

# Agriculture By the Numbers

March 2021

**NDSU Extension Agribusiness and Applied Economics**

U.S. and N.D. Beef Cow Herds Decline Cyclically

NDSU Extension Projects Commodity Prices for 2021

The Battle for Acres is Back

Texas Weather Leads to Decline in U.S. Ethanol Production

Economic Uncertainty Persists in 2021

## U.S. and N.D. Beef Cow Herds Decline Cyclically

By Tim Petry, NDSU Extension Livestock Economist

The U.S. Department of Agriculture’s National Agricultural Statistics Service released the annual “Cattle” inventory report on Jan. 29, 2021. It is available at <https://usda.library.cornell.edu/concern/publications/h702q636h>.

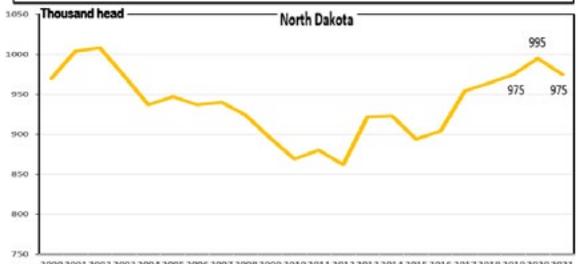
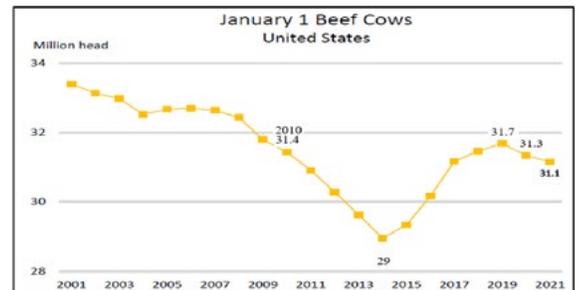
As expected, cyclical beef cow herd liquidation continued. Beef cow numbers peaked in 2018, with liquidation occurring during 2019 and 2020. U.S. beef cows on Jan. 1, 2021, at 31.16 million head, were down 181,000 from the 31.34 million on Jan. 1, 2020. That is a decline of 533,100 head in the past two years.

The decline followed 2014 through 2018 cyclical increases of 376,000; 833,000; 1,007,000; 276,000 and 245,000 head. That five-year increase in beef cows since the cyclical low recorded on Jan. 1, 2014, was 2.7 million head.

A number of factors likely led to the decline in beef cows during 2020. Drought is at the forefront, starting the year in the Four Corners and Pacific Northwest regions and expanding throughout the year into much of the western U.S.

Fewer beef replacement heifers entered the herd and beef cow slaughter was up 2.5%. Harsh winter weather conditions, particularly in some northern Plains states, some reports of more open cows

**USDA** United States Department of Agriculture  
National Agricultural Statistics Service



Editor: Bryon Parman  
Assistant Professor/Agricultural Finance Specialist

701-231-8248  
bryon.parm@ndsu.edu



North Dakota State University  
Fargo, North Dakota

Continued on page 2.

# U.S. and N.D. Beef Cow Herds Decline Cyclically

— continued from page 1

than normal and narrowing cow-calf margins likely contributed to the liquidation.

Declines in the beef cow herd centered in the very dry Intermountain West. Colorado lost the largest number of cows at 112,000 head. Neighboring states included Wyoming, which lost 22,000, New Mexico declined 17,000, Idaho dropped 16,000 and Utah was down 13,000.

Drought expanding into the northern Plains contributed to beef cow declines in Nebraska, North Dakota, Montana, Minnesota and Iowa.

North Dakota beef cow numbers declined 20,000 head from 995,000 on Jan. 1, 2020, to 975,000 in 2021, back to the same number as in 2019.

Other states with notable beef cow declines included Missouri, declining 48,000 head, Kentucky losing 38,000 and Virginia down 31,000.

