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Report Highlights:

New Zealand milk production is forecast to fall in 2022 as a result of continued dry conditions in key producing areas, high feed prices, a smaller dairy herd, and continued labor shortages. Milk production in the first quarter of 2022 was down six percent from the previous year and was the lowest first quarter level since 2013. This decline is despite record farmgate dairy prices. As a result of lower milk supply, New Zealand whole milk powder exports are expected to decline the most of the major processed dairy products, with cheese exports slightly down but both skim milk powder and butter exports expected to be slightly higher.

Executive Summary

New Zealand milk production is forecast to fall in 2022 as a result of continued dry conditions in key producing areas, high feed prices, a smaller dairy herd, and continued labor shortages. Milk production in the first quarter of 2022 was down six percent from the previous year and was the lowest first quarter level since 2013. This decline is despite record farmgate dairy prices. As a result of lower milk supply, New Zealand whole milk powder exports are expected to decline the most of the major processed dairy products, with cheese exports slightly down but both skim milk powder and butter exports expected to be slightly higher.

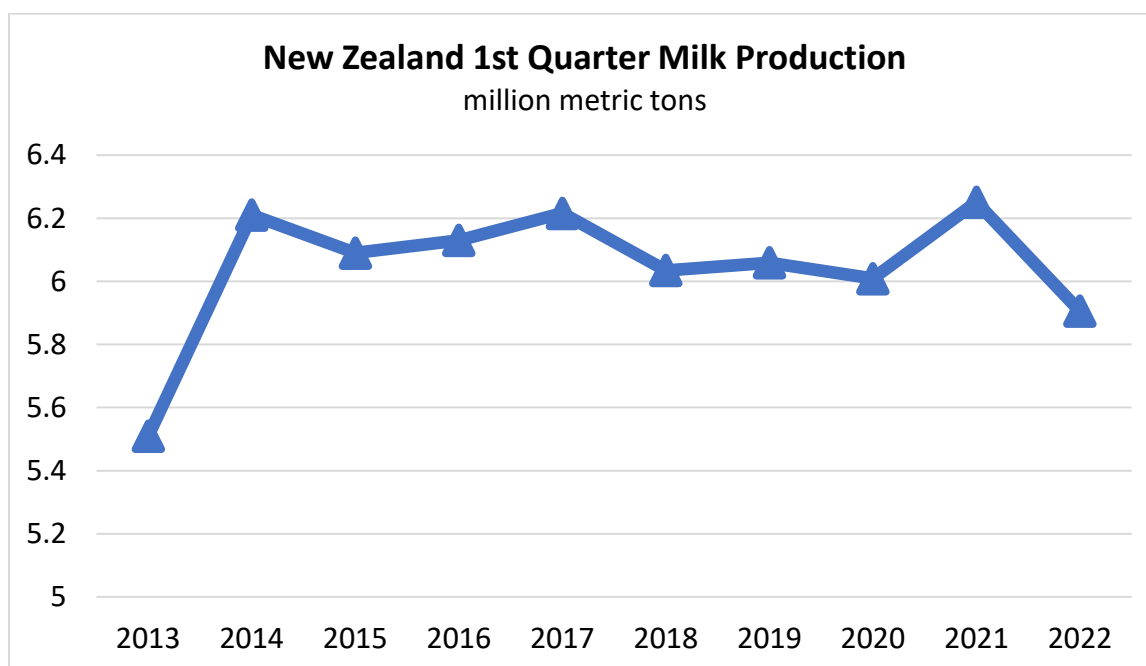
Liquid Milk Production

2022

FAS/Wellington has revised down the New Zealand 2022 milk production forecast to 21.8 million metric tons (MMT), which if realized would be the lowest annual level since 2017, and one percent below the revised 2021 number. The downward revision in forecast milk production is a result of a number of factors:

--Lower First Quarter Production: Milk production in the first quarter of 2022 was down significantly from the record level reached during the first quarter of 2021. According to the Dairy Companies Association of New Zealand, production fell to 5.906 MMT, down six percent from the previous year and the lowest level for the first quarter since 2013 (see Figure 1).

