AGRICULTURAL FINANCE

Protein Consumption Market Analysis

October 6, 2020

Introduction

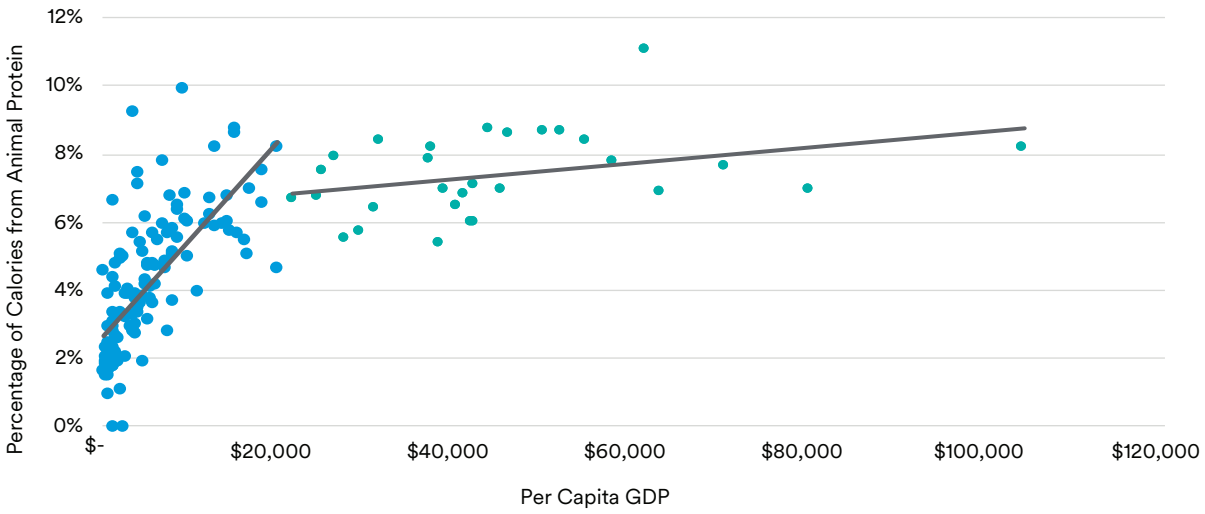
Despite increased appetites for alternative proteins, we expect global demand for beef, pork, and poultry to grow in the long term. Greater protein demand from emerging markets has boosted global exports in recent decades. The COVID-19 induced global recession may cause protein demand to moderate in the near term as incomes and protein consumption are linked.[1] However, we anticipate the long-term trend in protein consumption will likely continue its upward trajectory. Protein demand also continues to grow within developed economies but faces competition from alternative products such as plant-based protein. This trend both creates opportunities for differentiation among products, but also supply chain challenges in the sector. Regardless, we believe U.S. producers remain well positioned to help supply global protein demand.