But not all states showed contraction. Several southern Plains states expanded, with Texas increasing beef cows by 115,000 head, followed by Oklahoma increasing 80,000 and Kansas adding 34,000 head.

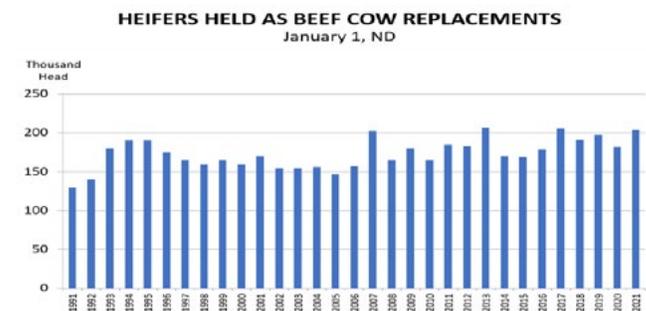
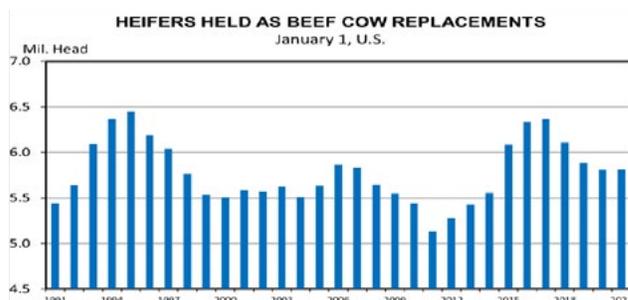
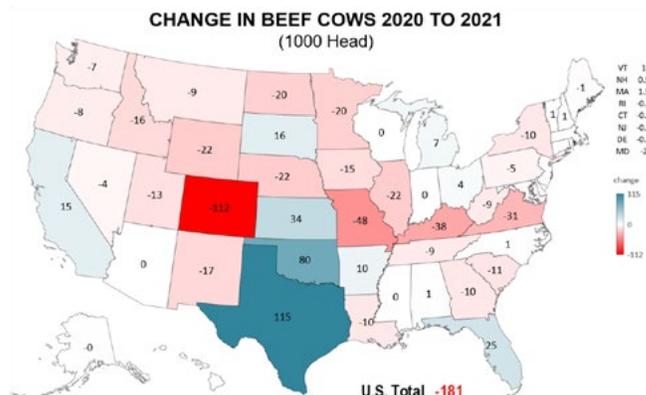
The U.S. beef replacement heifer inventory was unchanged from last year at 5.81 million head. The number of bred beef heifers expected to calve in 2021 was 3.55 million, up 1.3% from last year.

North Dakota beef replacement heifers increased 22,000 head, from 182,000 on Jan. 1, 2020, to 204,000 head in 2021. In the past several years, North Dakota producers have been developing more beef replacement heifers as a value-added enterprise.

The 204,000 head in 2021 is the fifth largest number of replacement heifers on record, with 2017 the fourth highest and 2013 in third place, only surpassed by numbers in the 1960s, when the U.S. beef herd still was expanding.

Lightweight heifers receive \$30/hundredweight or more in price discounts than steers but gain in price relative to steers as weights increase. And retaining heifers provides marketing flexibility. They can be marketed in the spring as feeder cattle or kept and bred in the summer, depending on weather and market conditions.

The 2020 U.S. calf crop (includes beef and dairy calves) declined 1.3% at 35.14 million head. The past two-year decline was almost 1.2 million head. A smaller calf crop is expected in 2021, which would be supportive to cattle prices.



The 2020 North Dakota calf crop declined 30,000 head, but on Jan. 1, 2021, the estimated North Dakota feeder cattle supply was up 58,000 head. Strong North Dakota calf sales are expected in the first few months of 2021.

Weather and summer pasture conditions are always the wild card affecting changes in beef cow numbers. Much of the western U.S. is experiencing drought conditions, with about half the beef cow herd currently in areas with drought. More than 90% of North Dakota has drought conditions reported.

