2023 REPORTS

Rebuilding the Beef Supply Chain After the Drought

FEEDING THE APPETITE FOR HIGH QUALITY

By Dave Weaber

SITUATION

Through the COVID experience, many U.S. consumers gained new cooking skills and discovered the joy of eating restaurant-quality steaks at home. As a result, many shoppers have shifted their purchasing patterns to include more branded, upper-2/3 choice and prime-graded products.

OUTLOOK

Near-term inflationary pressures have reduced real consumer spending, but as consumers readjust, demand should recover, even as tightening cattle and beef supplies and continued strong exports will likely press beef prices higher.

IMPACT

As the entire beef supply chain adjusts to higher prices and expands packing capacity, U.S. beef producers can find opportunities to deliver and get paid for higher quality eating experiences.

Strengthening consumer preference for high-quality prime, branded and upper-2/3 choice beef has created opportunities for cattle producers to consider before they rebuild their drought-reduced cattle inventories.

The beef market is clamoring for additional volume of the highest quality grades. That demand is expressed in the quality spreads: cutout value price spreads between prime and choice grade, as well as branded, upper-2/3 choice and choice grades, have widened.

However, the upside potential for fed cattle prices has faced its limits. Beef plant slaughter capacity has been running at near-operational limits for several months, so beef packers haven't been able to ramp up head count to fill the shortfall of quality product.

The feeding sector feels price pressures on the supply side, too. Drought conditions and resulting herd reductions will be limiting feeder cattle and calf supplies, likely rallying prices for feeder cattle and calves. Additional impacts from high feed, energy, transportation and labor costs are creating further headwinds for the feeding sector's margins.

The changing landscape of the beef market and supply chain will necessitate careful considerations by cow-calf producers as to the genetics they use when they are able to restock their drought-stricken ranches. There is a unique opportunity that rebuilding creates and producers may want to consider being part of a marketing system that aligns efforts among seedstock producers, cow-calf, stocker and feeding operations with a slaughter facility and retail outlet. These coordinated systems will be uniquely positioned to deliver high-quality, feed-efficient, traceable cattle and beef with marketing that consumers can embrace. Being part of the system will likely be the only way for cattle producers to share in the additional value and dollars that such a system can create.

BEEF PRICES FIND A NEW, HIGHER NORMAL

Choice boxed beef cutout values and, to a lesser degree, fed cattle prices have traded in a narrow range during 2022 even as fed cattle supplies have remained ample and retail pricing remained at near record levels. Beef packing plants have endeavored for months now to keep daily fed cattle slaughter at or very near 100,000 head per day, which appears to be the new operational limit.
The USDA 5-area average steer prices during 2022 have been about 18% above 2021 levels on a year-to-date basis.

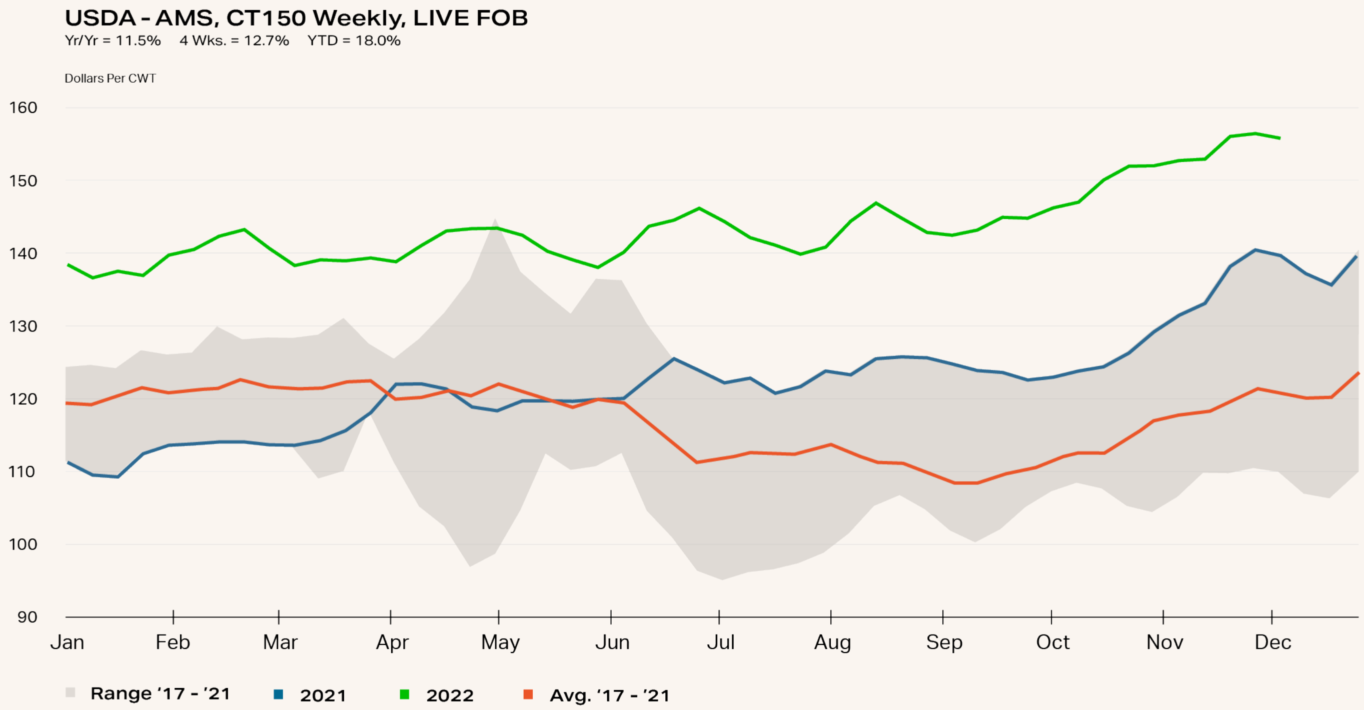
Prices have ranged from an annual low of $136.61 per hundredweight (cwt) during the second week of January to the annual high of nearly $156.42/cwt during the first week of December. This would certainly place 2022 in the category of years with a contra-seasonal price pattern.

