

The Past 30 Years

Things That Have Made an Impact – Things Which Have Come and Gone

Ivan G. Rush
Extension Beef Specialist
University of Nebraska-Lincoln
Panhandle Research & Extension Center

As one reflects back over time and considers all of the products and concepts that the beef producer has had to decide on, whether it would be beneficial either short or long term, it may give some guidance in making future decisions. We need to first acknowledge that the beef industry has made progress in production efficiency as can be seen in Figure 1. As can be observed, we have had about a 15% increase in beef produced with a 21% decrease in cattle inventory in the past 25 years. Even though this is an indication of efficiency, it is somewhat lower compared to efficiency changes in swine and milk production (Figure 2 & 3). The swine industry has 28% less sows and produces 50% more pork and the dairy industry has about 30% less dairy cows and produces 30% more milk. A problem with this data is that it primarily takes into account output, and not cost of production, which is related to efficiency, but not always a good indication of costs and loss with profits.

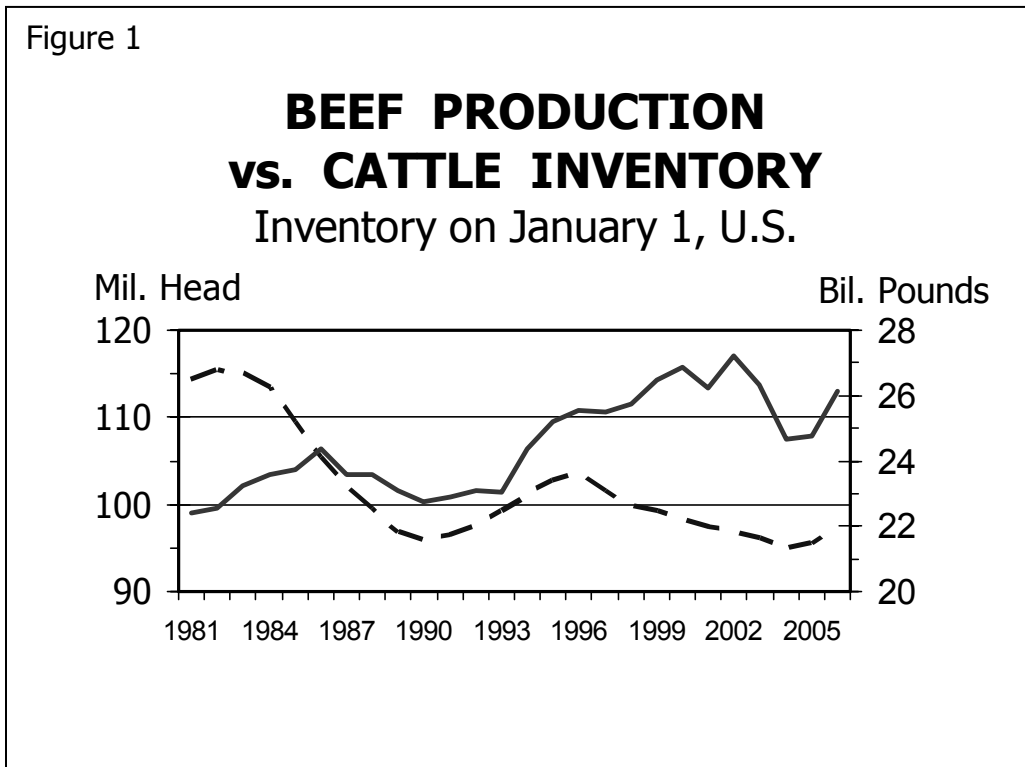


Figure 2

PORK PRODUCTION vs. BREEDING HOG INVENTORY

Inventory on December 1, U.S.

