

20 Years from Now: An Informed Estimate of the Ranching World in 2039

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Admittedly, our proverbial crystal ball is neither clearer nor more revealing than that of any other who studies beef production, demand, and natural resource use in this great country. What we attempt to do here is consider the current situation, observe the related trends and subsequently how a 20-year time lapse might shape our industry.

Futurists continuously look twenty years (or more) into the future and fill books with their visions of everything from global climate to intergalactic travel. We chose to focus on five areas of great concern to this audience: rural land, world population dynamics, climate change, the role of governments, and finally beef production (Figure 1). While we talk about these independently, we all recognize that each is interrelated with the others.

We begin with the land resource.

1) US Rural Land and Where Will the Cows be Located

What will remain the same

According to the United Nations Food and Agriculture Organization², as much as 70 percent of all agricultural land globally is rangeland that can only be utilized as grazing land for ruminant livestock. The fact that we recognize that there is diversity in land and soil resources and that a mentality of ever-greater production has led to unintended consequences for soils, carbon sequestration, and water retention. There must be a balance between soil and plant biomass, nutrient cycling, and animal grazing.

In the United States, and specifically Texas, the total amount of available rural land has slowly decreased while the urban acres have expanded. At the same time, land values have risen significantly. Investment properties and open space desires have, in part, driven this rise. The average price for an acre of Texas rural land in 2017 was \$2,644 per acre. Since 1972, the average price for an acre of Texas rural land has increased \$41 per acre annually (Texas Real Estate Center). This increase is displayed in Figure 2. Thus, the now fifty-plus year trend of ranches selling and being; a) subdivided or; b) partially or completely removed from domestic animal protein and fiber production will continue.

Texas maintains the privilege that 98 percent of its land is privately owned. This bodes well for livestock production in the state in that the decision to run livestock is made by the landowner. Other states are not as fortunate and this will influence the number of breeding cows in this country. As an example, Nevada has the highest amount of federally owned

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ground of any state at 79.6 percent. The states with the largest federal grazing ground are Nevada, Utah, Idaho, Oregon, California, Arizona, Colorado, New Mexico, Montana, and Washington. In 1980, these ten states accounted for 6.312 million cows. That figure has fallen 12.6 percent to 5.519 million as of January 1, 2019. The condensing of the national cow herd will continue towards the Great Plains assuming water availability does not become an issue. This change in state inventories is depicted in Figure 3.

What will be different

According to the US 2012 Ag Census, the average age of farmers and ranchers is 58.3 years of age. Assuming many of these producers own at least a portion of their ground, in the next twenty years, the US could possibly see the largest turnover of land ownership since the settling of the West. The question will be who will buy the land, particularly at current prices. Who will ultimately control the land resources? What will be their objectives for owning the land and will they include livestock operations? Will the “big get bigger” or will there be a meltdown of rural land ownership as the “willing and available” work force becomes disinterested and/or disenchanting with the role of calf production for the beef industry. If a meltdown happens, who would really be able to recognize when the meltdown happens and have the wherewithal to take advantage of the economic situation? Large cattle operations will have the advantage of economies of scale and quite possibly get larger by leasing grazing or through cooperative arrangements. Very few cattle operations will want to purchase additional land resources and thereby encumber significant capital to simply run more cows.

Those ranches running breeding cows on public land (out west) will be at the whim of the “current” administration (whether it be republican, democrat, or other). As an example, federal grazing fees for 2019 have been lowered, according to USDA-BLM. That portion of the general population that are adamantly opposed to sustainable grazing of forages grown on public lands will still not appreciate ranching/beef/lamb production’s contribution to the local/state/rural economies and high-protein food supply.

2) Population Dynamics of the Planet and It’s Influence on US Beef

The second issue will be the US and World population. Within this population is a diverse group of people who are faced with varying degrees of resources, repression, and assurances from others. The current world population is 7.7 billion. By 2040 (one year after our title year of 2039), the estimated world population will be 9.2 billion. The estimated 2050 population is 10.0 billion people. This increase is depicted in Figure 4.