MetLife Investment Management

Emerging Markets Spurring Conventional Meat Demand

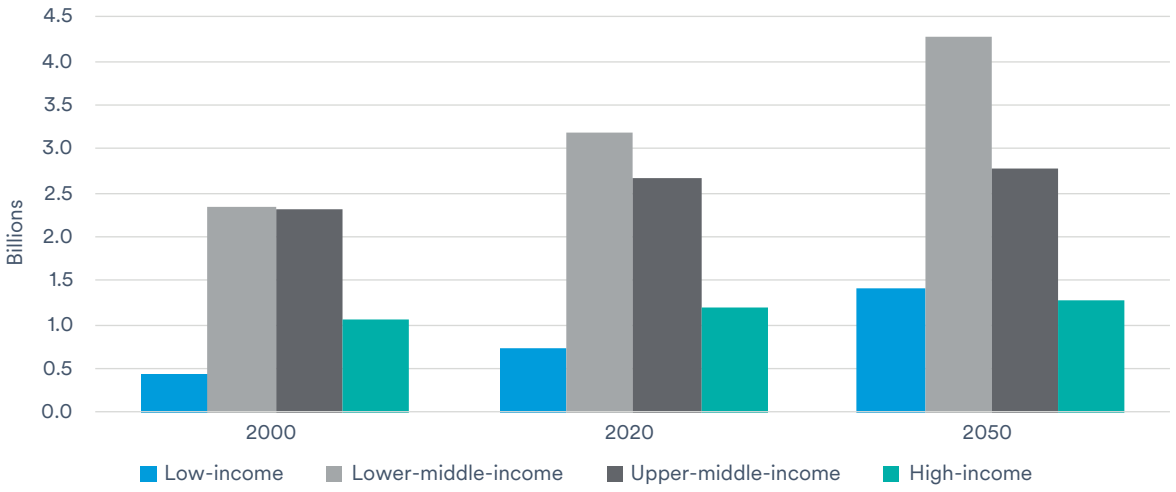
Rising incomes spur consumers to be more selective about their food choices. Historically, increases in per capita wealth have led directly to greater consumption of livestock products, primarily meat.[2] This is especially true among the lowest income earning consumers. Consumption of animal protein grows rapidly as consumer incomes increase in the lowest per capita GDP countries (Figure 1). The growth in proportion of calories derived from animal protein slows though once consumers achieve higher income levels. Important for global livestock producers, population is projected to expand the fastest over the next three decades within the lower-middle income countries (Figure 2). COVID-19 may cause income growth to decelerate globally in the near term.[3] However, long-term economic projections remain positive,[4] which is favorable for global protein demand.

Figure 1 | Protein Consumption versus Incomes (2016 values, 156 countries)



Sources: MIM, Food and Agriculture Organization of the United Nations

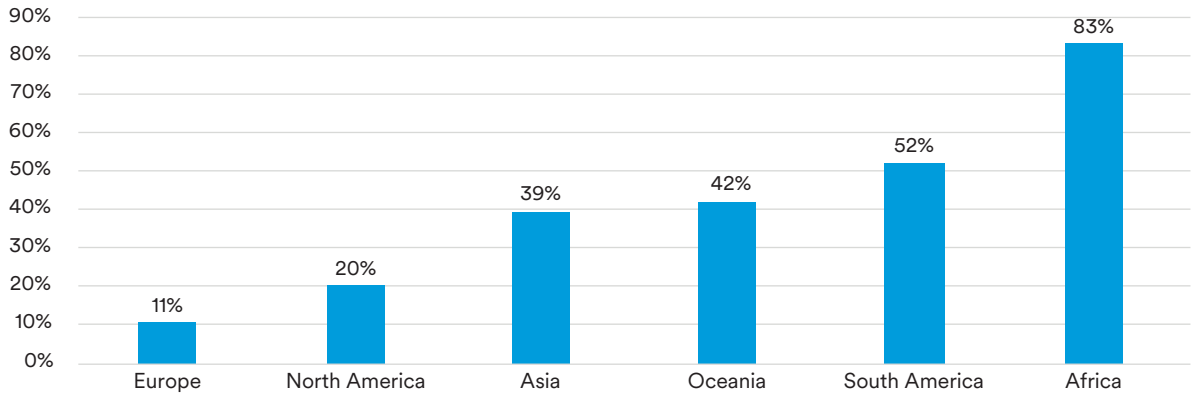
Figure 2 | Global Population by Income Level



Sources: MIM, United Nations

U.S. livestock producers will likely benefit from increased protein consumption as the global middle-class continues to expand. Furthermore, we expect increased animal protein consumption within emerging markets will more than offset stabilizing demand in more developed countries. On an aggregate basis, Africa and South America experienced the largest increase in total meat consumption between 2000 and 2020 (Figure 3). In per capita terms, over that period, meat consumption increased 21% in Latin America, 12% in Asia, and 11% in Africa compared to just 4% in the European Union and 2% in North America.[5]

Figure 3 | Total Meat Consumption Growth: 2000-2020



Sources: USDA Foreign Agricultural Service, MIM

China has been a major driver of the rise in global meat consumption, accounting for 34% of global growth due largely to its rising demand for pork.[6] Even possessing the largest hog herd in the world, China relies on imports to supplement its domestic production. On average, China imported 1.2 million metric tons annually between 2010 and 2019 from countries like the U.S., Brazil, and the European Union.[7] We expect this trend of rising demand for livestock protein will continue over the next decade as per capita incomes increase across Southeast Asia, Africa, and Latin America.