Figure 1 – 1st Quarter Milk Production



Source: DCANZ

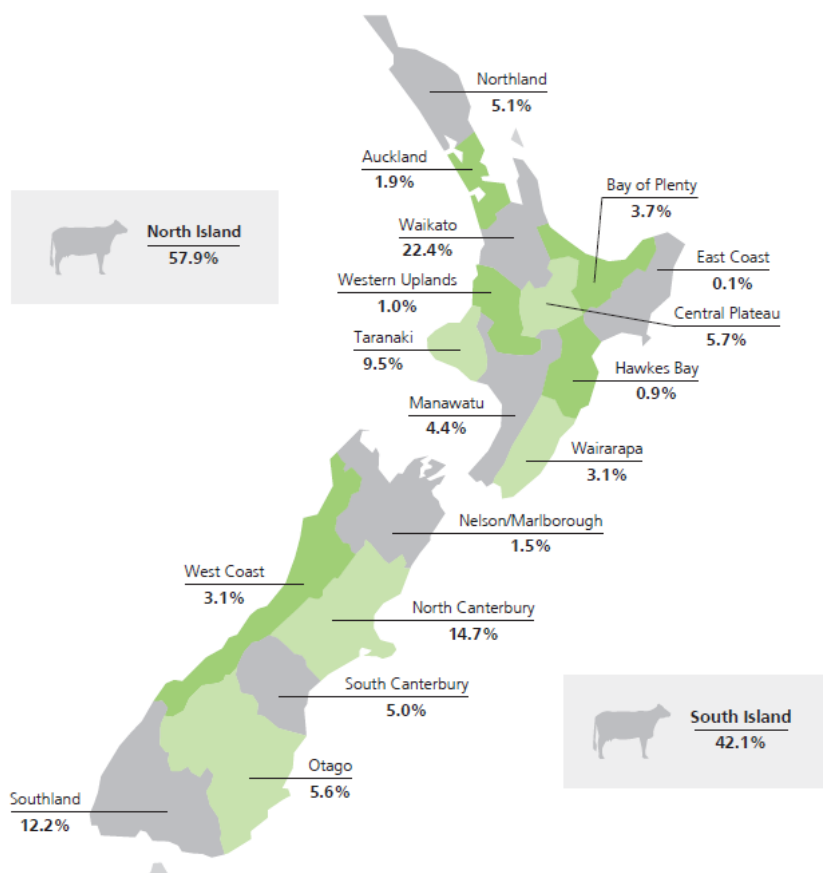
This fall was caused by dryness in some key production areas impacting pastures. The Southland region in the South Island experienced severe drought, and there was also persistent dryness in the Waikato region of the North Island (which is the highest producing region in New Zealand). In addition, overall New Zealand first quarter production in 2021 was unusually high, so some decline in 2022 was expected.

Because of this poor first quarter, even a return to more normal Spring pasture and milk production levels later in 2022 would still likely result in an overall year-on-year drop in production from 2021.

--Continued Dry Conditions in Key Production Areas

As mentioned, dry conditions have impacted milk supply so far this year, and these conditions are persisting in key regions. Waikato, which is the largest producing region (see Figure 2) and accounts for nearly a quarter of all dairy cows, is currently experiencing extremely low soil moisture (see Figure 3), and other areas in the South Island are also very dry. Southland, which accounts for 12 percent of the dairy herd, had extreme drought earlier in the year but recent rains have improved the situation.

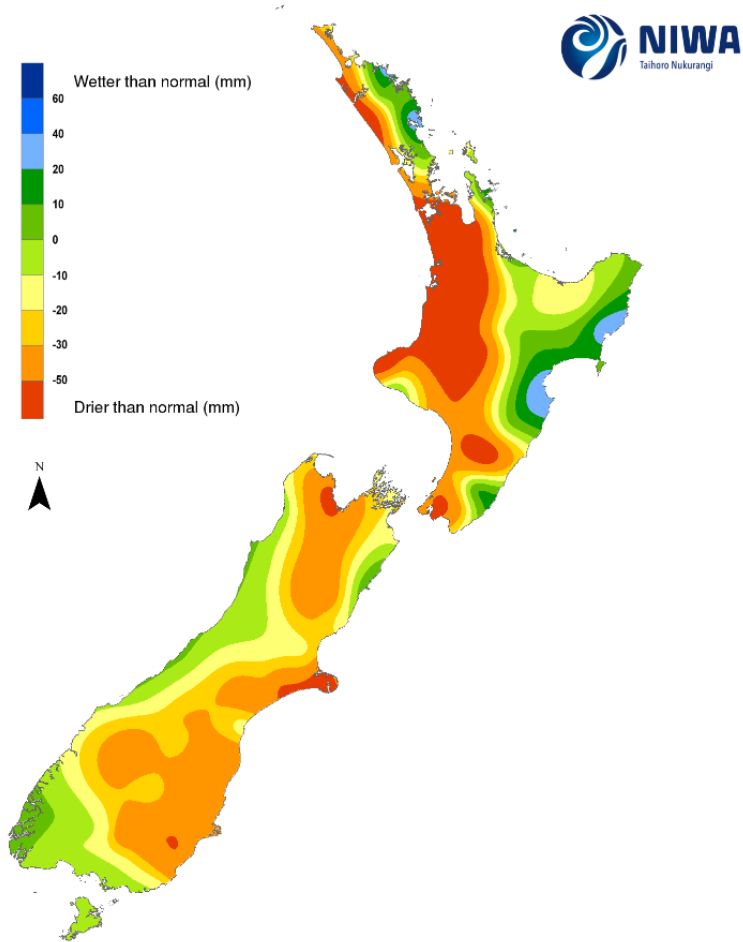
Figure 2: Regional Distribution Dairy Cows 2020/2021 Season