What will remain the same

Today’s consumer will have aged. The youngest Baby Boomers will be in their mid-70’s, Generations X and Y (Millennials) well into their parenting years, Gen Z will be 27 to 44 years old and Gen Alpha will be finishing college. As a whole, the population will be either 1) Passive, 2) Active, or 3) Radical. Most of the population will continue to be less informed and will

continue to be influenced by the shock and awe media. What the population hears is best summarized by Matt Ridley, author of *The Rise of Fake Science*, “Increasingly, in a crowded market for alarm, it becomes necessary to make the scares up. More and more headlines about medical and environmental panics are based on published scientific papers, but ones that are little more than lies laundered into respectability with a little statistical legerdemain.” The internet will be the “go to” for news, information, goods and services, food and most everything else.

Subsets within the general population include meat eaters, vegans, permaculturists, foodies, rural, urban, the haves, and the have nots, etc. Currently and in the past, consumers have been all or nothing, vegan versus meat eaters. Everyone is concerned about animal welfare. However, the truth is the majority of the population continues to be meat eaters, with small consideration for sustainability. Price and preference continue to dominate selection. The disconnect between the consumer and food production widens.

The rural population continues to shrink, while the number living in or near major metropolitan areas expands. Rural resident (food producer) representation in state and federal legislatures has continued to decrease.

The anti-animal/avian agriculture movement is well-funded and very vocal and visible. Greater consumer naivety regarding natural resource stewardship, animal welfare and food production accelerates progress of this movement. Given the fewer rural, agriculture-involved constituents, elected officials with greater sensitivity to the “anti” concerns have begun to sway their direction. Anti-beef (anti-meat) campaigns will continue to have the privilege of battling the industry.

In a nutshell and unless federal policy changes, the US consumers will continue to enjoy the least expensive, safest and most wholesome food supply in the world, while other countries continue to struggle. The US will continue to lead the effort to feed the world. Our excess domestic food production will highlight the importance of the global market and our export customers. The commodity markets will continue to be very sensitive to political trade disputes, such as the current impact of trade negotiations with China on US pork and soybean prices. Conversely, a lack of leadership integrity, inadequate distribution infrastructure and insufficient financing likely continue to hinder elimination of starvation as a leading cause of death in less developed countries of the world.

What will be different

The share of people who are food insecure globally is expected to fall 10 percent from 20% to 10% by 2028 despite a much larger population. As the population increases, the global market for beef will be larger, also driven by a rise in affluence of low- and middle-class populations.

In 2039, the Generation Z, those born starting in the mid-1990’s through mid-2000’s, will be 40 years old. They make up 24.3% of the population – more than the Millennials, more than

Generation X, and more than the Baby Boomers (whose influence is now waning rapidly). Local, state, and national leaders will predominately be from Gen Z. Therefore, it is important to consider what has and is influencing their values, morals, and beliefs. According to James Emery White (*Meet Generation Z: Understanding and Reaching the New Post-Christian World; Life Way Ministries*), this generation has always been 'wired'; they have never known a world without the internet or cell phones. They take Wi-Fi for granted. Their preferred mode of communication is digital, primarily through social media and texting. They are racially diverse, multi-racial, accepting of sexual fluidity and independent. They have been repeatedly told the planet is deeply troubled. Most have no personal recollection of 9/11 and have only known a world where terrorist attacks are the norm. They have lived through the great recession and have seen their parents and others lose their jobs and struggle financially. They are justice-minded. They are post-Christian and many Z's are growing up in homes where there is no religion whatsoever, so they have no experience of religion. However, most believe in God and are open to faith, but because they have no acquaintance with the Gospel, they turn to the internet and social media to answer their questions.

Their eating choices will consist of meal kits, prepared meals, and online grocery. The consumers will want more convenience along with sensory experiences. If they cook at home, then they will rely on online recipes and cooking videos rather than what their grandmother or mother prepared. They will not have a routine lineup of meals for the week. When they shop, it will be to fulfill their meat needs one meal at a time. These contemporary consumers, especially for those living among or near large populations, will experience same day grocery and meat delivery via autonomous vehicles and drones equipped with lockers. Food made-to-order and delivered just-in-time will reduce waste and appreciably extend the utility of the food we produce.