Evolving Protein Demand of Developed Nations

Meat consumption is evolving differently in more developed nations relative to emerging markets. In the United States and Europe, consumers are increasingly concerned with where their food comes from and the way it was produced.[8] Consequently, consumers have shifted their consumption towards specialty livestock products with higher welfare standards or plant-based substitutes of those protein sources.[9]

Expanding interest in socially responsible produced food has opened a value proposition for producers to pursue organic and other animal welfare-standard goods. In the U.S. today, approximately 59% of consumers routinely seek out food labeled as organic or natural, which includes grass-fed beef and free-range poultry.[10] In the U.S., organic food sales account for 4% of all U.S. food sales, dwarfing the percentage in many developing countries.[11]

The divergence in demand for organic food is largely attributable to the premium prices that organic foods, including meat, command. U.S. retail prices for organic meat often exceed their conventionally produced counterparts by over 50% for beef and pork, and over 150% for chicken (Figure 4). While premium prices can offer producers attractive returns, they may also limit future growth potential. Sales data supports this as organic food consumption is highest among households with incomes over $100,000.[12]

Figure 4 | Retail Meat Prices: Organic over Conventional Premiums Paid, 2017-2019

New York Strip	Bacon	Whole Broiler Chickens
$2.90 $/lb premium	$2.91 $/lb premium	$1.93 $/lb premium
87% % premium	60% % premium	178% % premium
Ground Beef	**Boneless Pork Chops**	**Boneless Chicken Breasts**
$5.26 $/lb premium	$2.31 $/lb premium	$4.44 $/lb premium
63% % premium	76% % premium	168% % premium

Sources: Agricultural Marketing Service Weekly Retail Organic Price Comparison, MIM

Another response to the demand for meat alternatives has been the development of plant-based meat. While vegetable burgers have existed for decades, the food industry recently pushed to produce imitation meat products that look and taste like their conventional counterparts.[13] The availability of these products has increased drastically in recent years, offering consumers an attractive high protein alternative to actual meat. However, like organic meat, these products also currently command premium prices. Plant-based meat that is intended to replicate ground beef often exceeds $7.00 per pound, or approximately twice the average retail price of actual ground beef.[14]

While still small compared to the overall market, demand for plant-based protein is experiencing strong growth. In 2018, global expenditures on plant-based meat totaled $10 billion.[15] This pales in comparison to the overall market for conventional meat which was approximately $946 billion.[16] However, plant-based meat expenditures are projected to rise 15% annually to $31 billion globally by 2026.[17] Furthermore, many consumers turned to plant-based protein products during COVID-19 due to retail meat shortages.[18] It is unclear whether these new customers will continue to purchase plant-based products or whether the sales growth will continue. However, plant-based products could eventually represent a minor headwind for livestock producers.