Source: New Zealand Dairy Statistics 2020-21, LIC and Dairy NZ

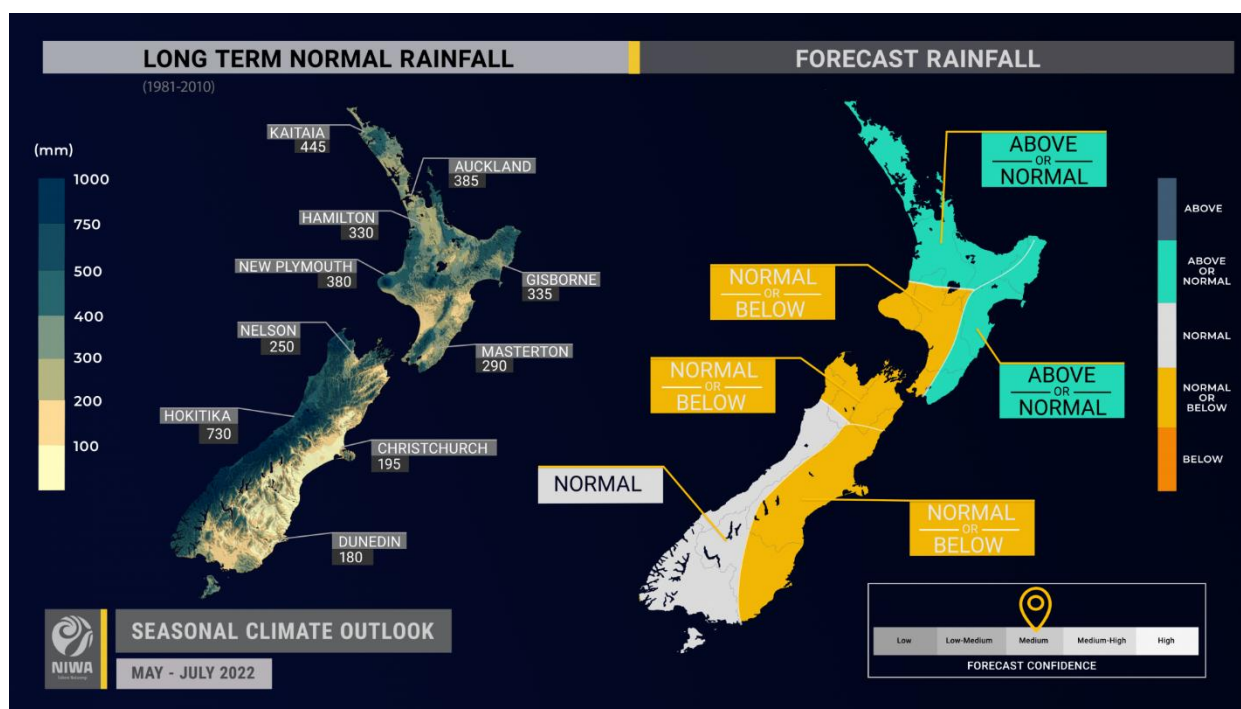
Figure 3: Soil Moisture as of May 8, 2022

Soil moisture anomaly (mm) at 9am on 08/05/2022



Rainfall forecasts for New Zealand for the next few months are also a mixed bag. The NIWA (National Institute of Water and Atmospheric Research) forecast for rainfall from May to July for part of the North Island (including Waikato) is for normal to above normal (see Figure 4), although for other parts of the North Island and key parts of the South Island it is only for normal to below normal rainfall.

Figure 4: Rainfall Forecasts May – July



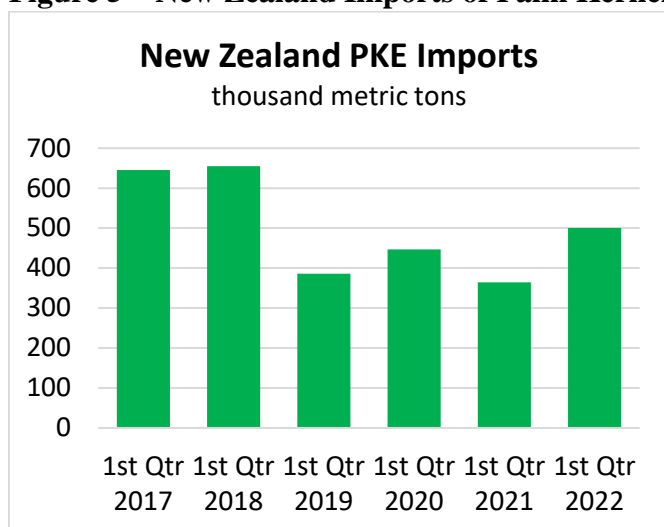
--Sharply Higher Input Costs

Another factor impacting dairy farmers is the sharply higher prices of inputs. Fertilizer prices have been skyrocketing and feed prices have also been rising, in part due to the Russian invasion of Ukraine. Global tightness has driven prices of New Zealand's imported feed higher, and for example prices for Palm Kernel Expeller (PKE) are now at \$500 NZD per metric ton (about \$315 USD), compared to less than \$300 NZD last year.

Despite these high prices, demand for imported feed has still been expanding to make up for poorer pastures and lack of on-farm feed. For example, in the first quarter of 2022 imports of PKE were up nearly 40 percent from the same time in 2021 (see Figure 5). Domestic grain and corn silage production this year is also reported to be substantially smaller because of the dry conditions in key producing regions.

Delays in meat processing is also reported to be exacerbating the feed issue. Because of tight labor due to COVID-19 border restrictions, as well as outbreaks of COVID-19 amongst staff, meat processing facilities are running behind and reports are that farmers have been facing delays of more than a month in getting cows culled. This is resulting in some farmers having to use more of their stored feed on these sub-optimal cows, which otherwise would have been culled.