Consumers today and in the future, will seek adventure with their meals including bolder flavors and multisensory experiences. Insects are currently being offered in select markets across the country, but have been eaten for centuries in other countries.

Apart from a hands-on shopping experience, brand recognition and loyalty will be more important. Negative experiences with products will be less tolerable and more widely publicized (via social media, consumer reviews). Absent a familiarity and/or experience with, and confidence in, a brand, one negative experience will potentially taint a category (beef) and will likely move the consumer to another animal protein.

At the advice of their medical advisors, their diets may be genomic and medicinally based. They will be advised to balance their diet between plant-based and animal-based products. More radical advisors will inform them of the Syndemic. Traditionally, syndemic has been used to describe the interaction of diseases. However, according to the Lancet Report, the term is now being borrowed to emphasize the links between an unholy trinity—climate change, obesity, and malnutrition—which interact, co-occur, "and share common underlying societal drivers,".

3) Climate Change and Weather Influence

What will remain the same

The climate is changing, that will remain the same. The release of greenhouse gases (GHG) into the atmosphere has been and continues to be ongoing. The question is not who or what was the cause, so much as what, if anything, can or will we do about it. Biased research reports have created an environment of misinformation that continues to be referenced, inaccurately. It is difficult to “un-ring” a bell. The science-sound reliable information, according to the US-EPA, is that the largest sources of US GHG emissions in 2016 were electricity production (28% of total emissions), transportation (28%), and industry (22%). “All agriculture accounted for a total of 9%.” All of animal agriculture contributes less than half of this amount, representing 3.9% of total US GHG emissions. Furthermore, according to United Nation’s Food and Agriculture Organization’s statistical database, the total GHG emission from US livestock has declined 11.3 percent since 1961, while production of livestock meat has more than doubled. This is truly an extraordinary feat that needs to be front and center in the media. As an industry, we recognize that cattle continue to be up-cyclers of low quality, human inedible carbohydrates and convert forage into a high quality, high-protein product - beef.

Yet, activist groups, media, and some elected officials point to agriculture, and specifically cattle, as the industry that must disappear or at least change their production practices to reduce GHG emissions. Few of these groups, as well as the general population want to change their habits to combat GHG emissions and climate change. Everyone likes to travel, but no one wants to walk or ride a bike (transportation accounts for 28% of the GHG emissions). Very few US residents can remember living in a house without electricity, further, no one wants to (electricity production accounts for 28% of GHG emissions). Very few want to return to the early 19th century, but by targeting modern animal agriculture, that is exactly what these groups are trying to impose upon the populace. We all benefit from the use technology, transportation and communications specifically, but ‘technology’ is easily blamed for contributing to climate change.

What will be different

Climate change has been touted as the greatest threat to the wellbeing of mankind for at least three generations. Unless science and sense prevail, the two youngest generations (if not more) will be completely convinced human activity is a primary driver of this change. Therefore, humans will feel obligated to intervene and alter this change. Hopefully the emphasis of these climate alteration efforts has shifted to something with greater potential (than agriculture) for reducing greenhouse gasses – options will include a further reduction of fossil fuel use and alternative source power generation.

Anti-meat activists will find new, “absurd” legislative and regulatory approaches to advance their agenda (current example - the proposed Green New Deal). The push for Meatless

Monday is a good example of their tactics. However, according to Frank Mitloehner, University of California – Davis, if the Meatless Monday were to be adopted by all Americans, we'd see a reduction of only 0.5% of the GHG emissions.

The beef industry participants must speak with a common voice to tell our success stories. None of us can afford to be passive in this fight.

4) US Government

“The whole aim of practical politics is to keep the populace alarmed (and hence clamorous to be led to safety) by menacing it with an endless series of hobgoblins, all of them imaginary.” H.L. Mencken, American Journalist, 1880-1956. This quote seems more relative now than when Mr. Mencken said it in the early 1900's.