So beef herd expansion in 2021 is not likely, and a relatively stable herd was expected even with normal moisture conditions. Significant spring and summer rainfall will be necessary in the drought-impacted western U.S., including North Dakota, to prevent further beef herd liquidation.

# NDSU Extension Projects Commodity Prices for 2021

By Ron Haugen, NDSU Extension Farm  
Management Specialist



eclipse\_images\_istockphoto.com

Planning for the future can be a very frustrating process, especially in times of market volatility.

Planning typically pays high dividends. For most farm and ranch managers, developing realistic commodity price expectations is one of the most difficult and complex tasks of the planning process.

To make the planning process easier, NDSU Extension has released its 2021 short- and long-term agricultural planning price projections for North Dakota.

The publication shows 2021 price projections for crops and livestock produced in the state and price estimates for future years. Price projections are given for the major crop commodities: wheat, durum, oats, feed barley, malting barley, oil sunflowers, nonoil sunflowers, corn, soybeans, canola, flaxseed, winter wheat, dry beans, dry peas, lentils, alfalfa hay and mixed hay.

Price projections for livestock and livestock products include beef steers and heifers at various weights, cull cows, slaughter steers, slaughter hogs, slaughter ewes, slaughter lambs, feeder lambs and milk. The publication also provides historical prices as a reference.

The estimated short-term planning prices should be used as a guide in setting price expectations for 2021 production. These planning prices can be used for preparing annual enterprise budgets and annual whole-farm cash flow projections. Cash flow projections are very critical with today's tight margins.

Short-term prices should not be used for planning capital purchases or expansion alternatives that would extend beyond the next production year.

The "Plotting a Course 2021" publication (EC1090) is available online at <http://bit.ly/PlottingACourse2021> or by contacting your NDSU Extension county office.

## 2021 Planning Price Projections

### Crop

Spring wheat	\$5.65/bu
Durum wheat	\$6.35/bu
Oats	\$2.60/bu
Feed barley	\$2.90/bu
Malting barley	\$5.00/bu
Oil sunflowers	\$20.00/cwt
Nonoil sunflowers	\$26.50/cwt
Corn	\$3.80/cwt
Soybeans	\$10.25/bu
Canola	\$19.00/cwt
Flaxseed	\$10.70/bu
Winter wheat	\$4.85/bu
Dry beans	\$30.00/cwt
Dry peas	\$10.83/cwt
Lentils	\$18.00/cwt
Alfalfa hay	\$90.00/ton
Mixed hay	\$68.00/ton

### Livestock and Milk

400-500 lb beef steers *F	\$185.00/cwt
500-600 lb beef steers *F	\$168.00/cwt
600-700 lb beef steers *F	\$158.00/cwt
700-800 lb beef steers **S	\$148.00/cwt
800-900 lb beef steers **S	\$143.00/cwt
1,100-1,700 lb cull cows	\$68.00/cwt
250 lb slaughter hogs	\$55.00/cwt
Slaughter ewes	\$70.00/cwt
105-140 lb slaughter lambs	\$160.00/cwt
60-90 lb feeder lambs	\$190.00/cwt
All milk	\$21.00/cwt

\* To estimated heifer prices, subtract \$15/cwt

\*\* To estimate heifer prices, subtract \$6/cwt

F Fourth quarter 2021 prices

S First quarter 2022 prices



# The Battle for Acres is Back

By Frayne Olson, NDSU Extension Crop Economist/Marketing Specialist

During the past several weeks, I have received an increasing number of questions about 2021 planting intentions for farm managers in North Dakota and nationally. Increasing corn and soybean prices are raising questions about the balance of planted acres needed between these two major crops in 2021.