Normal years typically have prices peaking in late March thru April as seasonal beef demand improves with grilling season and fed cattle prices setting seasonal lows in the late summer (late-August thru early September).

SIDE NOTE:

The USDA 5-area reports include sales data for cattle traded in Texas/New Mexico/Oklahoma, Kansas, Colorado, Nebraska, and Iowa/Minnesota. The 5-area states account for about 85% of the U.S. cattle on feed inventory.

5-Area Weekly Weighted Average



Changes in cooking habits and the cuts that consumers desire also change with the weather and typically drive some of the seasonal patterns in the choice and select cutout values and the spread between them. During grilling season from late March thru Independence Day, consumers typically focus on purchasing steak items from the rib, loin and sirloin primals, the so-called middle meats. A secondary smaller surge in demand for these items occurs for the Labor Day holiday.

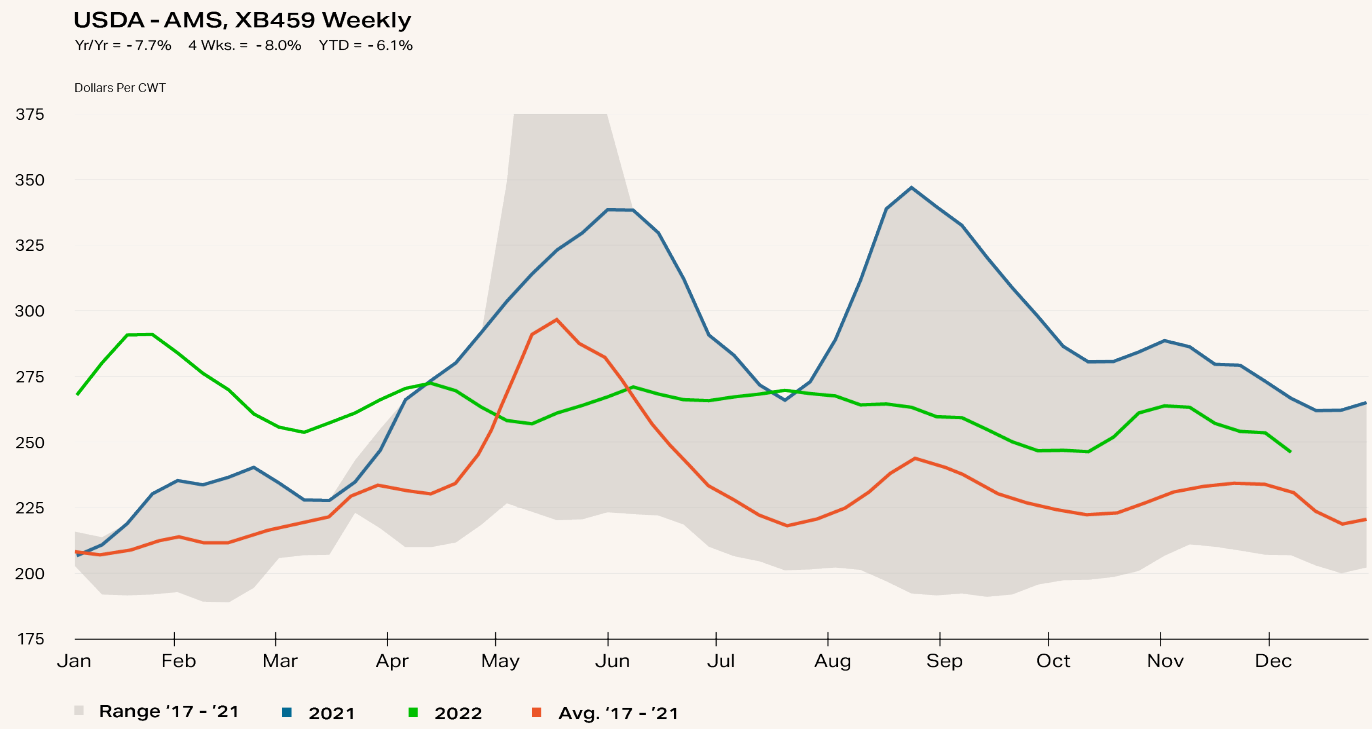
Due to the high relative values of these cuts and respective contribution to overall carcass value versus roast cuts and trimmings for ground beef, any shift in seasonal demand for middle meats generates greater swings in carcass cutout values.