What will remain the same

We wonder whether this country's politics will ever be able to return to the period of statesmen when early politicians, who were Americans first and politicians second, recognized the role of debate, democratic voting and the majority wins. Today's environment of polarization of the US population and radical politicians pushing a socialist agenda have become the norm.

The effect of this on the cattle and beef industry is huge. First, unless the federal policy changes, the US consumers will continue to enjoy the least expensive, safest and most wholesome food supply in the world. At its most fundamental basis, a cheap food policy, which was founded on the need to feed the nation following World War II, has now moved into the arena of garnishing votes by providing entitlements to political constituents. Second, the government's role in trade negotiations influences short- and long-term prices, including cattle and beef prices. Third, governmental regulations spanning the horizon from Western states public land policy to antibiotic use for animal health to defining milk and meat impose pressure on cattle owners.

What will be different

Ag producers as a whole can no longer afford to have a cheap food policy. The government finally recognizes that entitlements lead to a dependent and unmotivated population while the need to reduce the federal budget (via reduced agricultural support) forces more agricultural producers out of business. At what point is the national security called into question because of fewer food producers and insufficient food production? Can/should we rely on imports from other countries to support us?

Politicians with an agenda will attempt to exhort their bias on the entire population under the guise of climate change. As an example, professed vegan New Jersey Senator and announced 2020 US Presidential Candidate Cory Booker proposes an end to animal agriculture if elected.

Government regulations will exert pressure on many fronts. Diet choices will be influenced via school lunch programs, the USDA Food Pyramid and the Dietary Guidelines Advisory Committee. Will these regulations be based on nutrition science or dictated by political action committee dollars? The federal dietary guidelines provide the basis for the educational components of all 15 federal nutrition programs administered by USDA. The government will decide the role of fake meat, how it's processed and how its development will be regulated. By federal definition, milk and meat include nut extracts and artificially grown muscle cells. Will the sugary drink industry will become the new tobacco industry and be penalized by something similar to the 'sin' taxes imposed on tobacco and alcohol? Will the government allow the health insurance industry to charge based on body fat Indexing and genetic predisposition to illness? Improved understanding and interpretation of the human genome may change the availability and cost of health care (ex. body fat indexed health care premiums) and result in 'prescribed' diets to support health and wellbeing.

5) US Cattle/Beef Industry

The cattle and beef industry will be subject to each of these issues. Furthermore, it will have its own issues to contend with.

What will remain the same

US ranks third in the world-wide number of cattle inventories, yet produces 20% of the world's beef with only six percent of the world's cattle. Within the US, approximately half of the breeding females are housed in herds of less than 50 breeding females. Unless these small herds join forces (cooperatives, etc.), calves will be sold at local livestock auctions (typically on an individual basis). Timing and availability of these calves throughout the year and around the country allows twelve-month availability of calves. Management of the "larger" herds will continue to search for the highest price among limited buyers.

Regardless of herd size or location, breeding cows will be limited to one calf per year and weather will remain the greatest influencer of weaning weights. As pointed out time and again, weaning weights have not increased nationally for the past fifteen years. This is a function of weather, not genetics.

Cost of production will continue to rise annually, putting pressure on the absolute need to maximize production, starting with reproductive efficiency demonstrated by breeding females. Fixed costs will continue to rise, putting pressure on maintaining a resource-sustaining stocking rate. An annual budget along with a capital asset purchase plan are essential tools, just like a pocketknife or a rope. The largest variable cost will continue to be feed. Skilled ranch labor will be difficult to secure. As the cliché goes, "Skilled labor isn't cheap, and cheap labor isn't skilled."

USDA's general expectation is for continued declines in real agricultural commodity prices over the next ten years, according to Robert Johansson. The Chief Economist says, "Falling commodity prices are the result of continued production growth, which continues to outpace global demand." According to consensus during the Ag Outlook Conference held February 21-22, 2019, changing federal policies (domestic and foreign trade policy) will continue to exert pressure on commodity prices.

