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Energizing food inflation

by Benjamin Tal benjamin.tal@cibc.com and Katherine Judge katherine.judge@cibc.com

Nobody knows how long the current oil shock will last. While the consensus is that the war itself might end in the coming weeks, it is far from clear that the Strait of Hormuz will be as open as it was pre-war, with the risk premium associated with Middle East oil remaining elevated. Therefore it's not unreasonable to expect oil prices to remain elevated over the balance of the year, with the futures market now pricing in a \$75 WTI barrel around the end of 2026 — roughly 20% higher than the price seen before the conflict. Should there be material damage to the oil production and distribution infrastructure, even a quick end to the conflict would leave a longer path back to pre-war supply conditions. There are of course major macroeconomic implications of such a shock, with a critical one being on the agrifood industry.

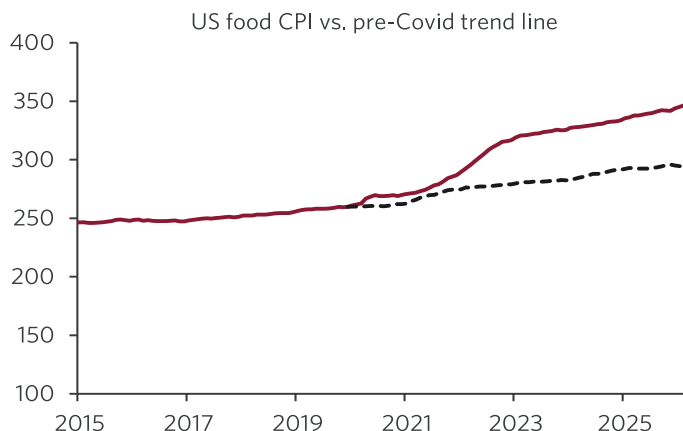
Agrifood industry — highly energy intensive

The modern agrifood industry is built on the foundation of cheap energy, a dependency that has only grown as the sector

strives to maximize yields on a fixed amount of arable land. However, while oil prices remain elevated, that model faces cost pressures. Agriculture is highly energy-intensive, so as energy costs climb, so does the cost of producing and delivering food. What makes the current surge in oil prices even more significant is the fact that it is occurring in the midst of planting season, and food prices are already almost 20% above their pre-Covid trend line (Chart 1).

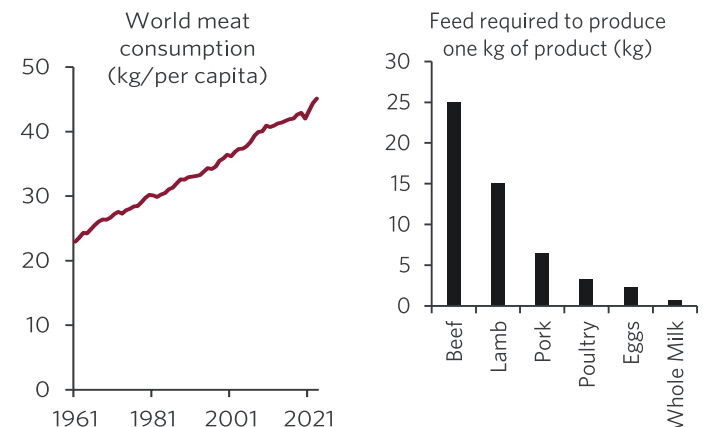
The food market is already in a state of disequilibrium. Global meat consumption has been growing much faster than population growth, reaching 45kg per person annually, up from 28kg in the 1970s and 31kg in the 1980s. That surge in meat consumption has driven even faster increases in demand for grains and protein feed (Chart 2). Additionally, beef prices were temporarily boosted recently by drought conditions in North America that drove up feed costs, forcing ranchers to pare back their herds as a result, which has resulted in smaller herd sizes.

Chart 1: Food prices have already escalated



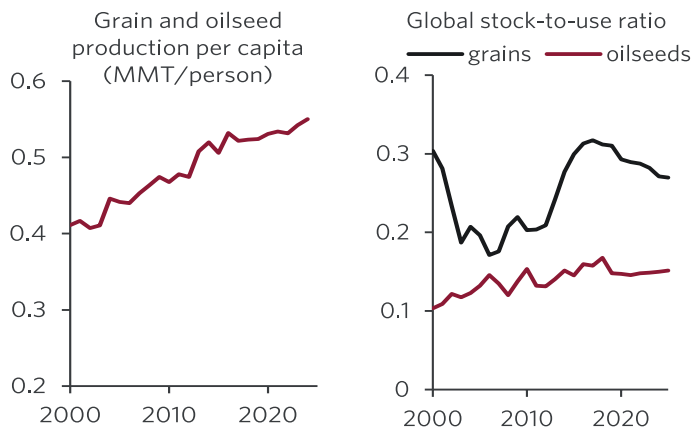
Source: BLS, CIBC

Chart 2: More meat being consumed per person (l), increasing demand for feed (r)