Likewise, any consumer preference difference among the quality grades or branded programs widens the price spread between them. Historically speaking, boxed beef cutout values peak in mid-May and have smaller peaks ahead of Labor Day. The rally in cutout values in late November are limited since support is limited to the rib and chuck primals, while loin, round, thin meats and trimmings prices are mostly flat or trending lower.

This year's price pattern for the cutout values has played out differently as the markets during the beginning of the year were still under the influence of robust consumer sentiment and spending. Consumers came out of COVID lockdowns and restrictions with rediscovered or newly found cooking skills that supported sales volumes and prices at retail. Relieved to be able to get back to a more "normal" pre-COVID situation many people got back to participating in more social settings, traveling for leisure, and enjoying restaurant meals, which all further supported demand. As a result, the highest prices, during 2022, for both choice and select cutout values occurred in late January.

Choice boxed beef prices peaked at nearly $291/cwt and select boxed beef cutout peaked at $282.07/cwt.

Choice Boxed Beef Cutout Value



Both cutout values retested late winter lows in early-March and then began to flounder as inflationary pressures and sharply higher energy and fuel prices began to take their toll on consumer budgets.

The following nearly two quarters were marked by contra-seasonal price movements until late August when markets began to settle into a more traditional pattern for the rib, loin, chuck, brisket, flank, and short plate primals. Round prices have remained in a very narrow, but slightly rallying trading range since the beginning of May. Chuck and round primal values have certainly been supported by solid demand and well underpinned prices for more "upscale" ground chuck and ground round specifications.

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EXPORTS TO ASIAN COUNTRIES ADD SUPPORT TO DOMESTIC PRICES

Simultaneously, the rest of the world in total purchased more U.S. beef. January thru October 2022 year-to-date U.S. beef exports were up 4.6%, totaling slightly less than 3.0 billion pounds on a carcass weight equivalent (CWE) basis. Trade to the longstanding key Asian markets of Japan and South Korea were down 1.4% and up 1.9%, respectively, for the year. This is not a terribly bad performance given the rally in the strength of the U.S. dollar. But the real export growth driver has been China's buying which was up 25.8% through October 2022 versus a year earlier.

The U.S. dollar index rallied about 15.5% from March to October as investors around the world have rushed to move their capital to higher quality investments that they can find in the U.S. economy. The U.S. dollar's performance versus some importing country's currencies has been a significant headwind since the beginning of March 2022. The Japanese yen has weakened nearly 25% versus the U.S. dollar since then, while the South Korean Won has lost 15.7% of its value.

During 2021, beef exports to Japan were down 2.7%. In sharp contrast, 2021 U.S. beef exports to South Korea were record large at 785 million pounds CWE and up 17.9% versus a year earlier.

Despite two years of slowly declining shipments to Japan and a rapid growth in exports to South Korea, Japan remains the largest market for U.S. beef exports. The Japanese lead is fragile with China becoming a major purchaser of beef from nearly all exporting countries. In fact, the growth in China's purchasing has made it harder for more traditional markets to source U.S. product.

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China first discovered African Swine Fever in their domestic swine herd in 2018. This led to massive death losses due to the infection or government efforts to contain the spread of the disease. Chinese demand for animal-sourced protein has been the major net real growth driver for U.S. beef exports during 2021 and the first three-quarters of 2022. Year-to-date thru October, U.S. beef exports to China are running at a record pace and are up 25.8% versus last year. This has put China in a solid position to be the third largest trading partner for U.S. beef for the year. Last year beef exports to China grew at 837% versus a year earlier.

Prior to 2018, China had never purchased more than 19 million pounds CWE of U.S. beef in a single year. During 2018, China purchased a record 22 million pounds CWE of U.S. beef, which was a new record-setting total and 234% of the previous year's total. During 2021, the U.S. exported a record 541 million pounds CWE to China. This was a 25-fold increase in three short years.

By volume, exports to Asian countries typically account for 70% to 75% of U.S. beef shipments. This relationship has surged higher from pre-COVID levels when Asian countries typically accounted for 62% to 67% of total volume, which at the time represented a return to levels since before the discovery of Bovine Spongiform Encephalopathy (BSE) in the U.S. cow herd in late 2003.

POTENTIAL FOR GLOBAL RECESSION AND HEADWINDS FOR BEEF DEMAND

The trend toward a global recession poses significant risk for U.S. beef and cattle. The rallying dollar makes U.S. beef products relatively more expensive as foreign consumers' buying power is threatened by their own country's economic woes.