U.S. soybean plantings were cut dramatically in 2019 and 2020 due to lower prices resulting from the U.S.-China trade war. However, the implementation of the Phase One trade agreement and very strong feed demand from China has dramatically expanded U.S. soybean and corn exports, cutting forecasts for ending stocks. Low ending stocks lead to increased prices, and price volatility, leading to increased acreage the following year.

The U.S. Department of Agriculture (USDA) recently held its annual Outlook Forum, where it released the first forecasts for 2021-22 supply and demand conditions for major crops, meat products and dairy. While these forecasts are based entirely upon mathematically forecasting models and do not include any survey-based information from farmers, they provide a common base for market analysts to debate expectations for the upcoming marketing year.

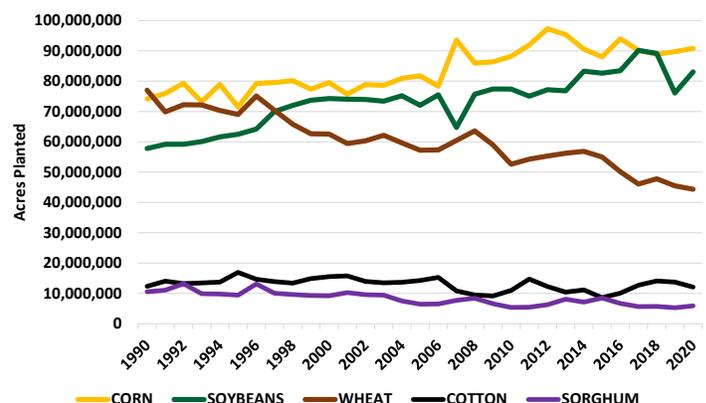
The Outlook Forum briefing report forecast U.S. corn acres to increase from 90.8 million acres in 2020 to 92 million acres in 2021. Soybean acreage was projected to increase from 83.1 million acres last year to 90 million acres in 2021. All wheat acreage is expected to be 45 million acres in 2021, a slight increase from 44.3 million acres in 2020.

The two major questions raised by these forecasts are: 1) Are the acreage projects reasonable, given current market and weather conditions? and 2) Where will the additional acres come from for these higher projected plantings?

Figure 1 shows the historic planted acreage for the five crops with the largest annual seedings: corn, soybeans, all wheat, cotton and sorghum. Notice that in 2017 and 2018, the planted acres for corn and soybeans were nearly identical, at approximately 90 million acres, while all wheat seedings were between 46 million and 47.8 million acres. These values are similar to the current USDA projections.

Continued on page 5.

**Figure 1. Historic U.S. Planted Acreage for Corn, Soybeans, All Wheat, Cotton and Sorghum**



USDA National Agricultural Statistics Service Quick Stats custom query

Another important element that often is overlooked is the amount of prevented planting that occurs each year. Figure 2 shows the historical prevented planting acres reported by the USDA Farm Service Agency (FSA). While the acreage reported by farm managers to the USDA-FSA is not exactly the same as acreage reported to the USDA National Agricultural Statistics Service (NASS), the values are not dramatically different.

Also notice that the prevented planting acres in 2019, at 19.6 million acres, and 2020, at 10.2 million acres, are substantially larger than the previous 12 years. How many of the 2020 prevented planting acres will be available for seeding in 2021 is still unclear. However, given the current dry soil moisture conditions in the western half of the U.S., prevented planting acres very likely will decrease substantially from last year, bringing more cropland acres into production.

In my view, enough cropland acres will be available in 2021 to reach the USDA projected planted acres for major crops. My main question is the balance of acres between corn and soybeans, and what this means for acreage levels for other crops.

