CANADIAN LUING
Cattle Association

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MESSAGE FROM THE PRESIDENT ***Jeff Longard***

Beef, Banana Leaves and Breeding

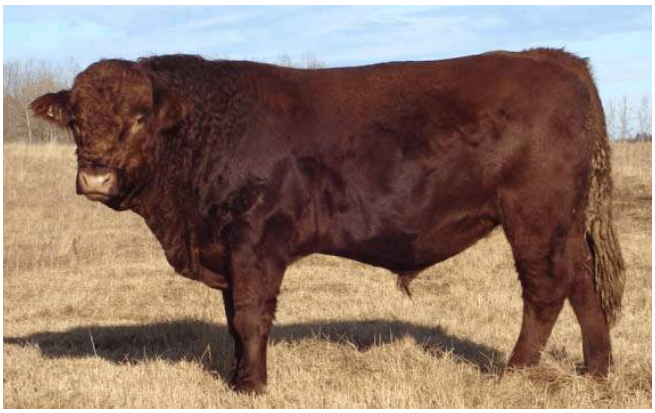
This summer, I spent a month in western France. It was a trip unconnected with cattle, but you may imagine that I kept my eyes open. I was amazed at the equable, extremely temperate climate. Olive trees, fig trees, palms grew in abundance. I even saw several banana trees which managed quite nicely out of doors the year round. Temperatures under 0˚C are rare and seldom lasted more than a couple of days.

I saw cattle, and it took a while for the significance of that sight to sink in. I saw Limousin, Blonde d'Aquitaine, Charolais, various Simmentals. *I was seeing them in their native environment, in the climate for which they were bred and selected over countless generations.* And "tout à coup," as the French would say, a light went on. Taking these breeds from their natural home and expecting them to thrive without massive supports in the relatively brutal climate of Canada's ranch country is like putting tropical fish in dry straw in your barn and figuring they'll live and breed successfully.

Don't get me wrong. There is a place for these breeds in Canada – or rather, there is a time. It's called "summertime." An exotic terminal bull of the right type may be an economical addition to some operations. But I saw first hand what sort of eyes-tight-shut optimism is required to remove animals from the "banana belt" and make them the foundation, even in crossbred form, of the year-round maternal herd. If the price of inputs is the voracious devil that eats the cattleman's profits, why would we choose animals that guarantee the fullest dependence on diesel-hungry agriculture and grain?

The answer, I thought several years ago, was to get into "moderate framed, maternal cattle." I don't need to name the breed, but they're red or black. (Which says nothing nowadays, since practically all breeds are now red or black. Hmmm..) But I found that selecting for smaller, more effecient body types didn't result in a smaller herd overall. Large size and slab-sided inefficient grain augers kept popping up in every generation. I was to learn that what you see is not what you get.

Unless cattle have been linebred, that is. Line-breeding is the means by which genetic uniformity is achieved, so that genotype – the animal's potential to reproduce itself accurately – is closely tied to phenotype – how the animal itself



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looks and performs. Line-breeding requires a certain level of knowledge, forethought, and careful observation, which is why it is extremely rare today, since almost all breeders find it simpler to feed numbers into a computer and magically receive the results they're looking for. That's called EPDs. And incidentally, that is why almost all cattle of any breed can be had in red or black and why virtually all of them are monstrous feedlot hogs.

Luing Secretary Iain Aitken's article in this issue explains line-breeding, and it is so important that all I really want to do here is to encourage you to read what he says and reflect seriously on it. ▣

MESSAGE FROM THE SECRETARY ***Iain Aitken***

The Case for Line-breeding

Since moving to Canada I've had to think a lot more about the genetics of the Luing cattle we have than was the case in Scotland. Without the number of genetically different herds to select breeding stock from, I have come to appreciate the genetic balancing act Dr. Church has been performing for the last twenty years, maintaining almost a one-herd breed with several different bloodlines. After studying the genetics of the cattle available in Canada, my future plan will see our herd heading down a path less traveled – that of line-breeding.

It seems many cattle breeders stake their genetic futures on going to an auction sale and buying an attractive looking bull that is unrelated to their current herd. Usually the tendency is to select a bull that looks to be physically strong in a trait that his predecessor was lacking in. This is not how it always was, though – from the time distinct breeds were formed and became recognizable until the middle of the twentieth century, much more use was made of line-breeding. Since then the use of "outcross genetics" has become the fashion of cattle breeding. The problem with this trend is that it has pedigree breeders marketing hybrid vigor instead of genetic prepotency. Hybrid vigor certainly has its place in the beef industry, but because of the heterosis it introduces it should be at the cross-breeding end of the business rather than in purebred herds.