Figure 5 – New Zealand Imports of Palm Kernel Expeller



--Gradually Shrinking Cow Herd

New Zealand's dairy cow herd fell to 4.904 million head last year, and FAS/Wellington estimates the trend of gently declining numbers to continue this year, falling to 4.875 million. New Zealand hit "peak" cow numbers of 5 million a few years ago, and expectations are that there will continue to be a gradual downward trend in the future. This is being driven by new freshwater environmental protection regulations and the looming climate change regulations, which are expected to trigger a reduction in stocking rates. Industry analysts also report that due to these pressures, there is limited ability for New Zealand to respond to high global prices by increasing herd size. Although in the medium to longer term there is some expectation that lower cow numbers can be offset by increased productivity through greater supplementary feeding, with the elevated feed prices that is not likely an option for 2022.

Figure 6 – New Zealand Dairy Herd Numbers

Year	Total Dairy Cows
2014/15	5.018
2015/16	4.998
2016/17	4.861
2017/18	4.993
2018/19	4.946
2019/20	4.922
2020/21	4.904

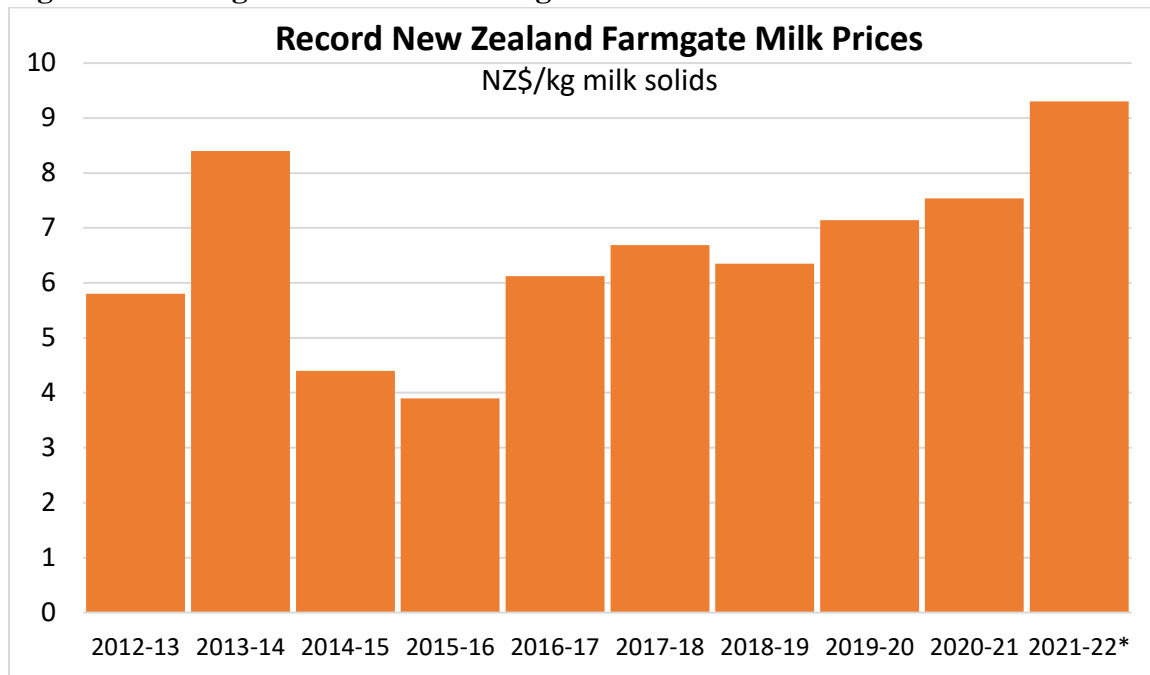
Source: New Zealand Dairy Statistics 2020-21, LIC and Dairy NZ

--Continued Tight Labor

The combination of closed international borders due to COVID-19, as well as strong demand for labor from other New Zealand industries, has resulted in a shortage of labor in the dairy industry, which is another constraint for farmers and processors. In April, the Government of New Zealand announced

border exceptions for 500 additional workers in the dairy sector, taking the total to 800 for migrant workers under this exception. However, the dairy industry has called on the government to allow even more to help alleviate staff shortages.

Figure 7 – Farmgate Milk Price of Largest New Zealand Processor



Source: Fonterra, *Forecast on May 9th, 2022

Although the above factors are negatively affecting dairy production, a key positive supporting production has been record farmgate milk prices, driven by robust global demand. These high prices for producers are expected to continue throughout the year and are helping to counteract the rising input costs. However, as mentioned, despite these high milk prices the options to boost milk production in New Zealand are limited.

2021

New Zealand's 2021 milk production finished at just under 22 MMT, similar to the previous year but lower than the previous FAS/Wellington estimate. The record level of production during the start of 2021 created expectations for a stellar production year, however dryness and other issues as explained above began to cause production to lag. In fact, starting in August 2021 every month since has had production lower than that of the previous year.

Liquid Milk Exports

FAS/Wellington's forecast for New Zealand's fluid milk exports in 2022 remains unchanged at 275,000 metric tons (MT), nearly the same as last year's total of 277,000 MT. The vast majority (about three-quarters) of liquid milk exports went to China last year

Liquid Milk Domestic Consumption

FAS/Wellington forecasts domestic fluid milk consumption in 2022 at 535,000 MT, up only slightly from the previous year as a result of population growth. Just two percent of the milk produced in New Zealand is consumed domestically as liquid milk. By comparison with other key exporters, about 28 percent of Australia's milk production is consumed domestically as liquid milk, 20 percent of U.S. production, and 16 percent of EU production. The lion's share of the milk produced in New Zealand is exported as processed dairy products.

