

FOOD AND NUTRITIONAL

Supply Chain Outlook 2023

JANUARY - ISSUE 23



ECONOMY

- INFLATION SLOWS
- CHINA TENSIONS COULD CAUSE VITAMIN SUPPLY ISSUES

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Pricing Trends Key

- Price Increase 
- Price Increase Due to Current Events 
- Price Stable 
- Price Decrease 

Economic Update

The U.S. economy had a relatively strong month in December, with 3Q GDP revised upward to +3.2% following slightly negative quarters in Q1 & 2. Inflation, as measured by the CPI, slowed to 7.1%, the fourth monthly decline in a row, and unemployment fell slightly to 3.5%, a 53-year low. 223,000 jobs were added in December and there are still two jobs available for every worker who wants one. Wage growth slowed to 0.3% in December, which may give the Fed reason to slow their interest rate hikes a bit if this is sustainable. In total, 4.5 MM jobs were added in 2022 following 2021's 6.7MM jobs. We are back to pre-pandemic levels for the most part.

The cooling off of the labor market may be evidence that the Fed's tightening strategy is starting to have an effect on the economy. The Fed raised rates seven times in 2022, including a 50-basis point increase in December following four consecutive 75 basis point hikes to a target range of 4.25-4.50%. It also signaled that the next increase in February could be a slower pace of 25 basis points, but that their goal in 2023 could exceed the 4.6% top previously indicated, possibly as high as 5.6%.

Grocery prices increased 13% year-on-year in December and gasoline prices fell to an average of \$3.16/gallon, down from \$5.02/gallon in mid-June. The crude oil market price fell to ~\$80/barrel, where prices had rebounded to near \$120/bbl in the wake of OPEC+ production cuts and proposed new sanctions on Russian oil. Poor demand and a relatively mild winter in the Northern Hemisphere allowed this market to finish the year only about \$5/barrel more expensive than in early January 2022.

U.S. Healthcare spending increased 2.7% in 2021 to reach \$4.3 TR, about 18.3% of GDP. This follows 2020's hike of 10.3% due to Covid-19. This trend is helping the dietary supplement and functional food industries attract new consumers more than ever. Prevention of chronic disease and focus on healthy aging and immunity will continue to boost our fortunes in the years ahead.

U.S. Manufacturing PMI dipped to 48.4 in December which raises concerns that a recession may be in

our future. Hopefully, it will be mild in intensity and short in duration. S&P's Global PMI fell to 44.6, a four-month low. The Conference Board's Consumer Confidence Index hit 108.3 in December as consumers continue to spend down savings and dip into credit cards to facilitate spending. U.S. households now hold \$1.7 Tr in savings down from \$2.3 Tr in late 2021. Revolving credit balances rose 8.7% annual basis in December to \$1.16 Tr, an all-time high. The rate on 30-year fixed mortgages hit 7.08%, a 20-year high. The financial markets have been devastated this year with all major averages under water. YTD as of 12/31/22:

- S&P 500: -19.4%
- DJIA: -8.8%
- NASDAQ: -33.1%

Global Markets

Global markets lost about \$30 TR in value and cryptocurrencies shed \$1.7 TR, about 60% down from their peak in November 2021. The U.S. Dollar has started to weaken, but ends the year up about 8.4%. It is down a bit from its peak in mid-September which may give other economies some breathing space. In the meantime, the latest forecasts from the Fed as well as some well-respected private economic consulting firms show U.S. GDP growing only 0.5-1.0% b-n 2023 and 2024.

China

Aside from current economic data, there is growing geopolitical tension growing between the U.S and China on many levels such as Taiwan independence, freedom of navigation in the South China Sea, human rights abuses, tacit support of Russian behavior in

Ukraine and many other issues. Keeping in mind that China is by far the major manufacturer of vitamins and many other nutrients, this is the longest-term issue we as an industry face. We hope that cooler heads will prevail. Xi Jinping recently installed himself for a third term as President and will really be the only voice that matters in China for the foreseeable future. There is no heir apparent, and the emphasis in his thinking has shifted from economic well-being

for his people toward a purely political focus on party loyalty.

REAL THREATS TO THE VITAMIN SUPPLY CHAIN ARE HAPPENING

CURRENT EVENTS

- UKRAINE - RUSSIA TENSIONS INCREASE
- CHINESE LIFT LOCKDOWNS

Coronavirus

- XBB.1.5 now accounts for 27.5% of U.S. cases and may be as high as 75% in the Northeast region. There are now 650 separate omicron variants and the fear is that many more may be coming out of China as the year progresses.
- In addition to Covid, the seasonal flu H3N2 is the worst in ten years. RSV infections, which affect mainly children and others with underdeveloped immune systems, seem to be waning, but we are not out of the woods yet. Drug shortages are becoming a major problem, especially for children. Everyday products like analgesics, antibiotics and other cold/flu products are hard to find.