In Texas, non-livestock enterprises (wildlife, recreation, open-spaces, non-consumptive ventures) contribution to total ranch revenue will be relatively minor, but will make up well over half of ranch net income.

What will be different

Large herds will partner with end-users (suppliers of beef to the consumer) to create the "perceived" perfect calf and subsequently the perfect beef product. This product will then be distributed to a peculiar and particular growing customer base. Genetic selection, feed programs, and health programs will be determined by a "team" made up of representatives from the entire food chain. Weaning weight will no longer be fodder for bragging rights at the local cafe. Profit-driven sustainable beef producers will focus on metrics such as marketable product per acre, unit cost of production, return on equity, liquidity, debt to asset ratios, total ranch net income, etc.

Individual animal identification and Beef Quality Assurance will be standard practice for larger operations and those willing to work at capturing the added value. The value/price disparity (driven by consumer expectations) between lots of value-added, known-source and treatment feeder cattle and those with unknown history will be financially significant.

Relatively higher feedstuff prices, without an associated increase in cattle prices, will force adoption of sound sustainable grazing management by stewardship-minded resource managers, thereby reducing feed costs. Likewise, attention to mature cow size and milk production potential and coordination of cow nutrient requirements with nutrient content of forages will improve efficiency and reduce unit cost of production.

Specific expenses will be changing. Agricultural lending will continue to change as ag banks are merged with larger banks. Development of integrated and risk-managed production systems may attract financing from non-traditional sources such as allied companies with a stake in beef production. Labor will be difficult to secure and relatively expensive. Animal health protocols will be restricted by regulation of antibiotic and vaccine availability and use.

Technology will reduce labor requirements. Robots supported by artificial intelligence will replace people performing 'routine' tasks. Among finishing animals, resident biosensors monitoring animal health and performance will communicate real time information to a central hub. Automated sorting technology can separate animals in need of attention from a pen or larger group. Where weather permits, drones will play a significant part in monitoring forage

conditions, animal inventory and infrastructure. Global Positioning System technology in an ear tag will facilitate location, containment (virtual fencing) and monitoring (accelerometer) of livestock.

Assuming cellulosic ethanol production has not contributed as projected and the Renewable Fuel Standards have not been amended, an appreciably larger portion of US grain (corn) production will be devoted to ethanol. More ethanol may not translate into less expensive distiller's grains. Changes in the processing of distiller's grains (fat extraction) may facilitate their use in pork and poultry production (both domestically and abroad) as a protein source (surely of lesser quality than soybean meal).

Improvements in genetic evaluation and selection of replacement females combined with improved health and reproductive management will increase cow longevity and potentially reduce depreciation cost. Seedstock breeders will capture the genetic potential of their stock by leading the effort to integrate beef production across the cow/calf, stocker and finishing segments of the industry. Cooperative genetics-sharing and marketing arrangements with commercial cow/calf operations (both small and larger) will broaden the impact of a few progressively-minded breeders. Individual animal identification will facilitate communication, inventory management and consumer confidence in these systems.

Conclusion

Current trends and patterns suggest that by 2039, the greatest challenges faced by ranchers, general managers, and natural resource stewards will involve regulations and legislation in a social/political arena, well outside the perimeter fences and far removed from rural America. Addressing these challenges will require much more than rising before dawn and returning home after dark. Agriculture's opponents are well funded and have ample time to pursue their cause. Agriculture must invest time, create and capitalize on opportunities to engage the consumer, and tell our story of stewardship, stockmanship and sustainability. Stakeholders must also invest financially – supporting organizations and individuals who've demonstrated the capability to rise, lead, meet the challenges and make a positive difference.

At the ranch, managers must employ a "systems" view and continually improve – soil health, grazing management, stockmanship, reproductive efficiency, animal health, growth, carcass merit, food safety and quality and ultimately consumer satisfaction. Current profitability drivers will remain powerful management leverage points two decades from now – cost management, production efficiency, aggressive marketing.