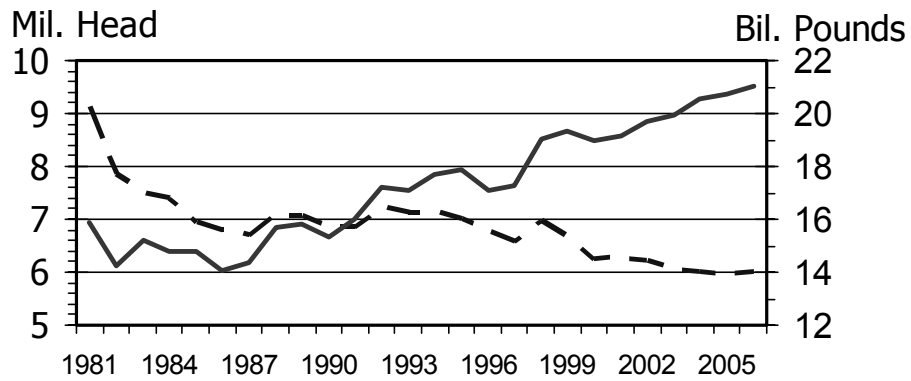
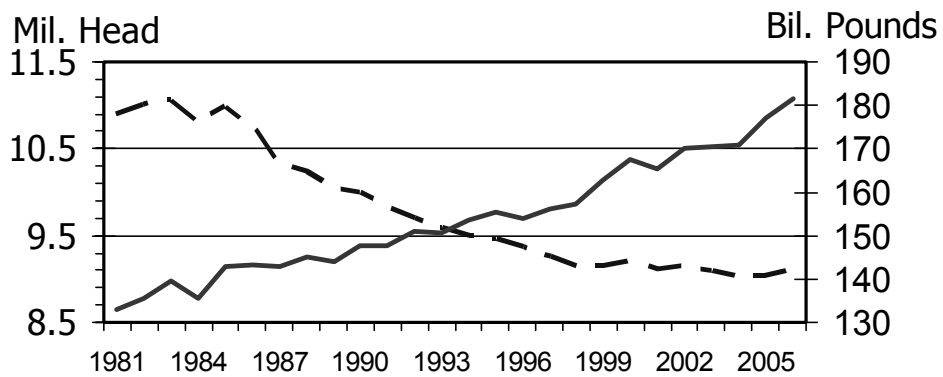


Figure 3

MILK PRODUCTION vs. MILK COW INVENTORY

Average Annual Inventory, U.S.



It seems to me that the bottom line on whether products or concepts are ultimately utilized long term is based on a basic question of whether or not they are based on sound science and if they are practical or applicable. Of course, ultimately it has to have sustained profitability, while maintaining the environment or it will not stand the test of time.

Sound science has two elements. First, in most cases, it must be explained by basic science. This is how the most basic discoveries are made. Rumensin would be a good example. It was used for a poultry coccidostat and was on the market, but some laboratory scientists questioned if it could alter rumen fermentation. Studies showed its effect first in a test tube to confirm it would alter fermentation, how it effected fermentation, and how that could be a potential benefit. The second part of sound science is to have the product tested in many replicated unbiased experiments. After experiments are conducted in smaller research pens, they need to be taken to the environment where they will ultimately be marketed.

The industry has seen many more products introduced that are utilized today. Most have gone by the wayside because they didn't provide value. Many feed additives are the first to come to mind, such as inactivated microbials.

Admittedly, many of the products are currently on the market and have offered value in some studies, but many have gone by the wayside. I used to have a shelf in my office that held many products that salesmen had left or sent to me with, in some cases, outlandish claims. In some cases, the additives were simply a concentrated nutrient or product produced in rumen. In other cases, it was such a super product that had "just been smuggled in from South Africa in a person's shoe," so they couldn't disclose the ingredient. They still haven't and it is not important because they are no longer in business.

We can think of several microbial additives that held great promise. Many contained lactobacillus (of which there are many different strains), aspergillus oryzae, and several enzymes. The problem is, these organisms, or enzymes are already present in very high quantities in the healthy rumen, so small additions may have limited benefit. Yes, they are beneficial and yes, the basic science is sound, but many research trials have not shown a consistent benefit. The same products are used in silage fermentation and have shown economic benefit in many trials. Some companies use acids, again already produced in huge quantities in the normal rumen, so it is comparable to the benefit of adding a drop of water to a barrel. At one time, I had many calls on the benefit of adding a Shakley product (soap) to cattle rations. People were buying it in 55 gallon drums and producer claims included everything from faster growth, easier calving (because of the slippery soap I suppose), better breed back and no scours. One purebred breeder told me, "It just seems to put a shine on my bulls."

