | 27.6% | 3.1% |
| Feb-19 | 3.1% | 1.2% | -1.9% | -0.6% | 5.4% | -0.6% |
| Mar-19 | -0.3% | 1.3% | -4.7% | -4.3% | -10.6% | 0.4% |
| Apr-19 | 1.7% | 1.5% | -1.0% | 0.3% | 11.0% | -0.3% |
| May-19 | 6.4% | 1.5% | -0.8% | -1.1% | 3.8% | 4.1% |
| Jun-19 | 2.0% | 1.5% | -4.1% | -2.6% | -2.9% | 3.8% |
| Jul-19 | 4.6% | 1.5% | 0.2% | -1.0% | -4.1% | 0.0% |
| Aug-19 | 2.5% | 1.0% | -2.0% | -1.5% | 0.0% | 1.0% |
| Sep-19 | 2.5% | 1.0% | -2.0% | -1.5% | 1.0% | 2.0% |
| Oct-19 | 2.5% | 1.0% | -2.0% | -1.5% | -5.0% | 2.0% |
| Nov-19 | 2.5% | 1.0% | -2.0% | -1.5% | -4.0% | 2.0% |
| Dec-19 | 2.5% | 1.0% | -2.0% | -1.5% | 1.0% | 2.0% |
| Jan-20 | 2.0% | 1.0% | -1.8% | -1.5% | -5.0% | 2.0% |
| Feb-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Mar-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Apr-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| May-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Jun-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Jul-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Aug-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Sep-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Oct-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Nov-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |
| Dec-20 | 2.0% | 1.0% | -1.8% | -1.5% | 1.0% | 2.0% |

| Short-Term Import Demand Growth (YOY) | | | | | | | | | | | | | | | |
|---------------------------------------|--------|----------|------|------|-------|--------|----------|------|------|-----|--------|-----|-------|--------|-----|
| | WMP | | | | | SMP | | | | | Cheese | | | Butter | |
| | SEAsia | China/HK | MidE | NoAf | SthAm | SEAsia | China/HK | MidE | NoAf | MEX | SEAsia | CIS | Japan | MidE | CIS |
| Aug-19 | -20% | 34% | -10% | -30% | -20% | 10% | 10% | 10% | 0% | -5% | -2% | 3% | 0% | -30% | 0% |
| Sep-19 | -10% | 5% | 0% | 5% | -20% | -15% | 0% | 5% | 0% | 10% | -2% | 3% | 3% | -30% | 0% |
| Oct-19 | 3% | 5% | 0% | -5% | -20% | -10% | -10% | 0% | 0% | -5% | -2% | 3% | 3% | -20% | 0% |
| Nov-19 | 3% | 10% | 0% | -5% | -20% | 5% | -10% | 0% | 0% | -5% | -2% | 3% | 3% | -20% | 0% |
| Dec-19 | 3% | -16% | 0% | -5% | -20% | 5% | 10% | -20% | 0% | -5% | -2% | 3% | 3% | -20% | 0% |
| Jan-20 | 3% | 3% | 0% | -5% | 2% | -5% | 5% | -5% | 2% | -5% | 1% | 2% | 3% | 3% | 2% |
| Feb-20 | 3% | 3% | 0% | -5% | 2% | -5% | 5% | 3% | 2% | 2% | -5% | 2% | 3% | 3% | 2% |
| Mar-20 | 3% | 3% | 0% | -5% | 2% | -5% | 5% | 3% | 2% | 2% | -5% | 2% | 3% | 3% | 2% |
| Apr-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | -10% | 2% | 2% | -5% | 2% | 3% | 3% | 2% |
| May-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Jun-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Jul-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Aug-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Sep-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Oct-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Nov-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Dec-20 | 3% | 3% | 0% | -5% | 2% | 3% | 5% | 3% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Jan-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Feb-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Mar-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Apr-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| May-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Jun-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Jul-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Aug-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Sep-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Oct-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Nov-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |
| Dec-21 | 3% | 3% | 0% | 0% | 2% | 2% | 2% | 2% | 2% | 2% | 1% | 2% | 3% | 3% | 2% |

Methodology

Overview

- The DTS brings total global dairy trade in major products into a short-term modelling simulation tool (monthly to the end of 2021)
- It calculates a world market balance in terms of the four major dairy commodity products as well as in milk-equivalent terms over time.
- It allows modelling and testing of the sensitivity of the trade balance to movements in key variables.
- A “most likely case” is the base projection for the short-term outlook, and which forms the starting point for long-term projections.
- The model is based on assumptions as to:
 - Milk production growth in major exporters;
 - Product mix – in terms of the use of milk in major commodity product groups – of major exporters;
 - Consumption demand in domestic markets of major exporters – affecting the volumes of product available;
 - Prevailing stock levels held by major exporters; and
 - Changes in import demand from customer countries



Market tension and value projections

Market tension

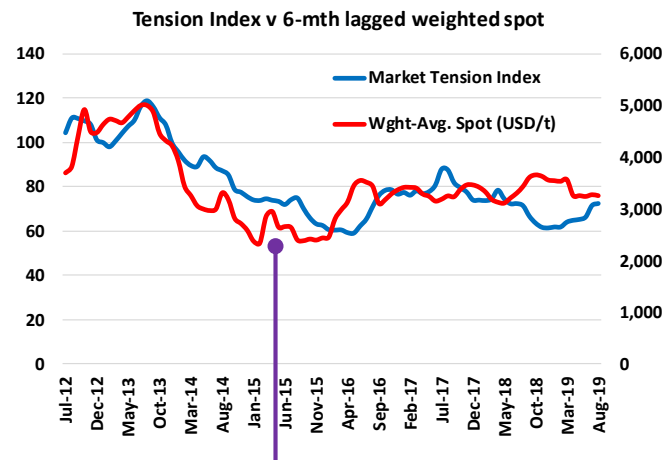
- The chart on the right illustrates the strong (but lagged) correlation between our MTI and a composite weighted average spot price. The lead-indicator effect of the MTI has improved since better EU stock estimates were developed by that industry.
- The weighted average spot price has been derived using the annual global export mix and monthly Oceania spot price quotations for the main 4 dairy commodities - WMP, SMP, cheddar and butter. Our analysis shows that the product mix of exports has not altered greatly in recent years.

Adjustment to MTI

- We implemented an adjustment to the MTI in this update to reflect the changing situation regarding SMP Intervention in the EU. We originally created an adjusted MTI in 2016 to reflect the restrictions in availability of SMP to the market through the build up of intervention stocks.
- This was done by discounting the effect of Intervention tonnages from total SMP stocks, as it reflected the way the market was valuing SMP.
- With the fast disposal of stocks through tenders in Q4-2018, and the expected clearance in H1-2019, we have progressively reduced the discount factor through that clearance period, such that “adjusted” and “absolute” tension measures converge.

Projected Fundamental Values (PFVs)

- By using the scenario-analysis functionality of the DTS, we developed an analytical framework to provide short-term monthly projections of fundamental values for Oceania, Europe and the US based on variables which have, in the past, shown the greatest correlation with, and have the most explanatory power for price movements.
- The charts on the right shows the close relationship between actual historical prices and the projected prices using formulae derived from the econometric modelling – using examples from the DTS.



The Weighted Spot Price (red line) was brought forward in this chart to provide the comparison for the correlation workings.