What is line-breeding?

Line-breeding has a long and proven history as it was used in the creation of all domesticated breeds of animals. Indeed, it is only through line-breeding that a breed type can be fixed that allows pioneers to establish new breeds. Line-breeding was used by Robert Bakewell (the famous English Leicester sheep and Longhorn cattle breeder) in the mid 1700s, but the practice certainly pre-dates that.

Line-breeding is the purification of bloodlines by breeding genetically superior animals together in closer relationships than would normally be used. This forces any genetic faults they have to be expressed and thus to be culled from the herd. It also increases the genetic influence of an exceptional animal, resulting in faster and also more lasting improvement of the herd. The result, if done properly, is a uniform herd of cattle which reproduce all the desired traits in a predictable manner. This uniformity of type is not merely a visual similarity; it is also a genetic uniformity. More pairs of alleles that make up each gene on the DNA strands are likely to be identical in line-bred cattle than is the case in unrelated cattle. This results in the cattle being homozygous in more traits, which makes them pre-potent and able to stamp their type on their offspring.

LLR 50T

Although there are many opinions on the difference between line-breeding and inbreeding, I put a lot of faith in the version outlined by Jim Lents (an American horned Hereford breeder) in his definitive book *The Basis of Line-Breeding*. The fundamental rule that Lents outlines is that as long as the genetic contribution any individual ancestor

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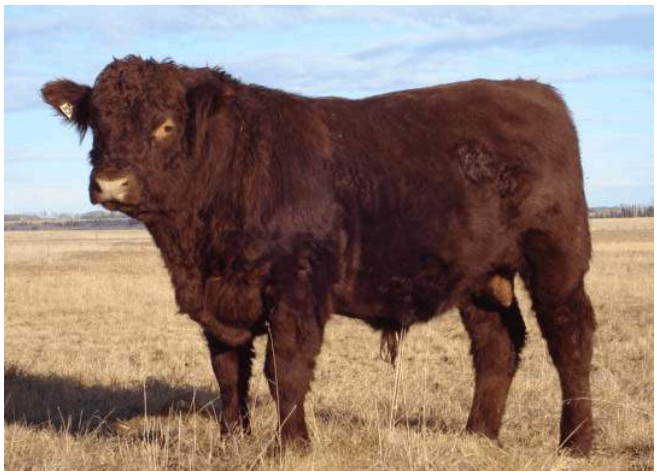
makes to any offspring does not exceed 50% it is line-breeding - not inbreeding. An example of line-breeding would be the half brother/half sister matings which are often used to procure the foundation stock of a line-breeding program. On the other hand using a sire back on his daughter is clearly an example of inbreeding as there is a 75% contribution of the sire's blood in the resulting calf. I was interested to read in Scottish Luing history that the breed was created "*by inbreeding followed up by line-breeding*." Using Lent's definition, however, there was clearly no in-breeding as the first generation (foundation Shorthorn sire Cruggleton Alastair's sons and daughters) were mated to each other in the classic half brother/half sister foundational cross of a line breeding plan.

The most compelling proof of the potential of line-breeding I have found is in Lent's Anxiety 4th Hereford herd based in Oklahoma. This has been a closed, line-bred herd for nearly 130 years despite now being owned by the second generation of the third different family of breeders! An outstanding bull named Anxiety 4th was purchased in England in 1881 by breeders Gudgell and Simpson of Independence, Missouri and this laid the foundations of a remarkable cattle line. The quality of cattle resulting propelled the Hereford breed from a poor third place to the number one breed in the United States. In the first 100 years on American soil the Hereford breed registered over 18 million cattle and it is reckoned that 99% of modern American Herefords are descended from Anxiety 4th through the sire line. In recent years the fashion for black cattle in the USA has seen the Angus breed take over the number one spot but the demand for line-bred Lents Herefords is still excellent, particularly among producers seeking to grow and fatten their cattle on grass rather than in the feedlot.