A side note on producer testimonials sometimes based on "tests." They are great and needed because producers can give products a real world test, but be careful of conclusions such as, being compared with last year "where every thing was the same" or "I had the cows up north on the product where the pasture was worse and I had higher breed back." Salesmen will relay "that since Joe has been using the product, he hasn't pulled a calf – from his three cows." Almost equal concern comes from feedlot tests where the 900 head of yearlings are split and close outs are compared, but no statistics are applied.

An enzyme product has been offered for 50 years, and has claimed to do many things, including producing higher quality meat. I can remember the number of trade shows in the past years that I have gone to where they had delicious rib roasts cooking and were offering samples of prime rib cooked to medium doneness. Of course it was delicious, but how much was due to the enzyme, and even if so, could the delicious beef be sold at the feedlot at a premium? Where

were the replicated unbiased trials they conducted? At one time, Conklin called on me frequently and claimed many things, primarily animal health if their product was used. Even though the company is still in business, I am no longer called on nor do I get producer inquiries.

I have probably been too negative on microbial additives and their salesmen. I know that many who sold the product believed in what they were selling and wanted to benefit the industry.

I would also compliment the companies that have done a tremendous amount of laboratory and practical research and continue to look for “better more sustained bugs” and places where they are most beneficial. Companies such as Pioneer and Alltech come to mind as examples, but there are many more. This is even more important today with all of the interest in “natural beef.” Some companies are looking for alternatives to drugs that are considered to be antibiotics or hormones by the FDA.

I would say that academics also had had their share of misses. Often times it is a concept that looks good in research, but lacks practical application. Two feed additions that come to mind are oyster shell and cement dust in finishing rations. We were in a time when the industry was looking for ways to replace roughage in diets. A prominent scientist at Colorado State University did some work in evaluating oyster shell that was routinely used in layer rations for egg shell strength and felt it could replace roughage in diets. The feed industry and the media got all hyped and numerous articles were written and advertisements published. But then, others in the industry, plus some early innovators, started feeding oyster shell and suffered acidosis problems and thus oyster shell feeding was short lived. This scientist was an excellent researcher and probably could be called the father of steam flaking, which is now utilized in the majority of major feedlots, plus he has had many other significant research concepts. He was also an excellent teacher and touched the lives of many students at both the undergraduate and graduate level, but this was one feed ingredient that needed more testing before recommending.

At this same time, Farmland Industry developed and marketed Ruff Tabs, a plastic, flexible square one inch cube that was to be fed, where it was to stay in rumen where it was to serve as the “roughage factor,” by scraping the rumen wall. The only problem was, they passed on through the cattle, so soon we were feeding high concentrate diets without roughage, which can be very efficient if managed without acidosis.

Another example of a research scientist that made some science sense, but failed, was feeding cement dust or finely ground limestone. A small test was conducted with feeding cattle cement dust at a USDA research station at Beltsville, Maryland where positive results were found in rate of gain and feed efficiency. It was theorized that it was all in rumen acid control. That research was later brought to the USDA MARC at Clay Center, NE where finely ground limestone was also utilized. Again, the feed industry and media hype picked up on this and many research trials were initiated across the country by academics and the feed industry. In the mean time, one of the MARC trials was published in the Journal of Animal Science. Trial results from other research trials started to be reported from around the country with some slightly positive and some slightly negative or on average no effect. Interestingly, soon after, we all received a letter stating that the researcher had falsified some of the data and an error report would be published by the Journal of Animal Science. Although this is an extreme example and somewhat a black eye for the research community, it points out that when early innovators accept some technology without tried and tested research, they must take the risk.

Another concept that has come and gone is the free choice or cafeteria style vitamins and minerals, where all sources of vitamins and minerals were offered in small individual compartments or small blocks. The theory was cattle had conventional wisdom and would select

the vitamins and minerals they needed to coincide with their requirements, and would gain faster than conventionally fed cattle. What was overlooked was that kids in a candy store overeat what they like. Controlled research was conducted at the Panhandle Research and Extension Center (PREC) with yearlings on summer pasture and found that cattle consumed supplemental Vitamin A (actually its carrier) at extremely high levels despite the fact that cattle were receiving tremendously high levels of Vitamin A (carotene) in the lush green grass. Some controlled research trials were conducted and found that cattle did not have enough conventional wisdom to eat a balanced and economical diet. I haven't had a question on this for several years.