Industry and Policy

Calves

The largest New Zealand processor announced that from June 1, 2023 they would be requiring all non-replacement calves to have to enter the value stream. This would mean that no calves would be allowed to be euthanized, and instead would either have to be slaughtered for veal, pet food, or grown out for the beef market.

Mycoplamsa bovis

In early May, the New Zealand Agricultural Minister announced that only one farm in New Zealand still had Mycoplasma bovis, and 271 farms had been cleared of it. Expectations are that the disease will be able to be completely eradicated in New Zealand. According to the Ministry of Primary Industries website, as of May 5th, 2022 over \$220 million NZD (\$140 million USD) in compensation has been provided to farmers from the Government as part of this eradication effort.

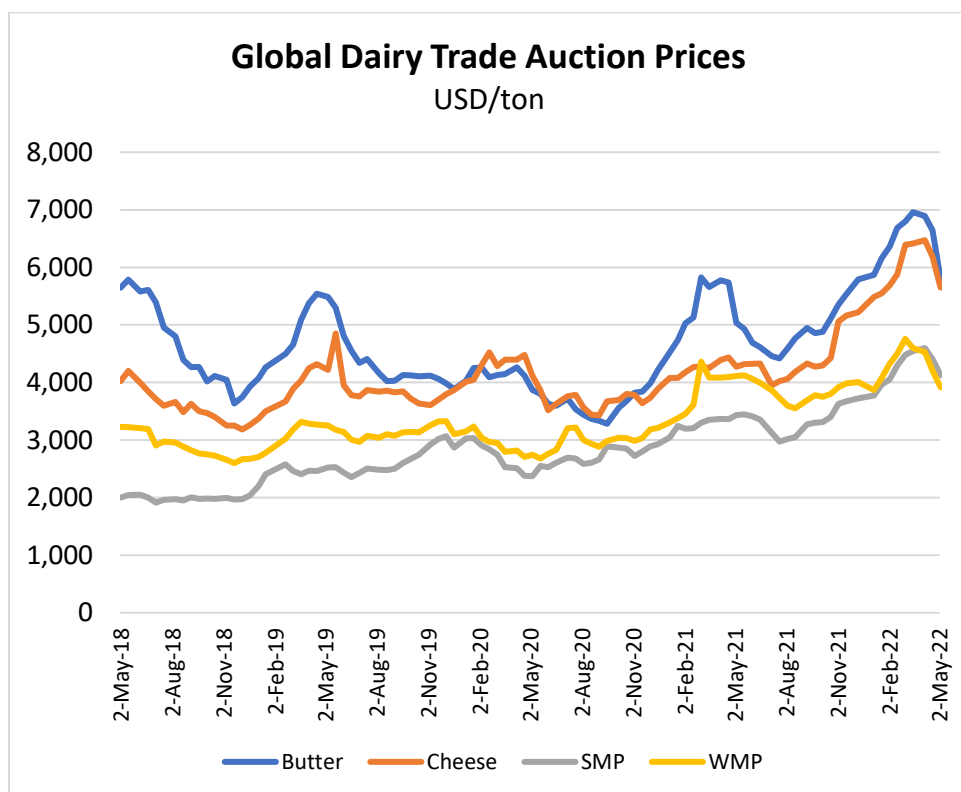
Agricultural Emissions and He Waka Eke Noa

"He Waka Eke Noa" is the Primary Sector Climate Action Partnership between 11 private-sector agricultural groups and two GONZ ministries - the Ministry of Primary Industries (MPI) and Ministry for the Environment (MfE). The "He Waka Eke Noa" program has been charged with developing a farm level system to account for, and reduce, agricultural methane and nitrous oxide emissions. Ultimately, this will lead to a methane and nitrous oxide pricing system at farm level by 2025. The timeline for their work as per their website is that in May 2022 they will present a pricing system recommendation to the relevant Ministers. By the end 2022, 100 percent of farms should know their greenhouse gas (GHG) number and by the end of 2023 a pilot project testing a system for farm-level accounting and reporting of emissions will be completed. Finally, in 2025 all farms will need to have a written plan to measure and manage their greenhouse gas emissions and the on-farm pricing system, including sequestration, will be up and running.

Production, Supply, and Distribution – Fluid Milk

Dairy, Milk, Fluid Market Year Begins New Zealand	2020		2021		2022	
	Jan 2020		Jan 2021		Jan 2022	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Cows In Milk (1000 HEAD)	4922	4922	4900	4904	4875	4875
Cows Milk Production (1000 MT)	21980	21980	22240	21995	22250	21800
Other Milk Production (1000 MT)	0	0	0	0	0	0
Total Production (1000 MT)	21980	21980	22240	21995	22250	21800
Other Imports (1000 MT)	5	5	3	2	5	5
Total Imports (1000 MT)	5	5	3	2	5	5
Total Supply (1000 MT)	21985	21985	22243	21997	22255	21805
Other Exports (1000 MT)	250	250	270	277	275	275
Total Exports (1000 MT)	250	250	270	277	275	275
Fluid Use Dom. Consum. (1000 MT)	525	525	530	530	535	535
Factory Use Consum. (1000 MT)	21101	21101	21333	21080	21335	20885
Feed Use Dom. Consum. (1000 MT)	109	109	110	110	110	110
Total Dom. Consumption (1000 MT)	21735	21735	21973	21720	21980	21530
Total Distribution (1000 MT)	21985	21985	22243	21997	22255	21805
(1000 HEAD) ,(1000 MT)						

