

The Importance of Correct Genetic Selection in High Quality Grass Fed Beef Production

by: John O'brien – Sustainable Genetics LLC

The theories behind today's modern farming practices – and those who promote them – would suggest we are making great progress. The fact that - in all aspects - we maybe taking one step forward and two backwards never seems to be considered.

A very large industry has developed around the supply of aids for our modern farming practices. What never seems to be considered is the fact that the continual list of 'solutions' offered by these companies are usually required to fix problems created by their last revolutionary farming break through. This fact never seems to be considered by the consumers or acknowledged by the suppliers of these products.

Selling solutions which create tomorrow's problems – which will require the next wave of solutions - is a great basis for a sustainable business. This situation is also occurring in our beef and dairy genetic supplies. I believe these products are not conducive to sustainable farming for the end user.

The genetic design of our beef and dairy cattle has also suffered a similar fate as our farming methods. Production based selection has caused our milk products to lose components. This selection criteria - combined with incorrect phenotype identification - has wrecked the commercial economic functionality of the Holstein breed.

Our modern beef cattle– if fed to a required level – have greater potential for weight gain, however, the resultant quality and cost of this product is questionable.

Research in the US validates that - whilst our modern beef cattle claim greater eye muscle areas (EMAs) - the actual **% of EMA to carcass weight** is decreasing – **resulting in lower value based carcasses**. Marbling in the Angus breed has receded in this country.

Any totally grass based production system will have fluctuating nutritional levels. Genetics which have been selected for years to function in feed lot or heavily supplemented environments (which most seed stock operations provide) will/can not function profitably in grass based production systems.

Growers attempting to sustainably produce high quality grass fed beef using genetics produced in our modern seed stock environments are really attempting to perform the impossible. The case is similar in dairy production as well. A commercial producer must define the environment they can afford to create and be very careful **not** to introduce genetics which have evolved in a nutritional environment superior to theirs.

Unfortunately, there appears to be a world wide problem of commercial producers selecting genetics which evolve in environments they - economically - cannot afford to provide. The conflict between promotable (seed stock) and profitable (commercial) is the problem. World wide, the seed stock industry is supplying the commercial industry with non commercial genetics. This is a serious threat to the economic sustainability of all bovine production systems.

In any grass based production system the resultant meat quality is heavily related to how an animal responds when nutritional fluctuations occur. Our modern cattle struggle greatly in this area because they carry the incorrect phenotype.

An animal which copes well with negative changes in nutrition levels - without having to 'rape & pillage' its own fat and protein reserves in an attempt to survive - is an animal which has the ability to produce high quality beef in a grass based production system. This is a function of correct phenotype.

The phenotype of an animal dictates how economically it will function in its environment and the value based yield of the carcass. Modern computer generated breeding values ignore correct phenotype identification. Our modern bovine strains are too tall and too narrow to be economically productive.

World wide research leads me to conclude that sustainable production of a high quality - totally grass fed beef product - requires genes which possess the following properties:

1. The ability to thrive when nutrition levels are high and maintain themselves when nutrition levels are less than ideal
2. Females which produce acceptable calves and rebreed in a restricted breeding period
3. An ability to handle stressful nutritional situations with minimal or no supplementation
4. The phenotype of the population will be moderate framed and naturally thick
5. The breed will be of British origin

Point 4 supports points 1,2 & 3 and ensures the carcasses will be well finished at an early age, of high quality and **carry high percentages of EMA/CWT.**

This is not purely about red meat yield; it is about higher percentages of high quality, high value cuts.

This ensures a profitable product for the processor/ retailer and a high quality eating product for the end consumer. So premiums are available and affordable. The discerning consumer requires high quality beef not cheap red meat.

Hence the chain is complete with all parties being well satisfied. Correct genetic selection is the key. This has nothing to do with today's computer generated breeding values which accompany fashionable genetics.

In the main, our modern seed stock industry considers genetics which will satisfy the above requirements too small, old fashioned or backwards.

My search for genetics with the aforementioned criteria led me to a group of Angus breeders(Waigroup) which the mainstream industry considers too small and out of date. This was encouraging. For 40 years this operation has been rigidly adhering to a designed breeding program of high stocking rates, low inputs, tight calving patterns and within herd genetic selection. Grain has never been fed. Hay is rarely fed. Much line breeding has occurred in this breeding program.

Being deemed as unfashionable by the industry forced this operation to be run under strict commercial conditions to ensure sustainability and profitability. What a great environment for a seed stock herd - which will supply the commercial industry - to evolve in.

Continual, relentless selection of survival of the fittest - under high stocking rates with no quarter given - has – through natural selection - created a herd of seed stock animals with exceptional commercial functionality; which have a tremendous ability to perform to their projections under all nutritional conditions. Modern genetics could/would/will not survive these selection criteria.

Modern seed stock producers are continually improving their nutritional environments in an attempt to afford modern genes the environment they require to function – and still they struggle. Not to mention when they are moved to a commercial environment.

After inspecting these herds and their breeding program I then performed extensive research on the group's live carcass ultrasound scan data and verified that the **actual** marbling and EMA/LWT raw scan values - of this strain of Angus - are much **higher** than the Angus breed average. The computer generated breeding values these animals carry for these traits are much **lower** than Angus breed average.

Further verification of the flaws in our modern livestock evaluation systems.

The final proof of the value of these genetics was demonstrated at The 2004 New Zealand the Steak of Origin Competition. This is a very extensive competition which takes all aspects of meat quality into account right down to eating quality. A summary follows:

In May 2004 more than 100 entries competed in the 2nd New Zealand Steak of Origin Competition. There were 5 classes:

1. Best of British Breed
2. Best of European Breed
3. Best of Other Breed
4. Best of Brand
5. Overall Grand Champion

All entries were sent to Lincoln University to select the top 4 finalists in each of the entry classes. The Lincoln judging criteria is based on Tenderness, Marbling, PH and Moisture loss in cooking.

The finalists in each group were submitted to a taste test by the public and a panel of food experts.



NZ Beef and Lamb Marketing Bureau Steak of Origin 2004 winning entry

An entrant from the Glanworth (group member) herd was judged the Best of British and Overall Grand Champion entrant. This heifer was 18 months old and had only ever been pasture fed.

One of the judges – Television Chef – Allyson Gofton - who headed the panel of expert judges - said of the winning Glanworth entry ‘That steak had an intense beef flavor..... I thought, “Wow I’d like to eat steak like this all the time”.’

Measurements done by Lincoln University for the competition on winning entry

Tenderness (kg Force)	% Marbling	pH	% Cooking weight loss
3.3	6.39	5.53	23

The competition has again been recently conducted. Hotly contested with over 200 entries competing. Again the Glanworth herd won the overall Steak of Origin.

This herd has only entered the competition twice and won twice.

‘The proof is in the eating!’