Of the current markets for U.S. beef, China may be the least at risk due to their currency being pegged to the U.S. dollar, but that doesn't negate risks stemming from their internal struggles. A partial list of issues includes a significant slowing in their manufacturing sector, looming financial issues in housing construction, a slowing of shipping, and recent embargoes impacting electronic chip manufacturing.

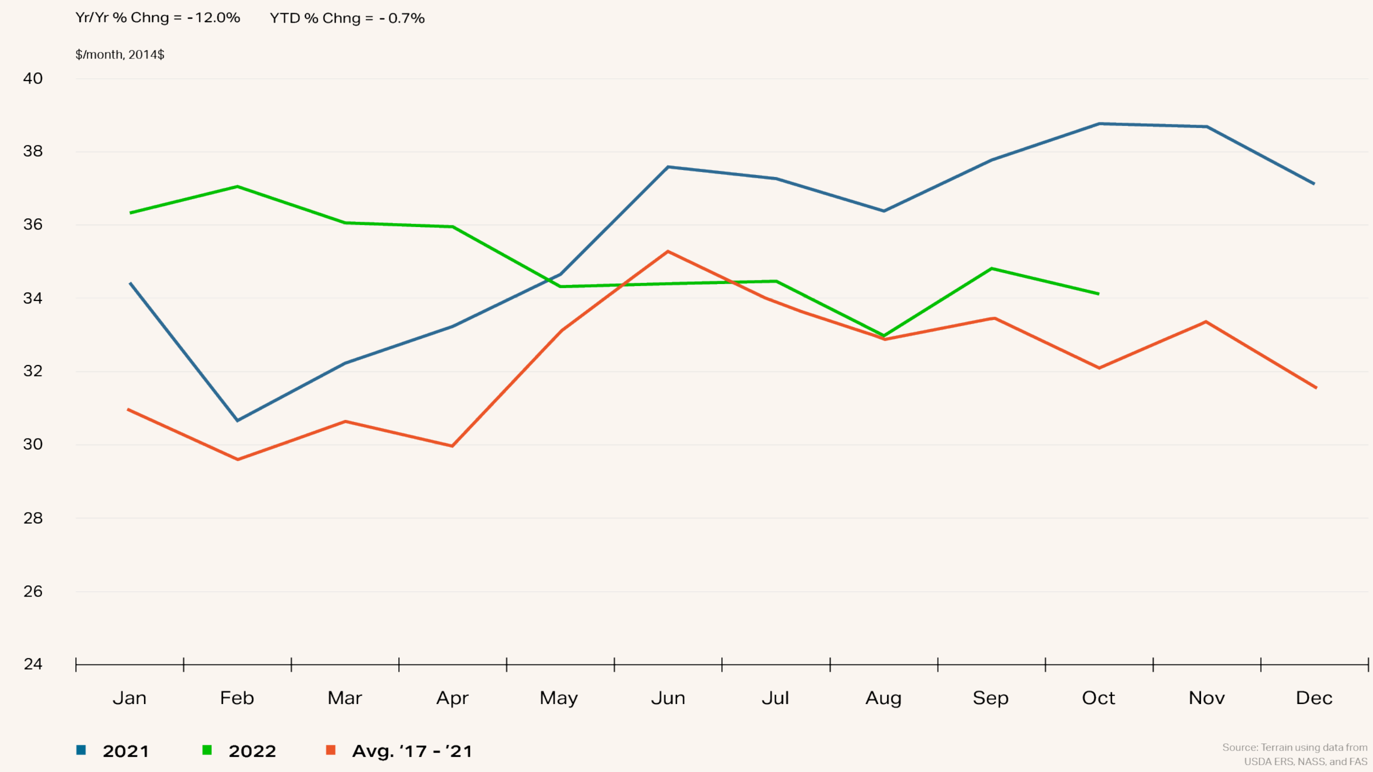
The Chinese government is faced with addressing all these complicated issues while trying to maintain their Zero-COVID policy by continuing to lockdown populations across the country.

Risks to beef demand are not just associated with U.S. beef export markets and destinations. Economic recessionary trends are already in place in the United States as gross domestic product has declined versus a year ago for the past two quarters. Inflationary trends are forcing consumers to make hard choices. Higher prices for core items plus rapidly increasing food and energy costs are headwinds to beef demand growth.

So far this decline in our calculated demand index has been driven by two of the three key factors. First, the rapidly rising Consumer Price Index (CPI) by the U.S. Bureau of Labor Statistics describes the eroded value of the dollar, essentially any given price per pound buys less beef.

USDA's Choice retail beef price is the best consumer level gauge of price for beef, and it set new all-time record monthly highs from July 2021 thru July 2022. By this measure retail beef price has been relatively flat for all of 2022 at an average price of $7.63/lb.

Real Per Capita Expenditures - Choice Beef



This high price was solidly above prices a year ago from January thru May, and then the year-over-year gap began to narrow. Simultaneously, the CPI year-over-year increase had exceeded 2% in April 2021.

By January 2022, the CPI growth rate had accelerated to about 7.5% and has averaged 8.3% year-over-year growth on a year-to-date basis.