Modern agriculture is neither for the fearful nor faint of heart. If it were, any one of several other countries would have risen to the challenge and be leading the charge to feed the world. What a humbling privilege is to be an American involved in agriculture.

Figure 1. The Cattle/Beef Issues

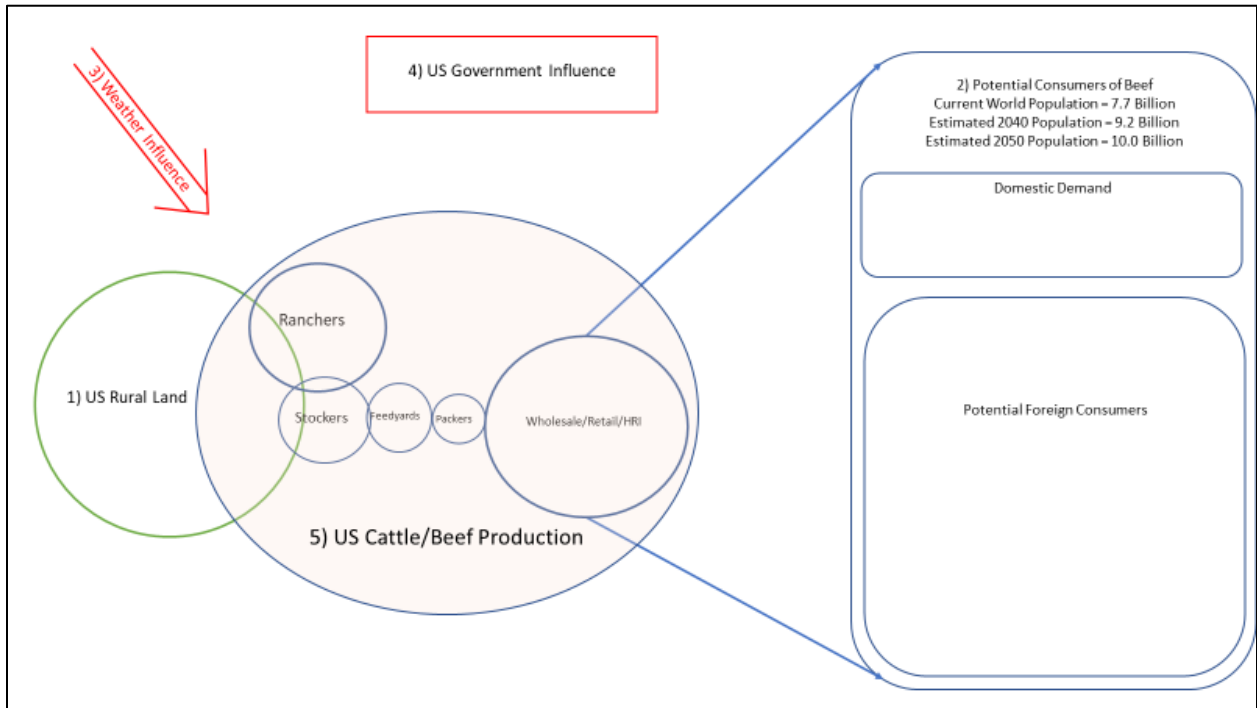


Figure 2. Rural Land Prices for Texas.