Impacts of Changing Protein Preferences on Production Agriculture

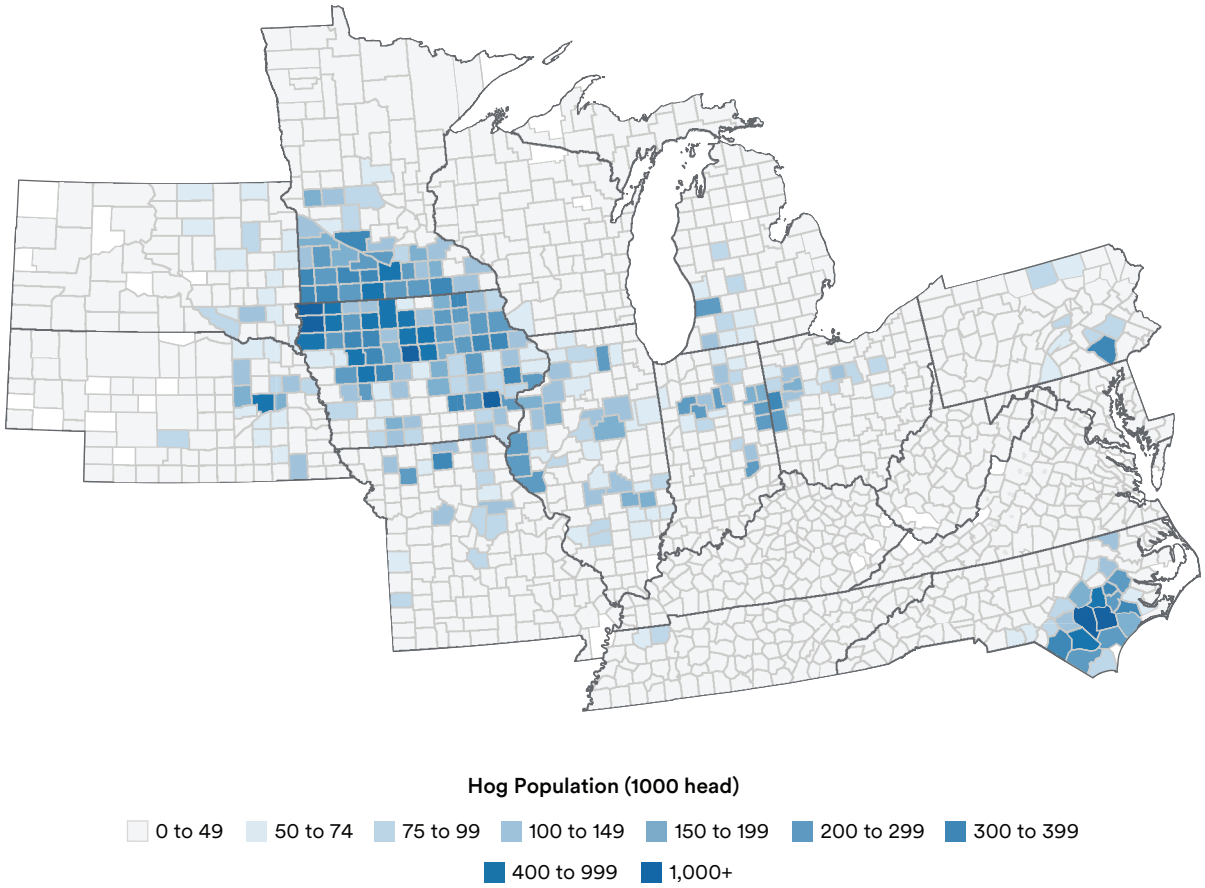
We expect the benefit of increased meat exports for U.S. agricultural producers will outweigh the impact from shifting consumption patterns. Until the cost of specialty livestock products and plant-based options rival or are lower than conventional meat, we anticipate these products will appeal mainly to individuals with the ability to pay for them. Progress has been made towards production reaching economies of scale, but in the near term, markets for these products will likely remain concentrated in highly developed countries. Conversely, growth for conventional meat demand is expected to increase across the globe and this may have implications for a variety of U.S. agricultural producers.

Increased global demand for meat will likely result in an expansion of the U.S. livestock sector and cause a simultaneous increase in feed demand. The U.S. livestock sector is a significant demand source for U.S. annual crops.[19] Therefore, as the livestock sector in the U.S. expands to meet global demand, U.S. annual crop producers should indirectly benefit by helping supply feed.