Figure 8 – Global Dairy Trade Auction Prices



Source: GDT

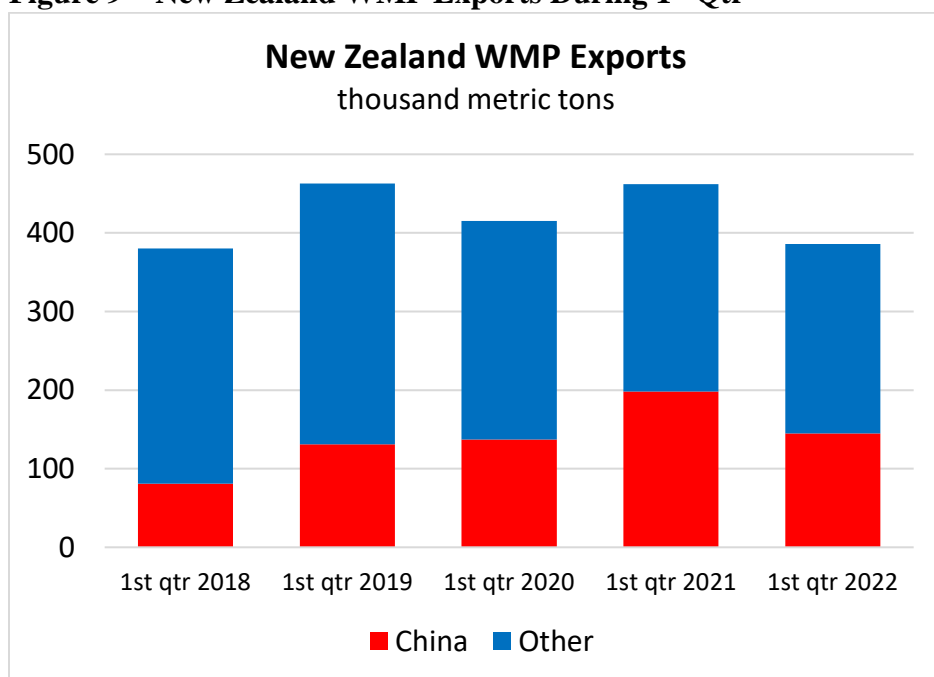
Whole Milk Powder (WMP)

FAS/Wellington's forecast for 2022 WMP production has been revised down to 1.55 MMT, three percent lower than 2021. As explained, overall milk production in New Zealand is estimated to be down in 2022, and the price of WMP relative to other products has been weaker. In fact, in recent weeks skim milk powder (SMP) prices have actually been ahead of WMP on the Global Dairy Trade auction (see Figure 8) and since the beginning of May 2021 to the beginning of May 2022, WMP prices are actually down 5 percent, while prices for SMP are up 20 percent.

Reduced import demand from China has also put pressure on WMP prices. Extensive COVID-19 lockdowns there have reduced food service activity, and as a result reports are that more local milk is flowing into powders rather than other products. It is also believed that because of a strong Chinese import program of WMP in 2021, that there had been some stock build up which is also reducing import demand.

The 2022 WMP export forecast is also revised down to 1.5 MMT, compared to 1.62 MMT last year. In the first quarter of 2022, overall New Zealand WMP exports were down 16 percent, and shipments to China were down 26 percent (see Figure 9). It is expected that reduced shipments to China will continue for the next few months, and even with a recovery later this year, overall export volumes are not expected to reach last year's record levels. Exports of all dairy products continue to be impacted by logistical challenges and shipping delays due to COVID-19, although reports are that the situation has improved.

Figure 9 – New Zealand WMP Exports During 1st Qtr



Source: TDM LLC

2021 WMP exports reached a record level of nearly 1.62 MMT and China accounted for over half of all shipments. UAE, Sri Lanka, Bangladesh, and Indonesia were the next largest markets, but each of these accounted for only five percent or less of shipments.

Production, Supply, and Distribution – WMP

Dairy, Dry Whole Milk Powder Market Year Begins New Zealand	2020		2021		2022	
	Jan 2020		Jan 2021		Jan 2022	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Beginning Stocks (1000 MT)	150	150	171	171	150	138
Production (1000 MT)	1570	1570	1615	1600	1600	1550
Other Imports (1000 MT)	2	2	2	2	3	2
Total Imports (1000 MT)	2	2	2	2	3	2
Total Supply (1000 MT)	1722	1722	1788	1773	1753	1690
Other Exports (1000 MT)	1533	1533	1620	1617	1600	1500
Total Exports (1000 MT)	1533	1533	1620	1617	1600	1500
Human Dom. Consumption (1000 MT)	2	2	2	2	2	2
Other Use, Losses (1000 MT)	16	16	16	16	16	16
Total Dom. Consumption (1000 MT)	18	18	18	18	18	18
Total Use (1000 MT)	1551	1551	1638	1635	1618	1518
Ending Stocks (1000 MT)	171	171	150	138	135	172
Total Distribution (1000 MT)	1722	1722	1788	1773	1753	1690
(1000 MT)						

Cheese

FAS/Wellington's forecast for New Zealand cheese production for 2022 is revised down slightly to 380,000 MT, unchanged from the revised 2021 figure. Despite lower milk supply, it is expected that processors will likely prioritize cheese rather than WMP as a result of strong prices. At the Global Dairy Trade Auction, cheddar cheese prices have increased nearly 40 percent over the last year.