Chinese Re-Opening: COVID-19 Pandemic Lingers

- China has finally scrapped all Covid-related testing and other restrictions following strong protests from quarantined citizens and business leaders who found it impossible to function under Xi's "zero-Covid" policies. The Chinese New Year which starts on January 21 threatens to become the ultimate super-spreader event in history as urban people travel back to their rural hometowns to celebrate the holiday, also for the first time in three years.
- Factory shutdowns, logistical bottlenecks and port problems due to labor shortages due to illness will increase as the winter progresses and the country struggles to recover following Chinese New Year. Emergency rooms and crematoria are already backed up, and the lack of transparency from the Chinese government is making the situation worse. The U.S., France, Israel and about a dozen other countries are implementing special testing requirements on visitors from China.

Ukraine & Russia

- Ukrainian forces are making gains in the east and south, with the recent withdrawal of Russia's forces from the region of Kherson, a major blow to Putin as this was the first provincial capital taken in the February invasion. It follows on Ukrainian success in the Kharkiv region earlier this fall. His failure to make military progress and rising tensions at home has led to a strategy of bombing civilian residences and infrastructure targets.
- Since the beginning of the invasion, this last week has seen the most ambitious ground assaults by the Ukrainians, following sustained attacks on command posts, ammunition stores, and fuel reserves far behind the front lines. It is estimated that Russia has suffered 100,000 killed, missing or wounded since the conflict was initiated by Russia.
- So far, the Western alliance is holding together and more sophisticated weapons systems are being supplied to Ukraine. Lots of risks are apparent here. As global economy slows and as mild winter weather still prevails, there is less risk to the energy complex, but there remains a food crisis should Black Sea ports stop functioning in the wake of renewed fighting.

Trade

- The incredible strength of the U.S. Dollar has upended trade to a great extent. Earlier in the year the dollar hit a 32-year high against the yen and was trading near parity with the euro. European Union GDP is growing at 2.1% year-on-year and inflation hit 10.7% in October. Their energy picture is more severe than in the U.S., although natural gas stockpiles are now at about 94%, with alternative suppliers of liquified natural gas (LNG) making up for Russian cutbacks. The relatively mild winter, at least so far, is helping the situation, as is the slowing of the economy.
- Ocean freight rates have fallen to close to pre-pandemic levels. The World Container Index is down 77% in 2022. The Danish shipping giant, Maersk, forecasts a 2-4% decline in shipping demand for 2023. The World Trade Organization projects only a 1% increase in goods shipments in 2023, down from 3.5% in 2022. According to a recent article in Food Business, supply chain executives do not see a return to normal conditions until late-2024 or 2025. Another aggravating factor is the shortage of local truck drivers and warehouse space as inventories swell under the threat of coming recession.
- China's abrupt elimination of Covid restrictions will continue to cause disruptions in factory output and logistics functioning. Chinese factories have been shutting down two weeks earlier than usual prior to Chinese New Year due to workforce illnesses as well as falling demand for goods. U.S. manufacturing orders are down 40% in the prior quarter and large employers such as FoxConn suddenly have new competition from other manufacturers in other countries, whereby they had almost a monopoly in producing Apple's iPhones up until now. Geopolitical tensions are causing companies outside China to reconfigure their supply chains.

Demographics is Destiny: The Aging of the Global Population

- The world population hit 8B in 2022. Since 1975, about one billion new people have been added every 11-12 years. It will take 15 more years to hit 9B and another 22 years to hit 10B.
- Globally, those over 65 years of age now outnumber those under 5. By 2065, they will outnumber those under 18. Birth rates, especially in developed countries are falling and life expectancy, aside for distortions caused by pandemic deaths, are generally increasing. The over-65 population is expected to shift as noted below between 2019 and 2050:
- In the U.S., population growth was only 0.4% in 2022 up slightly from 0.2% in 2021. The population is now 333.3 MM and most of the gain was from immigration. Life expectancy fell to 76.4 years, the lowest level since 1996. Covid was the third leading cause of death in 2022. The fertility rate fell to 1.66 babies per woman, whereby 2.1 is the population replacement rate. Other developed countries, especially Italy and Japan have even worse numbers. The U.S. median age is now ~39, up from 28 in 1970. By 2040, those Americans over 65 will outnumber those under 18. Who will there be who can pay for all these retirees?
- All these factors make solving our border crisis in a sensible way more critical than ever, especially as the current workforce ages out and government retirement and healthcare programs like Social Security and Medicare/Medicaid tetter on the brink of bankruptcy.