Year-to-date, thru October, choice retail beef prices averaged 6.7% above a year ago while retail pork prices were up 10.1% and retail chicken prices were up 16.6%. Both retail pork and chicken prices, as reported by USDA, have set new, record-high monthly prices. From a competitive standpoint, beef appeared to have a winning hand with consumers, as nominal beef prices were stable to slightly declining while competing meat prices were rising quickly. During a low-inflation period, this would have been true. But in the high inflation environment, real (deflated) expenditures and net beef demand didn't keep pace.

> *Even though nominal retail beef prices, as reported by USDA, look relatively flat; on a real deflated basis they were declining (i.e. not keeping pace with monetary inflation).*

EXPORTS TO ASIAN COUNTRIES ADD SUPPORT TO DOMESTIC PRICES

While all the risks continued to prowl around beef demand, the supply side was also threatening prices and spreads as monthly per capita supplies began to shrink versus year-ago levels during May. Federally inspected beef production has been 1.5% larger in 2022 year-to-date than a year earlier, but the growth in exports has exceeded the growth in imports and the population continues to grow, so net disappearance has shrunk on average at about 0.5% each month versus a year ago from May thru October 2022.

May 2022 is when things for the beef supply chain came to a crossroads, especially in terms of real per capita expenditures and beef demand. U.S. consumers had stiff competition for the slightly larger U.S. beef production. Net exports resulted in smaller net beef supplies. Add to this, nominal consumer level prices were mostly flat while inflation eroded the real value of those prices.

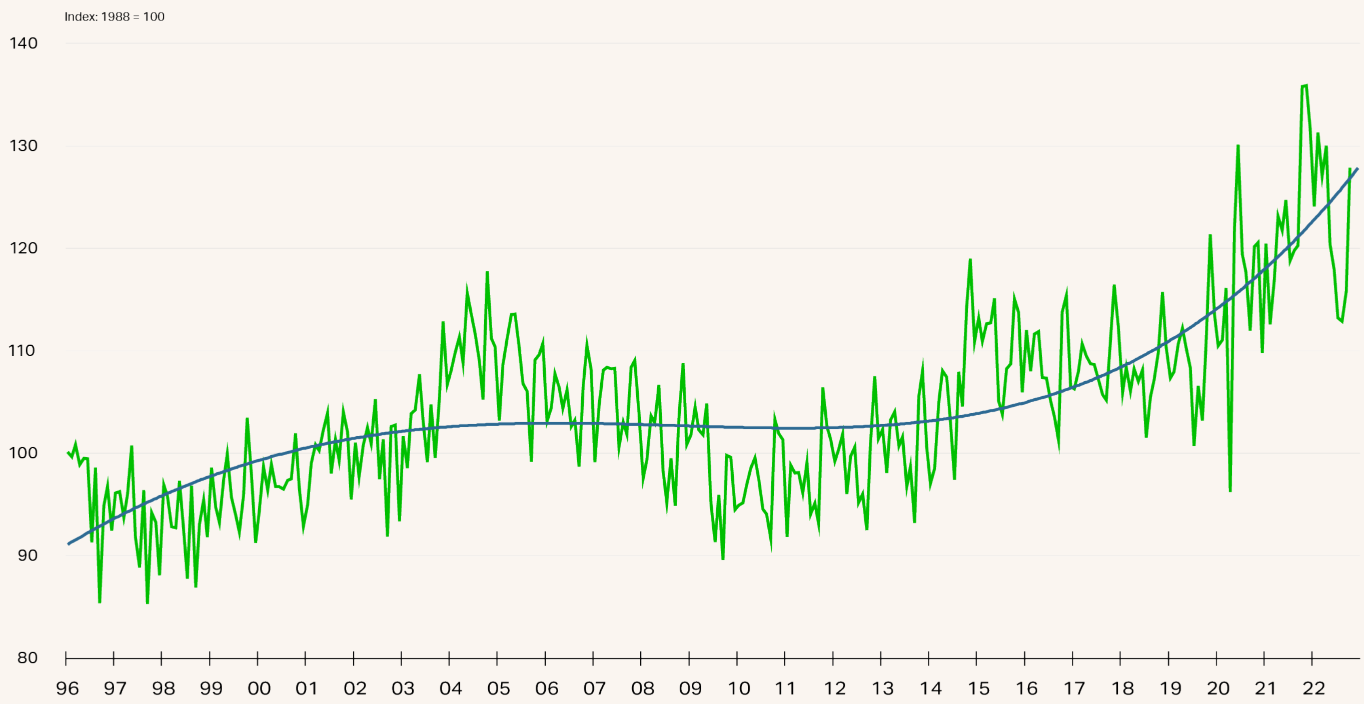
Prior to 2020, Real per capita choice beef expenditures had only exceeded $33 per month about ten times (3.3%) in the data series starting in 1995. Since the COVID era started in March of 2020 through October 2022, real per capita beef expenditures have been above $33 per month about 72% of the time (23 out of 32 months).