Cheese exports are forecast to remain relatively steady at 355,000 MT in 2022. During the first quarter of 2021, exports were just 2 percent below the pace of last year. Although shipments to China and Australia were down, these were largely offset by stronger exports to Japan.

New Zealand's 2021 cheese exports reached a record 358,000 MT, up nearly 10 percent from the previous year. China was the largest market (accounting for 25 percent), followed by Japan (16 percent), Australia (11 percent) and South Korea (seven percent).

Production, Supply, and Distribution – Cheese

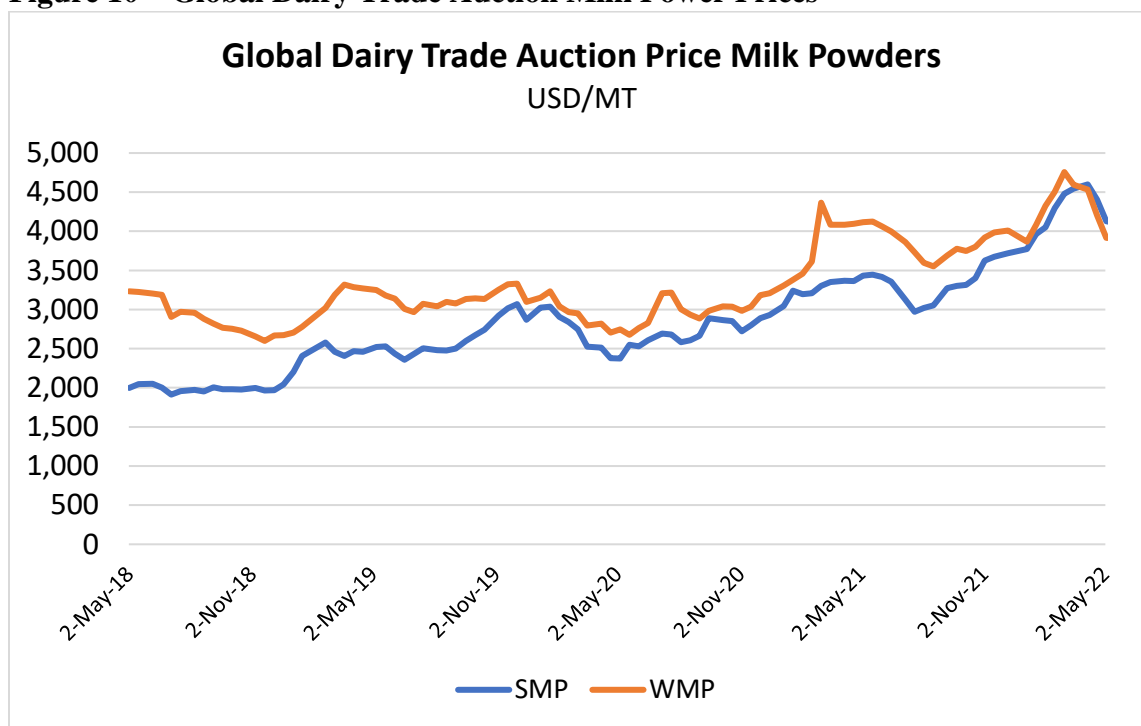
Dairy, Cheese Market Year Begins New Zealand	2020		2021		2022	
	Jan 2020		Jan 2021		Jan 2022	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Beginning Stocks (1000 MT)	73	73	68	68	60	63
Production (1000 MT)	350	350	390	380	385	380
Other Imports (1000 MT)	10	10	12	11	12	12
Total Imports (1000 MT)	10	10	12	11	12	12
Total Supply (1000 MT)	433	433	470	459	457	455
Other Exports (1000 MT)	327	327	372	358	355	355
Total Exports (1000 MT)	327	327	372	358	355	355
Human Dom. Consumption (1000 MT)	38	38	38	38	42	42
Other Use, Losses (1000 MT)	0	0	0	0	0	0
Total Dom. Consumption (1000 MT)	38	38	38	38	42	42
Total Use (1000 MT)	365	365	410	396	397	397
Ending Stocks (1000 MT)	68	68	60	63	60	58
Total Distribution (1000 MT)	433	433	470	459	457	455
(1000 MT)						

Skim Milk Powder (SMP)

The FAS/Wellington forecast for New Zealand's 2022 SMP production has been revised slightly down in light of the reduced milk supply but is still expected to be up six percent from 2021. SMP prices have remained strong, and even have been above WMP at recent GDT auctions (see Figure 10). This indicates strong global demand, and in the first quarter of 2022 New Zealand SMP exports were up nearly 16 percent. This was despite lower shipments to China, as sharply higher sales to Southeast Asia (Indonesia, Thailand, and Malaysia) more than offset reduced Chinese shipments. There are also reports that less EU SMP is boosting demand for New Zealand products. The FAS/Wellington forecast for 2022 SMP exports is unchanged at 355,000 MT, and if realized this would be up nine percent from 2021.

Final 2021 SMP exports fell to only 326,000 MT, the lowest export level since 2008. Production and exports declined last year as the value of the SMP and the fat production stream (butter, anhydrous milkfat, and UHT cream) was not as attractive compared to WMP. China remained the largest market for New Zealand SMP exports (42 percent), followed by Indonesia (nine percent), Thailand (seven percent), and Malaysia (seven percent).