A side note on label claims. No claims can be put on a label (feed tag, etc.) unless it has been approved by the FDA, which will be based on many unbiased tests. As a result, a person representing the company should not make claims unless FDA approved. Of course this is repeatedly violated verbally and practically impossible to enforce by the FDA, so if a claim is made verbally, the producer can ask if they have a label claim as such. If the answer is no, it still may be a good product, but the research has not been submitted, or if submitted, it has not been approved by the FDA.

Products that have made a tremendous difference in the cost of producing beef are:

- Ionophores; especially Rumension, improves feed efficiency 3-7%.
- Implants; all FDA approved, increases gain 5-15% and feed efficiency 3-10%
- Antibiotics; not only for treatment, but Tylosin for liver abscess in feedlot diets
- Insecticides; All FDA approved, both internally and externally. Not finely ground sea shells

I have estimated that if you do not utilize these products, your cost of production will increase about \$10 per hundred weight or over \$100 per head of a finished animal.

Cross Breeding

When I first came to western Nebraska, producers either had Hereford or Angus, and they argued which was best. Some of the more traditional ranchers questioned why you would want to cross breed and felt the black baldy calf should only happen if the neighbor's bull jumped the fence. Then, early in my career, a few brave souls started using black baldy cows and crossing them with Charolais bulls. I was at a large cattle conference and a prominent rancher from Montana and sought after speaker said, "You won't find any of that mule beef on my ranch," which got a round of laughter. Soon, some of those that used the Charolais had frequent calls to their veterinarian with calving problems, which gave coffee shop talk conversations some ammunition that hybrid vigor just won't work in cattle.

The industry then went through a tremendous change and the USDA Meat Animal Research Center at Clay Center, Nebraska, started evaluating a few of the imported European breeds available, primarily through Canada. As a result, many raced to produce high percentage cattle in breeds like Simmental, Gelbvieh, Maine Angou, Charolais, and Limousin. Soon, there were several ranches with essentially pure breeds, only based on resources in Europe. All this time, academic professionals were talking up the advantages of heterosis, but missed the point of practical application. They gave numerous talks and wrote publications on the advantages of long range two and three breed rotations which was sound, factual science. They showed data on the percentage increases possible when using the various systems. This was also during a time when ½ to ¾ blood bulls were called crossbreds and to get the full advantage of heterosis, we needed to use pure breeds in the crosses. Two problems occurred with the planned cross breeding concepts. First, research and extension specialists didn't offer to build fences for more

breeding pastures or took fully into account the need for accurate records on all females, and ranchers' willingness to keep those records, plus the differences in ranchers that wanted to keep replacement heifers. Second, as new breeds were being introduced, some of the breeds that ranchers were using had a narrow genetic base in the U.S. and breeders were few and far between, plus some had lost acceptability on traits such as temperament, so ranchers did not want to stick to a long-term plan – “a planned breeding program.”

I believe the industry has finally found the middle road on heterosis by utilizing composite bulls, which were formerly called cross breeds. The main difference today is that the composites are coming from breeders that have a long history of supplying quality genetics and have selected the genetics to produce under the environment that they consider to be the majority of their customer's conditions. Also, most producers of composites still produce some purebred stock for those that prefer purebreds.

Currently, because of the tremendous success of Certified Angus Beef (CAB), the industry has colored their cow herd black. This has been done somewhat by coloring the Continental cattle black, but also by using many black Angus bulls for one of two generations. This has gotten a consistent black hide color, but has given up heterosis, and in some cases has hurt traits that are lowly heritable especially reproduction. Some Angus producers even suggest you can accomplish just as much within the breed by using “out crosses” and because of the Angus superiority over other breeds that you do not need to cross breed. If you assume that black Angus is a pure breed, then heterosis is lost when using only Angus genetics, which will sacrifice performance compared to other cross breeds with equal genetics.

