



BeefTalk 649: Apoptosis

SUPPORTING MATERIALS

Apoptosis:

cells are programmed genetically to be eliminated when their purpose is done.

The process in which individual cells are programmed genetically through their DNA to be eliminated when their purpose is done.

Sometimes one just needs to wonder and dream to learn something new. With all the excitement about DNA in the cattle business, one cannot help but learn something.

The cattle business is a fairly conservative business that is operated by fairly conservative people. As risk-takers in a high-risk environment, those in the cattle business have learned that conservative management seems to keep the operation around longer.

Maximum return is not the goal. Generally, the primary objective is a rather consistent return that gives the

producer an opportunity to be around next year.

In some cases, the newly arrived expert is even perplexed. Why not listen to all the inputs, chitchat and multitudes of opinion and allocate all the dollars accordingly? The wiser, more experienced will say that with patience comes sanity, and with sanity, one still can appreciate raising cattle.

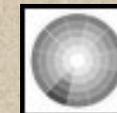
As cattle are sold and move through the production chain, the cattle may decrease in importance, but their investment opportunities may increase. Profit and loss actually may not be a product of burning the midnight ranch oil, but more embedded in the markets and how they move.

Spot markets always are active, but actual value and profit and loss are a long chain of accounts, with some being negative and some positive. The true value of a calf may have very little to do with who comes out on the positive side of the equation versus the one who loses.

However, back on the ranch, this year's calf crop is just starting to unfold, and attention is much more focused on survival, livability and brute strength. In fact, calf value probably is not even mentioned very often. Although a 0 percent calf death loss is desired, the reality is that an operation will experience some loss. However, focusing on dead calves is futile because there is always a live calf on the way.



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Now back to the conservative nature of ranching. Cattle are really not much different than the producers who manage them. Cattle that survive need an array of tools to fend off the elements and produce a living calf. Although management may provide some protection from the elements, as well as a good supply of food, cattle on the ranch need as large of a tool chest as possible to accomplish their desired outcome, which is to survive, reproduce and produce beef.

Just the other day, temperatures dropped 50 degrees when we went from slightly above thawing to almost minus 20. However, the cows survived. In fact, they actually handle these massive changes better than the producer. Why?

Well, we are now back to the discussion of DNA. As DNA is passed around from one generation to the next, the process is semiconservative. Just as ranchers are conservative and try to minimize risk, the genetic process also minimizes risk and assures us that the next generation will be equipped with all the tools that are needed.

How does this happen? Every time a cell divides and the chromosomes replicate, they are copied as one long strand of DNA. Because all chromosomes (the home of DNA) are doubled, every calf gets one whole strand from each chromosome through the reproductive process.

This may seem minor but, in reality, this assures that every calf cell always will get one copy of a single strand from the cow and a single strand from the bull for each chromosome. This semiconservative nature of DNA is the basis of our inheritance and leads to the independent assortment of our genetic material and random segregation of genes as they are passed on from one generation to the next.

As producers, we may not understand the whole process, but rest assured that the process keeps the toolbox full. Seems heavy, but cattle will survive despite our efforts and always will be adapting to a changing world, which is good.

I was reviewing some information on DNA when the term "apoptosis" was displayed on my computer screen. The word apoptosis probably does not come up during a typical coffee shop talk. Apoptosis is the process in which individual cells are programmed genetically through their DNA to be eliminated when their purpose is done.

The point is that, as we enhance our efforts at understanding DNA in cattle, DNA always will amaze us on the detail in which every microsecond of life depends. Those details are put in place upon conception and continue, as amazing as it seems, even after death. This seems strange, but dead cells have living functions through apoptosis, which is the process of cell death to allow room for the next generation of living cells.

Life is complicated.

May you find all your ear tags.

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