FAT SOLUBLE

VITAMINS

Trending Vitamins:

- FOLIC ACID
- CYANOCOBALAMIN
- VITAMIN C
- VITAMIN D

Vitamin A: Prices for Vitamin A have stabilized despite tightened supply due to European producer supply constraints. DSM shut down its Sisseln, Switzerland plant and Adisseo Bluestar has shuttered its French feed grade plant due to falling demand on the feed side. Producers had scheduled extended maintenance shutdowns this summer, in part to tighten the market.

Vitamin D: Prices on Vitamin D have remained stable to down in the face of capacity increases. Feed industry especially weak.

Vitamin E: Demand is stronger than supply across the market. Price is trending up due to energy and logistical issues stemming from the War in Ukraine. Signs of some weakening in China for the same reasons as with Vitamin A. Natural VE is extremely tight and expensive.

Vitamin K: Current pricing for vitamin K1 is stable. Most users prefer a 1% or 5% trituration. New uses in bone health and other condition-specific formulations, especially with vitamin K2, is making this formerly minor vitamin a more interesting story. Pricing and demand are stable. Vitamin

K3 remains tight and is the only Chinese vitamin to increase in price during 2022.

An already stressed global food supply chain could see further disruption because of Russia invading Ukraine.

Pricing Trends Key

- Price Increase 
- Price Increase Due to Current Events 
- Price Stable 
- Price Decrease 



VITAMINS CONT.

Trending Vitamins:

- FOLIC ACID
- VITAMIN C
- CYANOCOBALAMIN
- VITAMIN D

Vitamin C: Vitamin C prices are continuing to increase significantly due to tight supply and increased shipping costs. Demand has also spiked in China as consumers there look to improve their immune systems as Covid spreads. This is one product to watch closely in the coming weeks and months, especially as some capacities have been taken off-line, including DSM Jiangshan. Supply is currently adequate and several new entrants may start to pressure pricing as we enter 2023-2024.

tightened up. Longer term, oversupply is developing.

Vitamin B5 (Calcium Pantothenate): Intermediate shortage leading to a significant swing in price. This is causing volatility across the market for B5. Pricing has been dropping slightly from the high averages of this year.

Vitamin B6 (Pyridoxine): B6 pricing has been stable as supplies have improved and demand has decreased.





Vitamin B7 (Biotin): After reaching exceptionally high prices in 2020, B7 prices began to fall and have now stabilized at a low level.

Vitamin B9 (Folic Acid): The B9 market is displaying volatility; prices are currently on the rise due to raw material availability and logistics-related issues. Feed industry remains very weak.

Vitamin B12 (Cyanocobalamin)

The B12 market is stable but prices are expected to rise due to increased raw materials costs.

Pricing Trends Key

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Vitamin B1 (Thiamine):

The B1 market has stabilized at a low price. All manufacturers are producing and several new entrants coming.

Vitamin B2 (Riboflavin):

Riboflavin USP and food grade pricing are firm, and supplies are adequate. Several new entrants have begun manufacturing and potential capacity increases can be expected by the majors.

Vitamin B3 (Niacin/

Niacinamide): Pricing has stabilized in recent months even as pyridines have



MINERALS

- SOME MINERALS HAVE SEEN PRICE INCREASES
- PRODUCTION AND TRANSIT ISSUES ARE PART OF ESCALATION

Trending Minerals

- Iron
- Magnesium Sulfate
- Magnesium Oxide
- Magnesium Citrate
- Zinc Gluconate
- Zinc Citrate
- Zinc Oxide

Calcium Carbonate: Visit the Granulations section on page 10 for more information about our directly compressible version of SuperTab® oyster shell calcium carbonate.

- SuperTab® Oyster Shell Granulation (OSG) 2000 AM
- SuperTab® Oyster Shell Granulation 2100 Malto
- SuperTab® Oyster Shell Granulation 2300 Acacia

Copper: Prices have stabilized but demand remains high.

Iron: Iron prices have stabilized after volatility and increases were experienced at the beginning of the year. Supply and lead times have normalized since early 2022 as well.

Electrolytes

Calcium: Prices have started to stabilize after steady increases in the first half of the year.

Magnesium: Magnesium market price and supply are stable.

Potassium: Potassium prices and availability are stable.

Phosphorus: Global demand and pricing continue to increase.

Sodium: Sodium prices have stabilized as supply constraints have loosened due to improvements in logistical landscape.

Zinc

Zinc prices have stabilized however prices are expected to rise into the end of Q4 / early 2023.

Zinc Gluconate: The price of Zinc Gluconate is stable and lead times have normalized.





Zinc Oxide: Prices for Zinc Oxide have decreased off of summer highs and are beginning to stabilize.

Zinc Sulfate: Zinc Sulfate prices remain stable and lead times have normalized.

Zinc Ascorbate: Prices are increasing due to increased energy costs and tightened supply.

