

Genetic Train Includes 60 Chromosomes in Each Cell Working to Make Beef

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Cattle breeding is relatively simple and will occur in the natural state without people. However, the bull or cow has no natural mechanism to cross fences and roads, so in the present, cattle at least need people to open the gates.

The purpose of placing the bull with the cow is to conceive a calf. This calf should be half the bull and half the cow. In theory, because of the calf's early uterine residence with the cow, the cow actually has a little more say than the bull, but practically speaking, the calf is still a 50/50 deal.

Beef cattle producers desire to construct, or at least guide, the genetic makeup of the calf. Fundamental to all genetics is the concept that the genetic material contained within each cell controls and dictates the characteristics of the end product.

Through individual cells, the genetic material defines all stages, including work efforts and subsequent reproduction of each cell. Each cell has a set of chromosomes, and contained within those chromosomes is the transcript, the master plan. A beef producer's job is to focus on what is actually loaded at the chromosome level. If the trait you are looking for never got loaded, there is no use in asking for it.

If you buy a bull, you need to know what's loaded. For example, if the gene for horns wasn't loaded, your calves will not have horns. A simple trait to work with, those cattle with no horn genes loaded are often sold as naturally polled. If you were to envision a chromosome, you could envision it as a train. This train has many cars, several engines and even a caboose or two.

The cars on the train could be passenger cars, box cars, hopper bottom cars, etc. Each box car could be responsible for delivering different products, or one type of box car could be repeated several times to deliver lots of a particular product. Are you making the connection? Chromosome equals train.

Long strands of DNA material are connected in the chromosome, while long strands of cars are connected in the train. For now, let's only work with one train or one

chromosome. If the calf is to have horns, one of those box cars has to carry everything it takes to make horns. In contrast, the box car may be empty, the absence of horns. So if the box car is empty, or the chromosome has the strand of DNA signifying polled, the cattle are polled.

Have you ever been to a train station? This train station handles many trains coming together and departing.

In terms of beef cattle and trains, every cell in every normal cow, bull or calf has 60 chromosomes. Within that cell is a train station that controls all sixty trains (chromosomes) running at once. Each chromosome is responsible for something, and if derailed, so ends life. However, not all chromosomes are functional in every cell, i.e., a skin cell has different trains running than a liver cell. The liver cell will only run the trains (chromosomes) it needs, but both cells have the same set of trains made up of many, many cars.

This discussion will continue, but for now imagine every cow you own is composed of cells, all controlled by a complex set of chromosomes, running very smoothly. As the beef cattle producer about to select a new bull to place with your cows, the quest for the right train and cars is important. Your cows are loaded with the best set of trains you have found--box car, after box car of great performance.

You certainly want to find the right complement to those cars. The big question remains: how do you find the right bull?

Well, let's get ready to load the trains. More next time. May you find all your ear tags.

Your comments are always welcome at www.BeefTalk.com. For more information, contact the North Dakota Beef Cattle Improvement Association, 1133 State Avenue, Dickinson, ND 58601 or go to www.CHAPS2000.com on the Internet. In correspondence about this column, refer to BT0129.

Chromosome Train