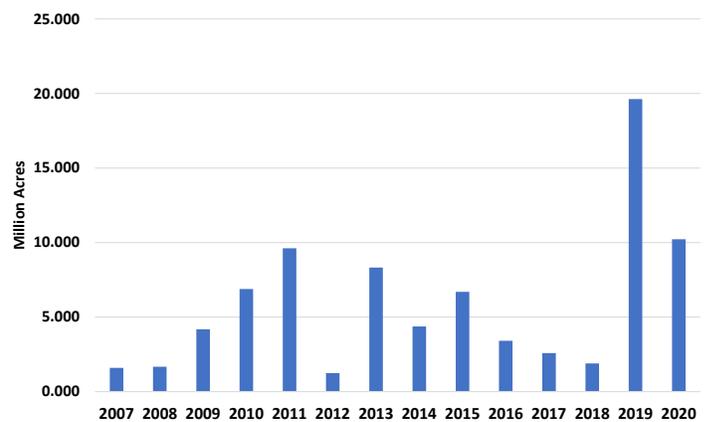
Cotton futures prices have risen almost proportional to soybean futures prices, also stimulated by large Chinese export sales, so a large shift out of cotton and into corn or soybeans is unlikely. In addition, cash sorghum prices are very closely linked to cash corn prices because they are considered close substitutes within the livestock feed industry.

The hard red and soft red winter wheat acres were planted last fall. While concerns exist about winter kill in several of the hard red winter wheat growing areas, a large number of these acres likely will not be destroyed and replanted to corn, soybeans or sorghum.

This leaves many of the crops grown in the northern Plains as possible acres that could be shifted to alternative crops. Hard red spring wheat and durum prices have increased in the past several months but have not kept pace with rising corn, soybean and canola prices. Spring wheat acres likely will be lower in 2021 unless a significant increase occurs in new crop spring wheat futures prices.

Canola cash and futures market prices also have risen nearly proportional to soybean prices, so a major shift away from canola is unlikely. Statistics Canada recently released its initial projections for 2021 planted acreage and is forecasting a 4% increase in canola acreage and a 5% decrease in

**Figure 2. Historic U.S. Prevented Planting Acres**



USDA Farm Service Agency

spring wheat acreage. If this shift occurs, the lower spring wheat acreage should support U.S. spring wheat prices in the 2021-22 marketing year.

The final question is: What will happen to acreage levels of other smaller-market crops grown in North Dakota and surrounding areas? These crops include durum, barley, sunflowers, dry edible beans, field peas, lentils, oats and flax. Many of these crops have pre-plant production contracts available. Firms contracting these crops have been challenged to adjust contract prices to remain competitive with alternative crops such as corn, soybean and canola.

On March 31, 2021, at 11 a.m. Central time, the USDA will release the results of the Prospective Plantings report. This report summarizes the results from a survey of approximately 80,000 farmers in the U.S. The report provides information about expected planted acreage by crop and by state. In my view, this report will have a significant impact on futures market prices until actual planting reports are available later this spring.

# Texas Weather Leads to Decline in U.S. Ethanol Production

By David Ripplinger, NDSU Extension Bioproducts/Bioenergy Economist

An extreme cold spell in Texas in mid-February had impacts far beyond the Texas border. As temperatures fell and then hovered around near-record lows for nearly a week, Texas' grid was pushed to its limits.

Much of the state's wind, coal and gas power went offline due to the extreme cold, just as Texans increased electricity use for heating. The subsequent rolling blackouts were needed to keep the grid from collapsing. At times, power to gas pipelines was cut, stopping the movement of gas to power plants and other customers.

Wholesale prices of electricity spiked to incentivize generators to come or stay online and to temper demand. Similarly, the spot price of natural gas skyrocketed. In some locations, the price of natural gas was as much as 400 times the \$3 price that prevailed before and after the cold spell.

The northern Plains was not immune. Many communities served by utilities that are part of the Southwest Power Pool experienced or were at least warned of rolling blackouts.

Corn ethanol refineries, who are major users of electricity and gas, also were impacted. About 25,000 British thermal units (Btu) of natural gas and a kilowatt of electricity are used to make a gallon of ethanol (these numbers actually vary considerably across plants). The Henry Hub spot price of natural gas, which serves as the national benchmark, saw its daily average rise to \$23 on Feb. 17. For a corn ethanol refinery that uses 25,000 Btu to produce a gallon of ethanol, this would have meant an increase in natural gas expenses per gallon of 50 cents more than normal.