Zinc Citrate: Prices are on the rise with longer lead times continuing.

Pricing Trends Key

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- Price Decrease 

MINERALS^{CONT.}

- SOME MINERALS HAVE SEEN PRICE INCREASES
- PRODUCTION AND TRANSIT ISSUES ARE PART OF ESCALATION

Chelates

Zinc Amino Acid Chelate: Prices and lead times for zinc amino acid are increasing.



Zinc Bisglycinate Chelate: Prices for zinc bisglycinate are increasing and lead times are longer than average.



Zinc Glycinate Chelate: Copper Glycinate prices are stable and expected to remain so.



Copper Glycinate Chelate: Copper Glycinate prices are stable and expected to remain so.



Manganese Amino Acid Chelate: Manganese Amino Acid shows an increase due to raw material availability and longer than average lead times.



Pricing Trends Key

Price Increase

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Price Decrease

Trace Minerals

Chromium: Chromium prices remain stable but can be difficult to source due to long lead times.



Molybdenum: Lead time and prices remain stable.



Selenium: Lead time and prices remain stable.



PREMIXES

- MANUFACTURERS ARE SWITCHING TO PREMIXES
- PANDEMIC HAS CHANGED THE WAY PROVIDERS OFFER SERVICES

Custom Nutrient Premixes

More and more manufacturers are switching to vitamin and mineral premixes. Premixes consolidate multiple nutrients into a quality-assured, single-step ingredient and deliver economies of scale by simplifying ingredient procurement from a single source.



TWG SuperBlend®

Our value-added SuperBlend® custom nutrient premixes deliver performance and stability in high temperature and shear processes in a variety of food and beverage products, including:

- Extruded bars
- Gummy supplements
- Breakfast cereals
- Ready to drink beverages
- Beverage mixes



MICROENCAPSULATION

- AN EFFECTIVE METHOD OF MASKING UNWANTED FEATURES
- DELIVER A WIDE-RANGE OF FUNCTIONAL INGREDIENTS



Microencapsulation Technology

Vitamins, minerals, and other nutrients possess unique characteristics that can affect the appearance, color, and odor of the final product. Microencapsulation is an effective method of masking unwanted sensory characteristics while maximizing nutrient function.

SuperCoat®, our most recent innovation using our proprietary SMART™ process, envelops particles at the microscopic level in a protective shell. This value-added coating technology delivers superior performance and stability of essential nutrients for a wide range of multi-functional ingredients.

Trending Microencapsulated Nutrients:

- Vitamin C
- Vitamin B5 (Calcium Pantothenate)
- Vitamin B9 (Folic Acid)

With a diverse portfolio of products, TWG Health + Nutrition is one of only a select group of manufacturers with the technology and resources to deliver independent manufacturing of custom premixes, microencapsulated nutrients, and granulations.

Our comprehensive supply chain and extensive list of pre-qualified ingredients allows us to react quickly to changing market trends and help you keep up with consumer demand. We also understand that superior service is just as important as technology and expertise. That's why we provide you with prompt quotations, technical assistance, and support documentation to help you efficiently deliver your products on time. Contact us today to talk to one of our experts about your project needs or ask about any ingredients not listed here.



GRANULATIONS

- DELIVER ESSENTIAL NUTRIENTS IN GRANULAR POWDERS IDEAL FOR HIGH SPEED TABLETING
- CAN BE INCORPORATED INTO DRUM-TO-HOPPER TABLET BLENDS



Granulations

Rather than outsource granulations from a third-party manufacturer, TWG Health + Nutrition has committed to developing technologies and processes in-house to effectively and efficiently manufacture **SuperTab® direct compressible granulations**.

SuperTab® granulations deliver essential nutrients in uniform, free-flowing, granular powders ideal for high speed tableting processes. As usual TWG Health + Nutrition combines quality, innovation and superior knowledge to make sure your product is the best it can be. Ask about our granulation capabilities today!

Trending Granulations:

- Glucosamine
- Chondroitin
- Vitamin C

Oyster Shell Granulation

SuperTab® Oyster Shell calcium carbonate is sourced from an above sea level deposit, characterized as fossilized oyster shell beds. These oyster shell beds have been thoroughly vetted over the past ten years with testing of the material both analytically and physically to insure consistency and purity. TWG Health + Nutrition sources the high purity genuine shells exclusively from a domestic supplier.

Contact us today to get started on your next dietary supplement product containing calcium carbonate granulations. Insist on SuperTab® Oyster Shell authenticity in your formulation.



blending performance & stability

For over 100 years TWG Health + Nutrition has
utilized our extensive ingredient knowledge
to consistently deliver quality- assured
custom nutrient premixes,
microencapsulations, and granulations.



Call us: **(800) 201-3096**

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