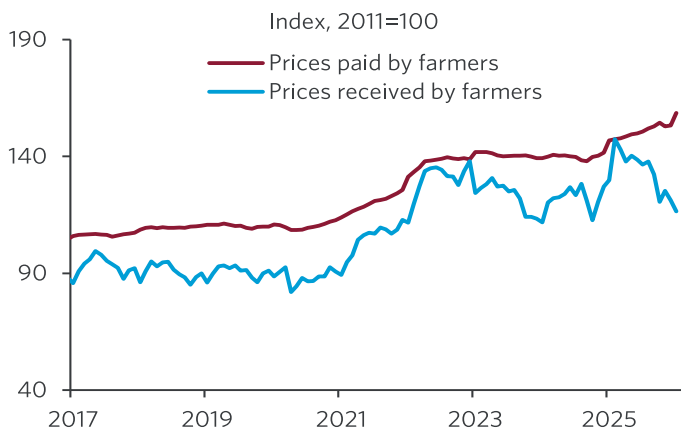
Source: Food and Agriculture Org. of the UN (FAO), Alexander et al. (2016), CIBC

Chart 3: Despite increase in grain/oilseed production per capita (l), stocks have been lean (r)



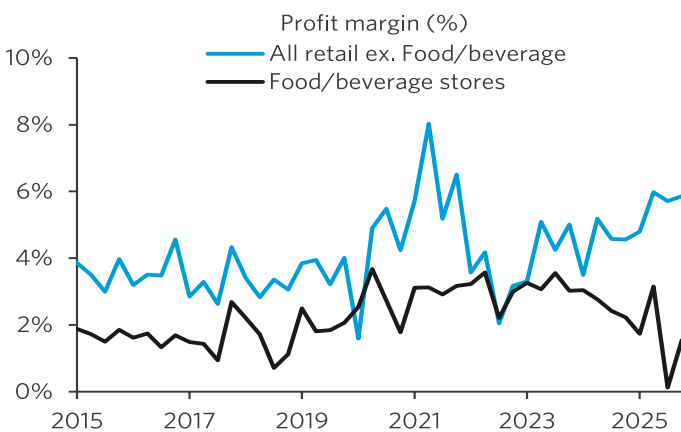
Source: USDA, CIBC

Chart 4: Farmers haven't passed through higher production costs lately



Source: USDA, CIBC

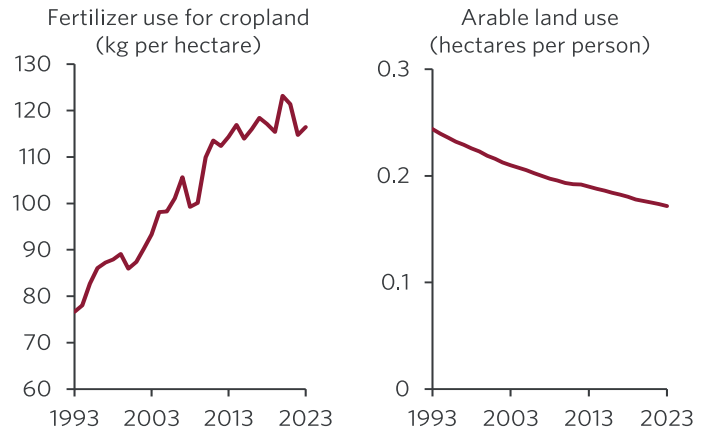
Chart 5: Grocery store profit margins are already slim



Source: US Census Bureau, CIBC

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Chart 6: Greater use of fertilizers (l), has helped to offset decline in arable land use (r)



Source: FAO, CIBC

Global consumption of grains and oilseeds has increased steadily, putting pressure on the stock-to-use ratio for both in recent years despite climbing production (Chart 3). Adding to this dynamic is the rise of ethanol production, which has further tightened food supplies. While higher food prices might seem beneficial for farmers, in reality, their input costs have risen much faster than prices received lately (Chart 4), implying limited ability by farmers to absorb the current energy-fueled cost increases. The same is true further downstream in the supply chain, with grocery stores seeing significant profit margin compression in recent years (Chart 5).

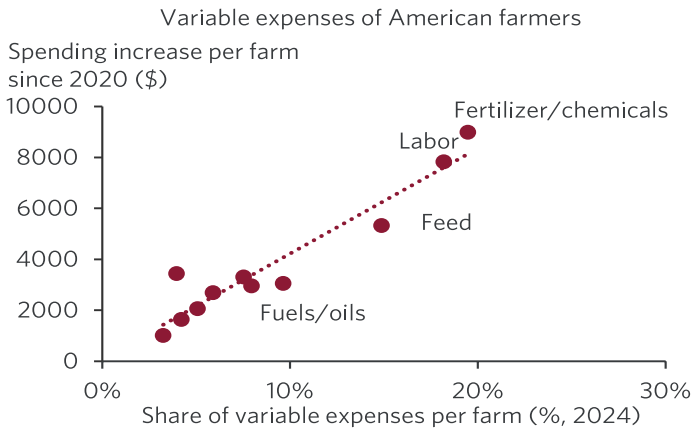
Growing focus on yields

For decades, the primary response to growing food demand has not been to expand farmland, but to maximize yields through the increased use of fertilizers and other chemicals including pesticides, while arable land use has declined due to a combination of soil degradation, urban growth, and efficiency improvements in farming (Chart 6). Synthetic fertilizers now account for 40% of variable farming costs, twice the share seen in the 1980s. And this strategy has worked: real value added of American farms has increased by almost 30% in the past two decades, helping to maintain stable per capita food production.