Many refineries went offline during the cold spell. The week ending Feb. 19 had the largest week-over-

week decline in ethanol production in history, about 10 million gallons, or 27% of production. This is even more than declines in March and April of 2020, when passenger travel all but ceased due to COVID-19.

While many refineries stopped production to avoid buying expensive natural gas in the spot market, others did it so they could resell their already contracted supply to others more willing to pay.

The Texas energy crisis is providing a number of lessons about diversification, redundancy, resilience and interconnectedness, even for businesses and people hundreds of miles away from the state's border.

### Henry Hub Natural Gas Spot Price, 2013-Present



Source: Energy Information Administration

### Daily U.S. Ethanol Production



Source: Energy Information Administration

# Economic Uncertainty Persists in 2021

By Bryon Parman, NDSU Extension Agricultural Finance Specialist

We have had two consecutive quarters of gross domestic product (GDP) growth in the U.S. since the recession caused by shutdowns during the COVID-19 pandemic. That typically marks the end of a recession.

Quarter 2 of 2020 had the largest GDP loss in U.S. history for a single quarter at nearly 31.5%. That essentially means the U.S. economy shrunk by nearly one-third in a three-month period from April to June 2020. In Quarter 1 of 2020, the U.S. economy shrank by 4.8%, mostly due to shutdowns in the quarter's final month of March, marking two consecutive quarters of negative growth.

However, as deep as the contraction was in Quarter 2 of 2020, the rebound in Quarter 3 as the economy began to open was just as impressive at 33.4% growth. Most of this growth is explained by the easing of restrictions on businesses during the third quarter of the pandemic which is the July - August period of the year.

Quarter 4 saw a much more modest growth at nearly 4%. In total, 2020 saw a 3.5% decline in GDP, the worst year since World War II.

With two consecutive quarters of growth, the recession may be over by definition, although economists are waiting to see if another drop occurs before making such a proclamation. However, just because the recession may be over doesn't mean that the economy has recovered what was lost, despite the massive third-quarter increase.

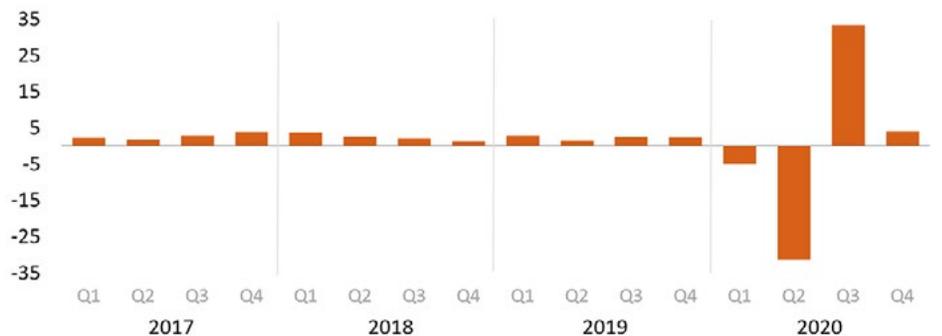
Indeed, new unemployment claims remain very high. The previous record occurred in October 1982, with nearly 700,000

filing for unemployment in a week. Pre-pandemic, new weekly unemployment filings were around 200,000. While we are well below the pandemic high of 6.87 million people filing for unemployment in a week, we are still well above the previous record in 1982, and more than four times higher than the pre-pandemic levels at a steady 800,000+ new people filing for unemployment.

Other economic indicators remain strong. The U.S. is a consumer-driven economy and outside of agriculture, much of consumer wealth is wrapped up in the value of their homes and in their savings portfolio, which includes individual stocks and mutual funds.

Continued on page 8.