The long term success of any breeding program depends on correct selection of replacement stock and this is even more important in line-breeding than in conventional breeding. The culling rate required, particularly in the early years, can be heavy depending on the quality of the foundation stock. On the other hand one of the advantages of line-breeding is that once you have achieved your "perfect" animal it is possible to maintain that animal's bloodlines almost in a state of equilibrium for perpetuity. A line-bred herd can be built around one or more outstanding animals whose type is your ideal. Most often herds are built around outstanding bull lines, simply because they can breed more calves in a lifetime than a cow can, particularly using artificial insemination. In our case, however, we are building our herd around an outstanding cow - Lochend Luing 223U. This Luing Bonus sired cow is rearing a good heifer calf at the age of 22 years, There are not many cows that make it all the way through the alphabet but this "U" cow is rearing a "U" calf – the next time around! She has only missed calving once and that was at the age of 20 but even that wasn't a wasted year as we flushed 18 embryos out of her before breeding her back. This cow is as sound as most eight year olds, easy fleshed, good udder, perfect feet – and obviously



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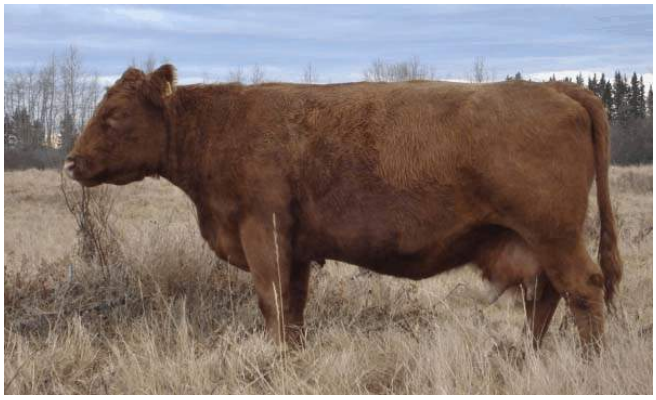
fertile! I would have preferred her red rather than yellow but other than that she is my perfect cow.



LLR 223U at age 22!

I realize now that the limited Luing gene pool in Canada is not the problem I envisaged initially but rather an advantage. When we planned an embryo transfer mating for this cow we were able to use semen off a bull who was not only a half brother through their shared sire, but in fact was a three quarter brother as the dams of both animals in turn shared a sire. This genetic closeness combined with embryo transfer technology has bought us a few years head start as making progress in cattle breeding is otherwise a painfully slow business. We now have sons and daughters off this old cow by two different bulls and by breeding sons off one bull to daughters off the other and vise versa the matings will all be of the half brother/half sister variety and thus all offspring will effectively carry 50% of 223Us blood. In the years ahead, with subsequent generations, we intend to continue mating the offspring of these two sets of relatives to each other, but never to a degree that would result in in-breeding. How successful we will be in the long term remains to be seen, but I am certainly encouraged by the quality and uniformity of the embryo calves we have on the ground this year.

The extended pedigree below shows a mating we will perform in the future with the calves we have now (the U year letters shown in the second generation.) In addition to having the shared 223U cow bloodlines the animals also have closely related sire bloodlines. Solomon is a son of Bear, who is a son of Rothney Grand who in turn is a Grandson of Snowander 185Y.

			Snowlander 185Y
		MRR Ulyssis	
			LLR 223U
	MRR bull		
			Rothney Grand
		MMR 33U	
			LLR 223U
MMR Line-bred offspring			
			MMR Bear
		MMR Solomon	
			LLR 223U
	MMR heifer		
			Snowlander 185Y
		MMR 5U	
			LLR 223U

Central Station will develop Luing Bulls on Forage

After a trial run last winter, the Association is proceeding with a more formal group rearing/testing program for developing breeder's bulls. The young bulls will be reared as a group under identical conditions at Blacketlees Farm, Rimbey. This will allow customers to view and compare bulls at one central location knowing that the bulls have all been raised on the same rations. The aim will be to develop bulls to sell at 20-24 months of age although the occasional, larger bull may be sold as a yearling to meet customer requirements. The bulls will be developed on an all-forage diet using hay/silage in winter and intensively managed pasture in summer. We are growing them out slowly on forage for two reasons - to maximise longevity on the bulls and to identify those that perform best under a foraging system. Most ranchers maintain their cowherds on all-forage rations, so logically the bulls that will breed the type of replacements they want should also be proven under a foraging system rather than the grain-based feedlot program most bulls are reared on. Twelve weaned bull calves from four different herds are entering the program this fall.