SIDE NOTE:

Net disappearance is domestic production minus exports plus imports and plus/minus changes in cold storage stocks. In this example, the total represents the net total pounds of beef available to consumers regardless of purchase or consumption channel.

If the industry can maintain these levels of consumer spending near term and right the ship in terms of demand volume during the next six to twelve months, the system may then be able to go through a period of cattle price readjustments to the higher side, pushing margins that exist today in the beef side of the business (retail/foodservice and to a lesser degree packers) toward the cow-calf, stocker and feeding sectors of the business.

Choice Beef Demand Index



Source: Terrain using data from USDA ERS, NASS, and FAS

This shift could potentially provide the needed capital and incentive to rebuild cow herds that have felt the impacts of drought and profitability.

STAY-AT-HOME EATING DROVE CONSUMERS TO CRAVE QUALITY

In addition to these changes, there are likely opportunities amidst the potential generational change of ownership and the investments going on in the feeding and packing segments.

Capital is being allocated to substantially grow and make the feeding sector more efficient and there is investment of two new packing plants that are fully vertically aligned between cattle producers and retailers. Alignment runs the gamut from genetics and animal health to sustainability, quality, traceability and efficiency.

My analysis certainly illuminates some of the progress the beef supply chain has made in terms of delivering value to consumers and has charted a path to continue to find ways to grow demand. One of the clear lessons in that progress is the industry must continue to deliver high-quality, tender products that deliver a great eating experience. To that end the COVID era has some distinct points to consider that are likely to impact the future.

First among these is that consumers were forced to reinvest in their skills in the kitchen. While the pellet smoker revolution (the man's crockpot) had already changed household kitchen responsibilities, the first 12 months of COVID changed the way consumers viewed and approached eating at home and eating away from home.

For some, eating at home was still eating restaurant-prepared meals either through take-out or delivery by one of the new food-delivery options. For others, eating at home became an exercise (maybe an experiment) in trying to replicate a restaurant eating experience.

For the households exercising and perfecting their own food preparation, beef had the opportunity to shine. For some consumers it was dressing up or upgrading the ground beef they chose to buy.

For others, they made use of the many roasting items available in the meat case that they had previously not purchased due to how long it took to prepare them. Certainly, many an InstantPot™ was retrieved from some household cabinet, pantry or storage closet, dusted off and enlisted into sometimes daily use only to be relieved of service by an air-fryer on occasion.

At the time these methods were being mastered, the meat case had recovered from being decimated in the early COVID run on grocery stores.

What consumers found in the meat case, especially in club stores and the butcher shop or specialty grocer they had forgotten about, was an expanded offering of upper-two-thirds choice-graded product, including the likes of Certified Angus Beef or its many branded , or prime-graded middle meats, such as bone-in and boneless ribeye, New York strip, Kansas City strip, Porterhouse, T-bone and sirloin steaks).

These cuts were a large majority of the cuts that restaurants had served and couldn't do so due to the lockdowns and slow recovery from them.

One of the clear lessons in that progress is the industry must continue to deliver high-quality, tender products that deliver a great eating experience.