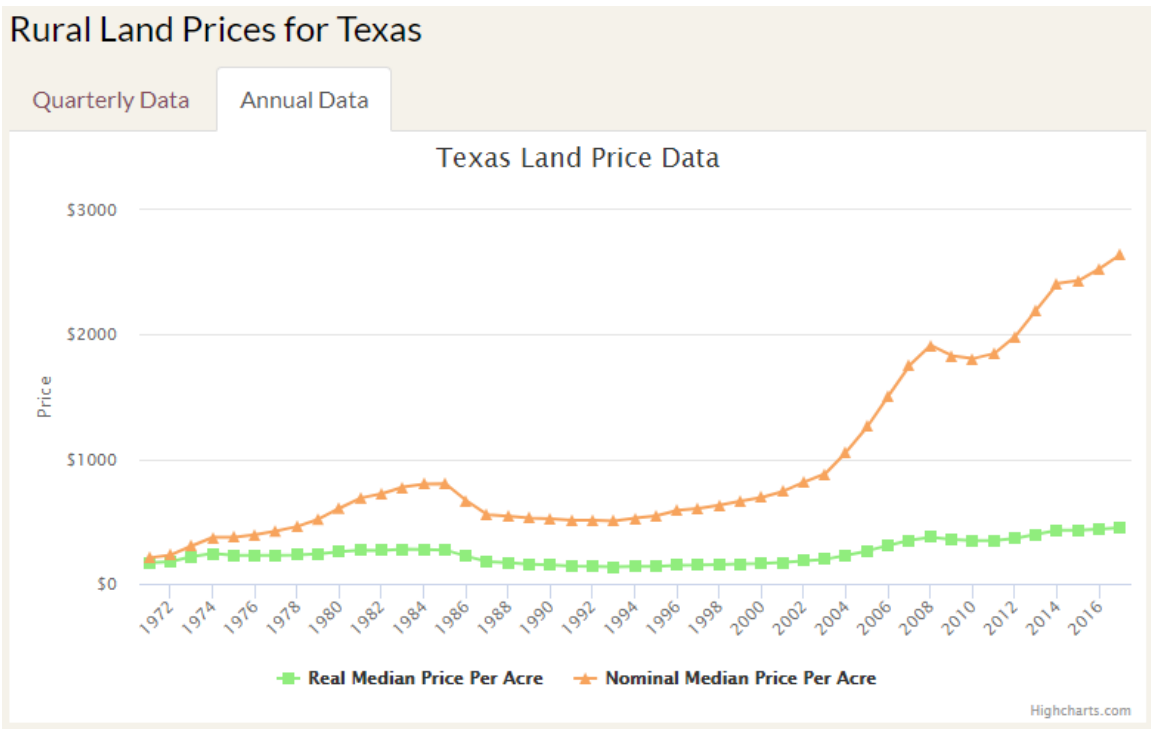


Figure 3. US Beef Cow Inventory 1980 and 2019

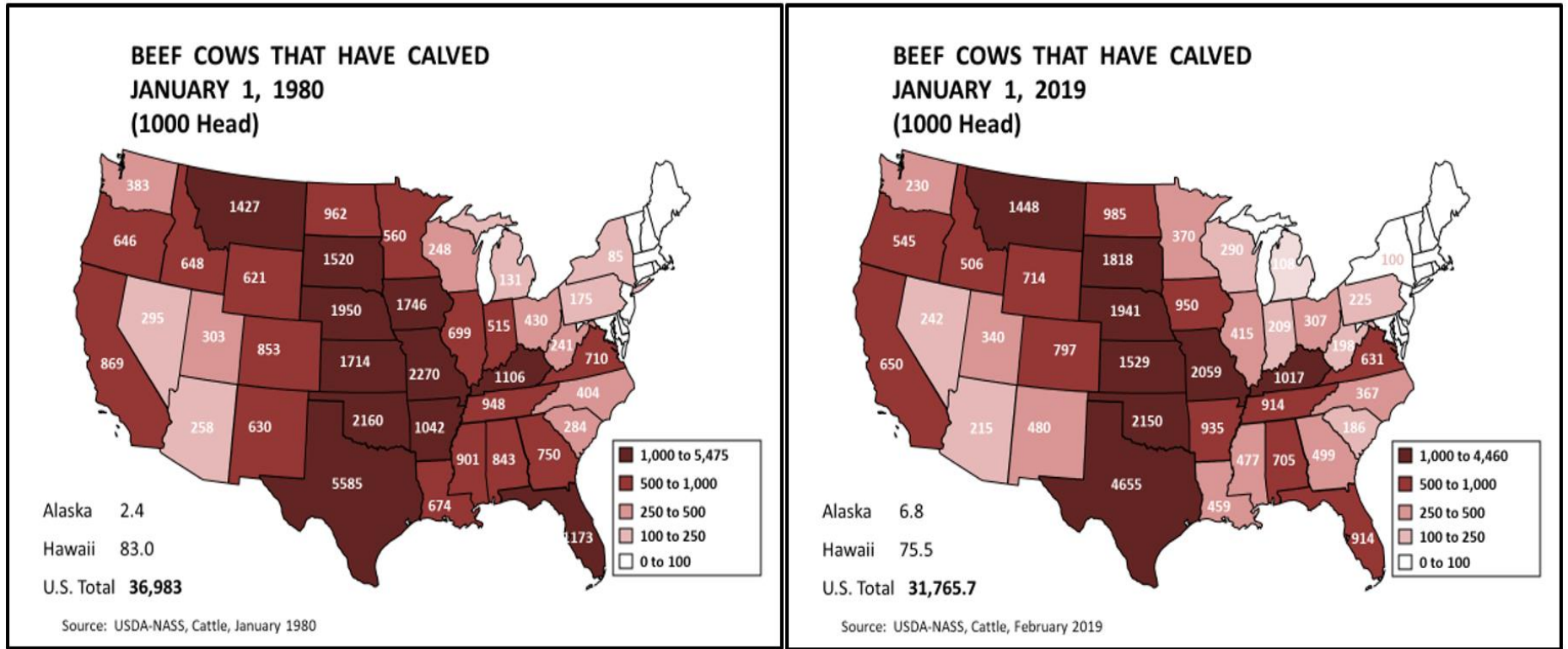