## Real GDP: Percent Change from Preceding Quarter



U.S. Bureau of Economic Analysis

Seasonally adjusted at annual rates

Chart from U.S. Bureau of Economic Analysis:  
[www.bea.gov/system/files/gdp4q20\\_adv-chart-01.png](http://www.bea.gov/system/files/gdp4q20_adv-chart-01.png)

## New Weekly Unemployment Filings: St. Louis Federal Reserve Bank



U.S. recessions are shaded, the most recent end date is undecided.

Source: U.S. Employment and Training Administration

fred.stlouisfed.org

# Economic Uncertainty Persists in 2021

— continued from page 7

According to the S&P/Case-Shiller U.S. National Home Price Index, home values across the country are up more than 9% since February 2020. Also, as of this date, the S&P 500 is up 14% since pre-pandemic February 2020. Therefore, many consumers who did not lose jobs or income in 2020 find that their wealth increased considerably in the last 12 months.

However, many of the consumers who managed to increase their wealth though 2020 are not necessarily spending it. The personal saving rate, which is the percentage of disposable income saved rather than spent, increased from about 7.5% in January 2020 to 20% in January 2021.

The personal saving rate tends to increase when consumers face uncertainty about the future and save to meet any unforeseen financial challenges.

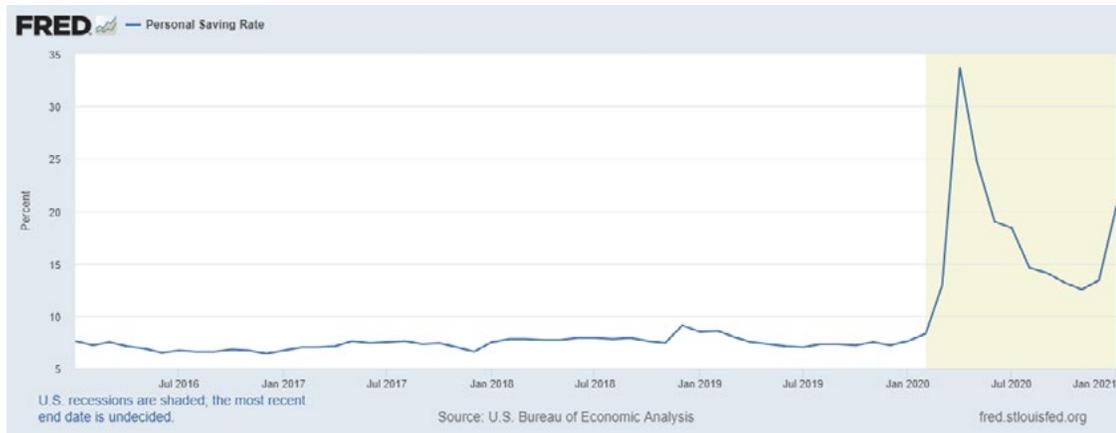
Thus, despite a strong housing market and equities market, consumers are not spending anywhere near pre-pandemic levels, all while unemployment continues to be a drag on economic growth.

In general, uncertainty persists in what 2021 will look like as far as economic growth or recovery. Some investors are fearing high inflation reflected in the steepening of the yield curve should Congress pass another round of financial aid. Others are worried that without an aid package, the U.S. faces another economic contraction at some point during the year, especially if the COVID vaccine rollout isn't as effective as many hope. The only thing certain is that this year will present its own set of challenges as the country tries to return to some form of normal.

## U.S. National Home Price Index



## Personal Savings Rate



## NDSU EXTENSION

## EXTENDING KNOWLEDGE » CHANGING LIVES

The NDSU Extension does not endorse commercial products or companies even though reference may be made to tradenames, trademarks or service names. NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don't use the work for commercial purposes and share your resulting work similarly. For more information, visit [www.ag.ndsu.edu/agcomm/creative-commons](http://www.ag.ndsu.edu/agcomm/creative-commons).

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, [ndsu.eoaa@ndsu.edu](mailto:ndsu.eoaa@ndsu.edu). This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.