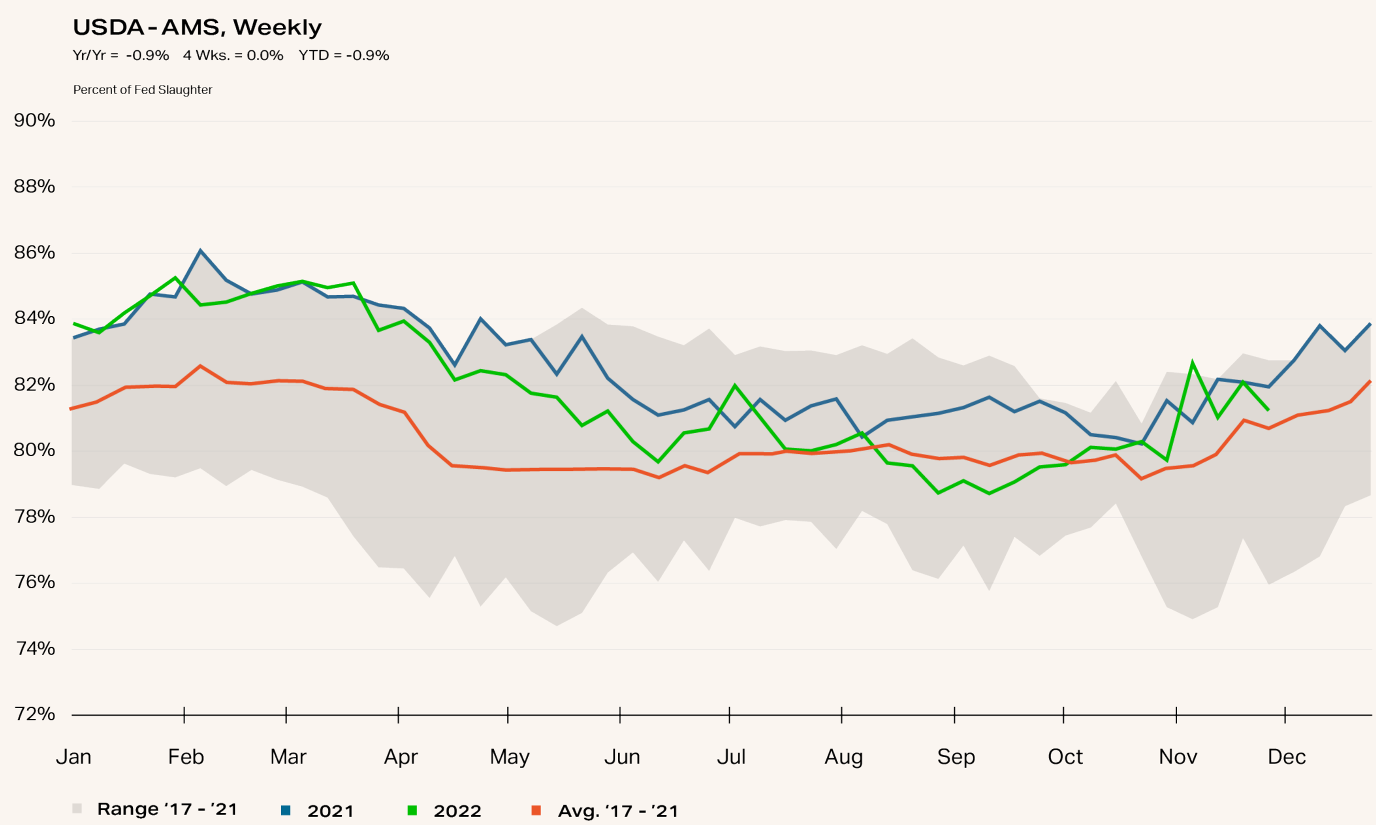
Additional upper-2/3 choice and prime graded product was available due to nearly a million head of backlogged cattle in the feeding system. That meant extra weeks of time on feed for cattle if a feedlot owner was lucky and more than likely an extra month or more of time on feed adding to losses. This extra time on feed helped show the system what feeding to a maximum grade potential could look like both from a product grading standpoint and how potentially bad incremental cost of gain can get.
The slowdown in cattle movement in the early part of the COVID related plant shutdowns and the reduced plant capacity that followed forced the feeding system to increase two of the major factors affecting quality grade obtained by cattle. These two were the physiological age of cattle and the number of days the cattle spend consuming a high concentrate and high energy diet. Both added to the mix.

The other factor affecting grading potential in cattle is genetically driven. Cattle with a high percentage of Angus or other proven, highly marbled lines in other breeds will outperform other cattle. The last major drought that occurred from mid-2011 thru mid-2013, or more accurately the decisions by ranchers and cow-calf producers to rebuild herds in 2015 thru 2019 with females from higher quality grading potential seedstock herds or to restock their herd bull battery with higher quality grading lines from Angus or composite lines of cattle made up the rest of the difference.

From mid-summer thru late-fall, the beef industry saw a 3% to 4% decline in the choice and prime grading percentage. The root cause of the decline is potentially due to several factors including a heat stress event in southwest Kansas, drought impacts on cattle before they arrived at the feed yard, etc.

More importantly for this discussion is the about 2% decline in prime grading carcasses versus a year ago and the nearly 3% decline compared to the peak that occurred earlier this

National Steer/Heifer Choice and Prime Grading



National Steer/Heifer Choice and Prime Grading

year during the week ending March 26, 2002, when there were nearly 11% prime graded cattle in the fed slaughter mix. Cattle have graded a higher percentage prime in recent times, but they were during 2020 and the spring of 2021 when the plant backlogs and resulting backlog of fed and feeder cattle were in the system.

In spring 2022 when the prime grading percentage peaked and the supply of prime-graded beef went up, the spread between the prime boxed beef cutout and the choice cutout value narrowed to $26/cwt or $172.90/head or $518 for every 100 carcasses sold. This new floor isn't that far from the old seasonal highs and may suggest that beef demand has seen some of its significant growth in the premium end of the business despite overall beef demand being under pressure in the current economy.

Similar but smaller results can be seen in the branded and upper-2/3 to-choice spread data. The branded and upper-2/3 choice market segment is much more mature, saturated and competitive.