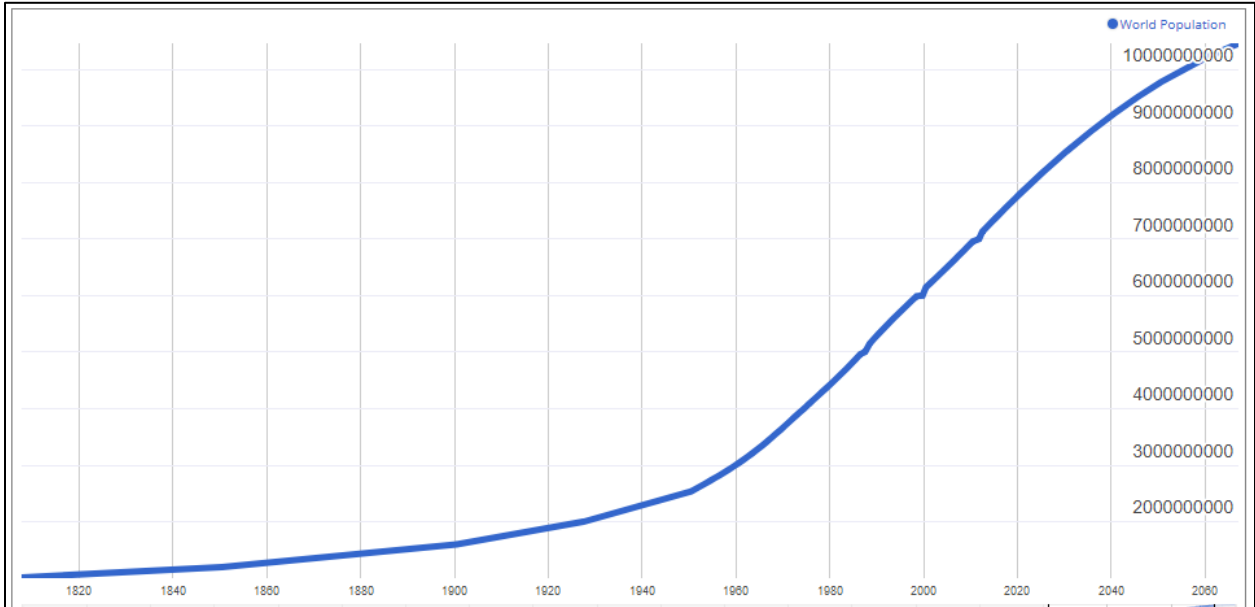


Figure 4. World Population, Current and Projected.



<http://www.worldometers.info/world-population/>