Another tool that cattlemen have available now that has had a tremendous positive impact on cattle selection is the development of expected progeny differences (EPD's). Jim Gosey, former beef specialist at UNL, pointed out that we now have tools available to breed first calf heifers with minimum risk of calving difficulty and yet good feeding performance and maternal ability in the females. EPD's were not readily accepted by many breeders when first released. One prominent Angus breeder stated to me, “This will be the ruination of the Angus breed if you university people keep promoting it.” Today, the breed has grown tremendously and that breeder now publishes EPD's in his catalog.

We have not always used measurements wisely though. Frame scores are a good example as a tool we used in the 70's. There was a rush to select for more height. We assumed that a frame 7, apparently because it was a bigger number than 6, must be better, and a frame 9 would be better yet. We probably needed to add some added volume and growth in some early maturing cattle, but we went past what was needed. My dad once told me that a steer should weigh just as much lying down on the scales as standing up. As a result of the “frame game,” we found hard keeping low milking and thin cows. Now I believe we are going the opposite direction and I question if we will again overcorrect with very small frame early maturing cattle.

The Packing Industry

Several years ago, I was asked about some of the major changes I had observed in the beef industry. One of my comments was a change in the packing industry and the fear of the power of the “big three.” The response was that it had not changed as we still had the problem. I reminded the caller that the “big three” were Wilson, Swift, and Cudahy that “controlled the markets on the river.” Then a group of cattle feeders gathered in Iowa and decided enough was enough and they would build a plant and slaughter their own cattle. This became known as IBP (Iowa Beef Processors), and now Tyson. Another group of feeders formed a cooperative to

harvest cattle in Rockport, Missouri, and built a modern packing plant that is now known as Excel Corporation. Warren Monfort thought it made no sense to ship cattle to the river markets from his largest feedlot in the world (over 50,000 head) in Greeley, CO and built his own packing plant that was known as Monfort and now Swift.

The point of this is to point out that in a free enterprise system when a business becomes less efficient than a competitor, they will fail or be sold. I believe we have the most efficient beef processing system in the world. This was recently brought to light when I was “working” in Argentina. I was constantly questioned about the spread between the fed cattle and retail prices. They repeatedly told me that their margin was much greater mostly because of a less efficient slaughter and processing industry.

I realize this is controversial because many believe the packers have too high profits, although many choose not to invest or apparently believe that free enterprise is not real nor do they acknowledge that packers also see red ink at times. I am also amazed to see the tremendous animosity shown towards the packers – cattle feeders file lawsuits one day and then price cattle to them the next day. I also find it interesting how many cow-calf operations find the packers as evil and yet they have never directly sold them one animal. They sell their cattle to the feeding industry. I understand what frustration one can encounter when cattle are sold at a loss and I also understand that it is human nature to blame others when a loss is incurred. Until a better alternative for selling our finished cattle or cull cows is found, I believe we need to find ways to work cooperatively with the current system. The only ones I see gaining long term by suing the packers are the lawyers. Perhaps our current system can be made better and I believe that we have a dog-eat-dog free enterprise system in effect in the U.S. (I believe it is being challenged more all the time by “do gooders” and bureaucrats.) Just as soon as any packer becomes inefficient they will be replaced, just as they were in the early 60’s.

Cattle Handling and Beef Quality Assurance (BQA)

Two very positive things that have helped in producing quality and safe beef is the manner in which cattle are handled and the way products are injected.

Dr. Temple Grandin and Bud Williams, animal handling specialists, have had a tremendous effect on handling cattle quietly and more efficiently. Dr. Grandin has had a tremendous impact in the design of cattle handling facilities that make it much easier on cattle and people when processing. It is hard to visit a cattle working facility without seeing some of the concepts or designs by Dr. Grandin. Bud Williams has given remarkable insight and training on how to train and move cattle with a minimum amount of stress.

Processing of cattle has also changed with good BQA programs. Even though several complaints were heard when it was requested that injection sites be kept in front of the shoulder, of course this is now regarded as “the injection site” for any producer that cares about the quality of the product they produce.

In summary, many products have been presented. Those that we utilize have stood the test of time and have been based on sound science, and yet practical, which has led to profitability. We will be blessed with many more new things in the future and this acceptance and success will be based on the same principals that proved the past ones successful.