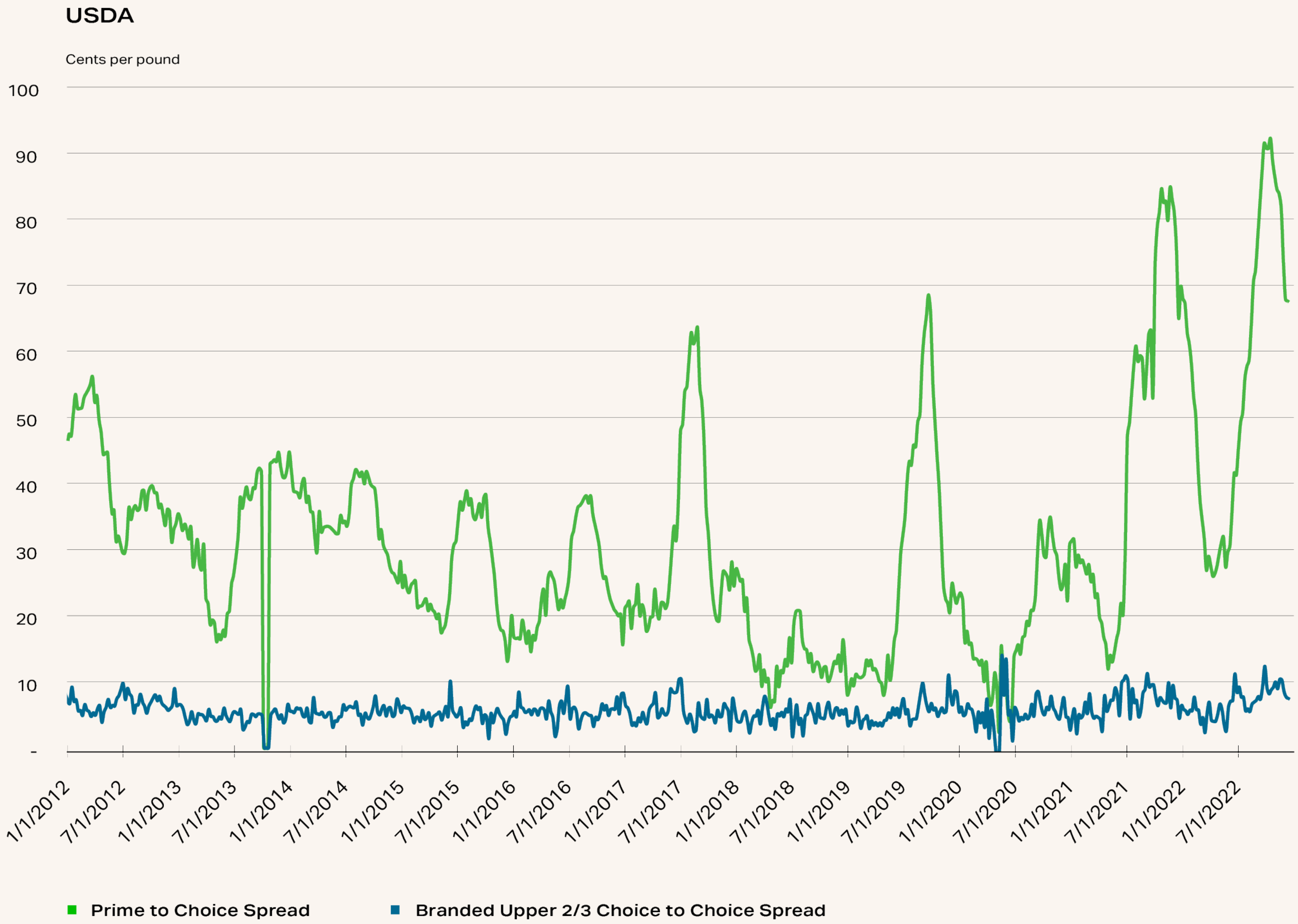
Industry participants are reacting to the trend of increased price spreads for upper-2/3 choice and prime carcasses. The focus on high-quality-grading cattle genetics combined with feeding efficiency and traceability is growing rapidly. Evidence for this can be found in the plans and marketing programs tied to newly constructed or newly proposed plants that will be built in the next several years.

What should really get the supply chain's attention is the explosive nature of the prime-to-choice price spread when prime product as percentage of the total gets a little bit short. The spread went from $26/cwt in late-March and early-April to $92/cwt or $612 per head during the second week of October 2022.

If feedlots could recover the 3% decline in prime grade that has occurred since the spring, they would add three prime-grading head to the mix for every 100 carcasses graded and would add $1,835 to the value of that 100 head.

While this increase in carcass values represents a best-case scenario for now at the packing level, cattle feeding companies and those

Comprehensive Boxed Beef Cutout Values



responsible for negotiating grids and formulas will take notice. During the next two or three years it will be paramount for feeders to press their advantage as they will have the greatest opportunity during tight cattle supplies to build this value into fed cattle pricing.

Cow-calf producers will have the opportunity to again impact overall herd quality as they rebuild numbers when the drought recovery begins. Continued focus on producing high-grading and high-cutability (best yield grade) carcasses while improving both maternal and feedlot feed efficiency will be paramount.

The number one tradeoff for feedlots to manage in the equation will be the balance between producing more prime-grading carcasses and producing more yield grades 4 and 5 carcasses. Discounts on yield grade 4 and 5 carcasses could exceed the prime premium. Generally speaking, in the current feeding environment, for every prime-grading carcass added to the mix, three or four yield grades 4 or 5 carcasses are added, too. High grain prices and respective high cost of gain make choosing and developing the right genetics the greatest opportunity or risk.

Terrain