As an example, we expect annual consumption of pork globally will increase 49% over the next decade as the emerging middle class continues to grow.[20] Assuming the U.S. continues to supply a relatively constant proportion of global pork exports, the increase in export demand alone would require the U.S. hog herd increase by approximately seven million.[21] An increase in hogs of this magnitude would require approximately 750,000 additional acres of feed.[22]

Geography may determine the eventual impact on producers of increased consumption of meat abroad and plant-based meat domestically. Livestock production today is often concentrated within close proximity to the Corn Belt (Figure 5), and we expect this to continue moving forward. However, greater export volumes could lead pork production to expand faster in the western and southern Corn Belt, given relative proximity to large seaports in the West and the Gulf Coast. Conversely, for annual crop growers, the rise of plant-based meats may offer producers in non-core production regions more profitable growing options. This includes canola, peas, and other pulse crops ingredients of plant-based meats that could experience a surge in demand.

Figure 5 | Hog Population



Sources: MIM, 2017 USDA Agricultural Census

Endnotes

1 Share of Calories from Animal Protein versus GDP per Capita. World Bank. 2013.
2 Share of Calories from Animal Protein versus GDP per Capita. World Bank. 2013.
3 The Global Economic Outlook During the COVID-19 Pandemic: A Changed World. June 8, 2020.
4 The Global Economic Outlook During the COVID-19 Pandemic: A Changed World. June 8, 2020.
5 Domestic meat consumption for each region. United States Department of Agriculture via Haver Analytics. Accessed August 5, 2020.
6 China domestic meat consumption. United States Department of Agriculture via Haver Analytics. Accessed August 4, 2020.
7 Chinese pork imports. United States Department of Agriculture via Haver Analytics. Accessed August 2020.
8 Food Consumption Trends and Drivers. Kearney, John. September, 27, 2010.
9 Plant Based Food Market Worth $74.2 Billion by 2027. Business Insider. July 16, 2020.
10 Pastured Poultry Profile. Agricultural Marketing Resource Center. December 2018.
11 Organic Market Overview. USDA Economic Research Service. October 9, 2019.
12 Organic Produce: Who's Eating It?. USDA Economic Research Service. July 2008.
13 Plant-Based Meat, Eggs, and Dairy: 2019 State of the Industry Report. The Good Food Institute. Accessed August 2020.
14 Impossible Foods Joins Beyond On The Shelves Of Walmart, America's No. 1 Meat Seller. Forbes. July 30, 2020.
15 Plant-Based Meat, Eggs, and Dairy: 2019 State of the Industry Report. The Good Food Institute. Accessed August 2020.
16 Global Meat Industry Value. Statista. Accessed August 2020.
17 Plant-based Meat Market To Reach USD 30.92 Billion By 2026. Reports and Data. October 14, 2019.
18 How is coronavirus impacting plant-based meat?. Food Navigator USA. April 6, 2020.
19 Feedgrains Sector at a Glance. USDA Economic Research Service. February 26, 2020.
20 MIM internal calculation. Uses USDA data on global pork consumption and for key pork consuming countries. Global GDP projections from The World Bank are also used.
21 MIM internal calculation. Uses U.S. pork historical pork export volumes as a percent of global pork exports. Number of pigs reflects long-term increase in average slaughter weights.
22 MIM internal calculation. Calculation focuses on corn and soybean feed components. Acres are adjusted to reflect long-term trend of increasing yields per acre as reported by USDA NASS.

Authors

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Michael Gunderson is Director, Head of Agricultural Research & Strategy. He provides leadership to market analysis of annual and permanent agricultural crops, forest and timberland products, and agribusinesses to help drive investment strategy for MetLife Investment Management. In this role, Mike shares market insights regarding agricultural credit conditions, commodity price forecasts, and industry dynamics to support MIM's agricultural portfolio. Mike earned his Ph.D. in Agricultural Economics from Purdue University, an M.S. in Agricultural Economics from Cornell University, and a B.S. in Agribusiness, Farm, and Financial Management from the University of Illinois.

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