GWL 50T

LUING CATTLE FOR SALE

BULLS FOR SALE:

From Greywood Luings: 1 horned bull (GWL 50T, photo above) born June 2007
1 polled bull (GWL 47T, photo p. 3) born May 2007
From Lochend Luing Ranch: 1 polled bull (LLR 50T, photo p. 2) born May 2007
From Medicine River Luings: 1 polled bull (w/scurs; MRR 25T, photo p. 3) born May 2007
1 polled bull (MRR 28T, photo p. 1) born May 2007

All of these bulls have been raised on our forage test at Blacketlees Farm, Rimbey, Alberta. They are available for inspection and sale beginning December 1, 2008 on a first come first served basis. Contact Iain Aitken at (403) 843-0094.

GWL 47T

MRR 28T

LLR 50T

MRR 25T

GWL 50T

FEMALES FOR SALE:

From Lochend Luing Ranch: A selection of the 2008 heifer calf crop is available for sale. Contact Bob Church at (403) 208-3747.

the Canadian Luing Cattle Association

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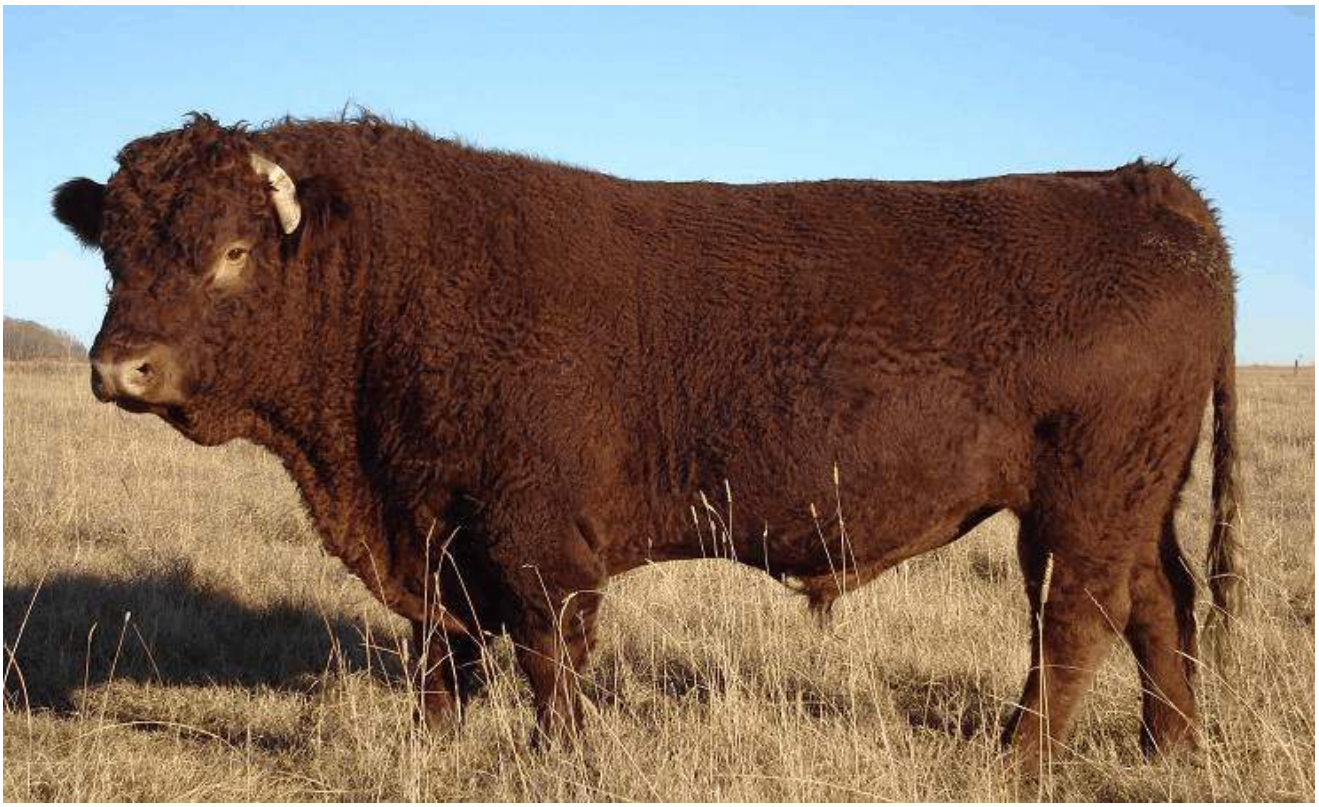

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