That efficiency improvement, however, is based on increased usage of energy. Natural gas is used as a raw material for both fertilizers and pesticides and as fuel for every stage of production, processing, and distribution. Agrifood as a whole accounts for around 15% of annual energy usage in the US, driven by the energy-intensive production of fertilizers. Fertilizers are the single largest variable expense for American farmers, narrowly surpassing labor costs, and price increases in fertilizers have been the most significant amongst categories since Covid (Chart 7).

The US is now the world's second largest fertilizer importer and natural gas is an important feedstock for fertilizers. Shocks to the system have historically seen fertilizer prices climb notably, with the start of the war in Ukraine seeing global fertilizer prices

Chart 7: Fertilizer costs were already high ahead of oil-price shock



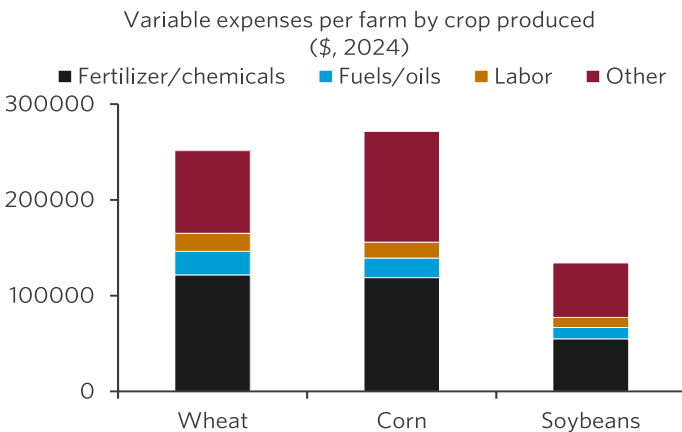
Source: USDA, CIBC

rise by 30% in early 2022 on tighter supplies due to sanctions on Russian exports and a surge in the price of natural gas. And the international cost of natural gas has jumped recently on the closure of the Strait of Hormuz in the Middle East, disrupting exports of those products. Still, since many North American farmers have already contracted for this year’s fertilizer needs, any cost increase could be a story for 2027 if the closure persists.

Fertilizers, chemicals, and direct energy costs now make up a significant portion of operating expenses for various crops — 58% for wheat, 51% for corn, and 50% for soybeans (Chart 8). Looking at indirect exposure to energy through the production of fertilizers and chemicals suggests that 50-70% of the total energy used in wheat and corn production is tied to fertilizers/chemicals. On average, producing a hectare of crops requires twelve different energy inputs, and about two kilocalories of fossil fuel energy are needed to harvest one kilocalorie of food.

While past decades saw notable improvements in agricultural energy efficiency, progress has slowed dramatically lately, and

Chart 8: Staple crop expenses are tilted towards energy-sensitive goods



Source: USDA, CIBC

further gains are increasingly difficult to achieve given the central role of fertilizer in total energy consumption.

Transportation, or “food miles”, is another key component of the agrifood system’s energy use. The distance food travels from production to consumption has increased, driven by imports and the trend toward larger, more centralized farms. US imports of agricultural products have risen by 60% in the past decade alone, or 51% on a per-capita basis.

Adding it all up, based on analysis by the Federal Reserve, we estimate that a 20% increase in the price of oil raises the food CPI by roughly 0.6ppts, 8 quarters after the shock. American farmers may be able to mitigate some of that impact by deferring purchases of phosphate and potash, and pivoting to soybean production in order to reduce spending on nitrogen-based fertilizers. However, with urea prices roughly 40% above pre-war levels, some pass through is imminent, with farmers and grocers having limited ability to absorb cost increases in already lean margins, something that government aid may be able to partly offset. An additional upside risk to food prices that isn’t captured by the Fed analysis is tied to the disruption of fertilizer shipments, which will in turn impact food producers globally and weigh on 2026 production. That implies falling inventories this year, which will result in higher food costs in 2027.

It is possible that this article will have a relatively short shelf life if oil prices return quickly to their pre-war level. However, the longer the price pressures are sustained, the more we have to look at the secondary impacts of higher energy prices. The high energy-intensity of agrifood means that food inflation will be one of the major casualties of the current oil price shock, lifting already high food prices even higher.

Contacts:

Avery Shenfeld
avery.shenfeld@cibc.com

Benjamin Tal
benjamin.tal@cibc.com

Andrew Grantham
andrew.grantham@cibc.com

Katherine Judge
katherine.judge@cibc.com

CIBC Capital Markets
PO Box 500
161 Bay Street, Brookfield Place
Toronto, Canada, M5J 2S8
[Bloomberg @ CIBC](#)

economics.cibccm.com

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