Figure 10 – Global Dairy Trade Auction Milk Power Prices



Source: GDT

Production, Supply, and Distribution – SMP

Dairy, Milk, Nonfat Dry Market Year Begins New Zealand	2020		2021		2022	
	Jan 2020		Jan 2021		Jan 2022	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Beginning Stocks (1000 MT)	116	116	116	116	91	113
Production (1000 MT)	362	362	330	330	355	350
Other Imports (1000 MT)	8	8	10	8	10	10
Total Imports (1000 MT)	8	8	10	8	10	10
Total Supply (1000 MT)	486	486	456	454	456	473
Other Exports (1000 MT)	356	356	350	326	355	355
Total Exports (1000 MT)	356	356	350	326	355	355
Human Dom. Consumption (1000 MT)	14	14	15	15	15	15
Other Use, Losses (1000 MT)	0	0	0	0	0	0
Total Dom. Consumption (1000 MT)	14	14	15	15	15	15
Total Use (1000 MT)	370	370	365	341	370	370
Ending Stocks (1000 MT)	116	116	91	113	86	103
Total Distribution (1000 MT)	486	486	456	454	456	473
(1000 MT)						

Butter and Anhydrous Milk Fat (AMF)

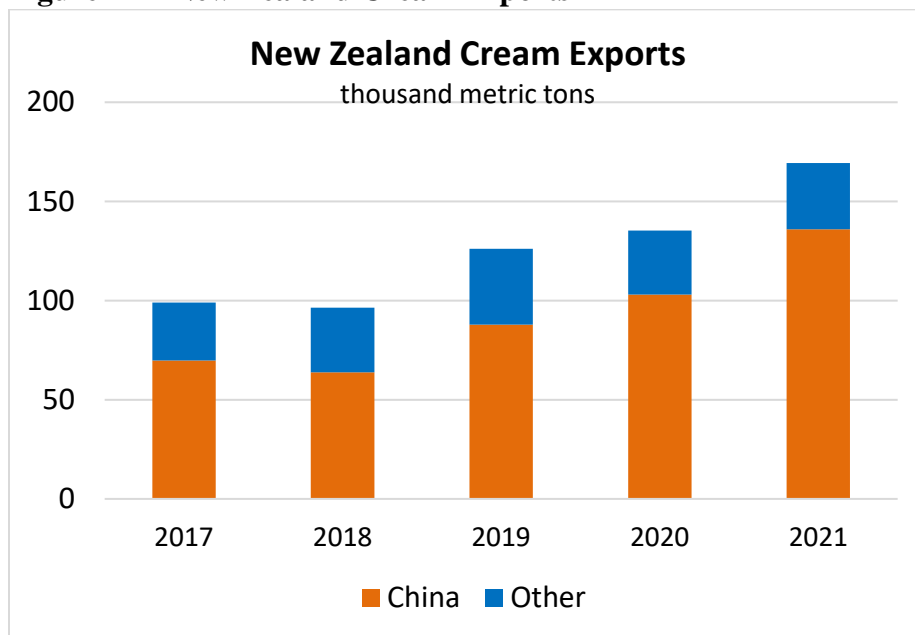
Despite lower milk supply, the relative strength of the prices of SMP and the fat production stream (butter, anhydrous milkfat and UHT cream) this year compared to WMP is expected to result in slightly higher butter production in 2022. FAS/Wellington estimates 2022 butter production at 480,000 MT, slightly below the earlier estimate but two percent higher than 2021. Further growth expansion in butter

is limited by the rapid growth of New Zealand UHT cream exports (see Figure 11). These cream exports climbed to a record level last year and are up another seven percent during the first quarter of 2022.

The butter export forecast is also slightly lowered to 450,000 MT, but still up three percent from 2021. Exports during the first quarter of 2021 were nearly identical to the same period last year, with greater shipments to China offsetting lower exports to Australia and Philippines.

New Zealand's 2021 butter exports fell to only 436,000 MT, the lowest level in over a decade. China remained the largest market, accounting for 25 percent of shipments, followed by Australia (seven percent), Philippines (seven percent) and Saudi Arabia (six percent).

Figure 11 – New Zealand Cream Exports



Source: TDM LLC

Production, Supply, and Distribution – Butter

Dairy, Butter Market Year Begins New Zealand	2020		2021		2022	
	Jan 2020		Jan 2021		Jan 2022	
	USDA Official	New Post	USDA Official	New Post	USDA Official	New Post
Beginning Stocks (1000 MT)	93	93	93	93	98	97
Production (1000 MT)	500	500	470	470	485	480
Other Imports (1000 MT)	1	1	1	1	1	1
Total Imports (1000 MT)	1	1	1	1	1	1
Total Supply (1000 MT)	594	594	564	564	584	578
Other Exports (1000 MT)	471	471	435	436	455	450
Total Exports (1000 MT)	471	471	435	436	455	450
Domestic Consumption (1000 MT)	30	30	31	31	32	32
Total Use (1000 MT)	501	501	466	467	487	482
Ending Stocks (1000 MT)	93	93	98	97	97	96
Total Distribution (1000 MT)	594	594	564	564	584	578
(1000 MT)						

Attachments:

No Attachments