

## GET TO KNOW YOUR BREED. SIMMENTAL PERFORMANCE

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Increasingly, seedstock breeders are being called upon to provide clients with technical advice. One of the areas where commercial producers have greatest difficulty is with crossbreeding programs. All too often, they end up breeding something which has no chance of meeting the needs of the marketplace.

With a little help from their friendly bull supplier, they could breed calves which are highly sought after for a range of different markets. As a result, they will be more profitable; their cattle businesses will expand; they will need more bulls and a bit more help, and then your businesses will grow. Remember, it is much easier to sell anything (bulls included) to a repeat customer. However, if you don't look after them first time around, they may never come back. Worse still, if they have a really bad experience with one bull, they may think every bull in the breed is the same. Then the breed suffers.

Really good client service involves having an excellent technical knowledge of the breed. I have summarised research findings from the USDAs Meat Animal Research Centre (MARC) in Nebraska as well as some wonderful Grafton Agricultural Research Centre (GARC) research which will help equip you technically, for the seedstock producer role.

### GARC RESULTS

#### Benchtest: Pure Hereford vs Simmental x Hereford Progeny Performance

The breed evaluation research carried out at GARC reveals some very attractive advantages of Simmental x Hereford (SxH) F1 calves when compared to pure Hereford calves. The results are based on using a large number of sires from both breeds over randomly assorted pure Hereford cows. The results are summarised below.

Birthweight	Simmental sires had heavier calves at birth, with the biggest difference for male calves which were 2.1kg heavier.
Gestation Length	Simmental sired calves had longer gestation lengths (286.5 days) than Herefords (283.5 days).
Weaning Weights	At 200 days SxH calves weighed an average of 176kg while HxH calves weighed only 161kg - a 15kg or 9.4% advantage to the Simmental.
Post-weaning Gain	SxH calves grew 16% faster on 4 inland locations and 15% faster on coastal locations, than HxH calves.
Dressing %'s	There were no differences in dressing percentages. The SxH muscle was probably offset by being leaner. Dressing percentages go up as muscle increases.
Eye Muscle Areas	SxH steers had EMAs which were 10sqcm bigger on inland rear carcasses and 8 sqcm larger for coastal carcasses. Simmental sired calves were heavier than pure Herefords resulting in higher carcass yields.
Fat Depth	SxH steers were leaner at all carcass weights. The differences were 2mm (12/13th rib) at 200kg carcass weights and increased to 5mm at 300kg. A linear relationship was evident.

#### Benchtest: Simmental x Hereford versus Pure Hereford Female Performance

As a European breed, Simmental have one outstanding feature - they have excellent maternal qualities and are suitable for retention as replacement heifers when crossed with Herefords or other British bred cattle.

Other Euro breeds such as Limousin and Charolais are best suited to the role of terminal sires, where all progeny are sold.

Remember, the real hybrid vigour advantages are only fully exploited when the F1 females are retained as breeders. This is because much of the hybrid vigour benefits are expressed in fertility and calf survival.

Once again the GARC research is summarised below. The results are based on SxH and HxH cows which have been joined back to Hereford sires. The cows were run under high, medium and low levels of nutrition.

Birthweights	SxH cows had calves which were on average 2-4kg heavier than HxH cows, depending on the level of nutrition.
Calving Problems	SxH heifers had less calving difficulties than HxH heifers (10% vs 15% calving problems).
Calf Survival	95% of SxH calves survived to weaning whereas only 87% of HxH calves survived to weaning.
Weaning Weights	SxH cows reared calves which were 29-47kg heavier than HxH cows, depending on nutrition.
Calf Growth Rates	Calves from SxH cows grew 23%, 20% and 36% faster than HxH cows on high, medium and low planes of nutrition respectively.
Calf, Cow Wt Ratios	SxH cows reared heavier calves (to 200 days of age) as a percentage of their own liveweight than HxH cows. The calf to cow ratios were 51% vs 47% for medium and 46% vs 37% for low nutrition.
Maturity	SxH cows were taller and leaner than HxH cows. However, HxH cows were heavier, which means the Hereford cows were fatter and heavier when going into droughts and tough seasons. This is a very important difference - in droughts SxH cows must be fed earlier to prevent rebreeding rates. It is best not to run them in the same paddock for this reason.
Feed Efficiency	GARC measured feed intake and despite eating more SxH cows were more efficient. Most of the extra intake was due to their superior maintenance requirements. This intake meant you could run only 90 SxH cows on the same amount of feed as 100 HxH cows, but even after this adjustment for feed intake, SxH cows were still to be more efficient.
Profitability	SxH cows made higher profits on high and medium levels of nutrition after adjusting stocking rates for feed intake differences. However, they were not able to achieve higher profit levels on low nutrition. An important point to remember when giving advice to commercial breeders is that SxH cows are more profitable than HxH cows on high and medium levels of nutrition.

### MARC RESULTS

The MARC research is probably the most respected work of its type in the world. They have studied the performance of different breeds for many years and are great advocates of crossbreeding.

*"Why spend a lifetime trying to improve a trait within a breed, when you can fix it in one generation by using a different breed?"*

This is the argument Simmental breeders must use when discussing crossbreeding programs with your clients. Before you can give them really good advice, you have to have an intimate knowledge of what Simmentals are good at, and just as importantly, what they are not good at.

Remember, you don't want your clients to make bad decisions, because they will lose money. It is the profitable cattle breeders, that return to buy the high priced bulls.

A summary of how different breeds perform in the different traits follows.

## Low Ages Of Puberty Mean Higher Profits

Puberty is the age at which heifers cycle and are capable of conception. For bulls, it is the age when they produce viable sperm.

The age of puberty is influenced by nutrition - earlier with high nutrition, but late with poor nutrition. There are genetic factors which are important as well, as evidenced by very large differences between breeds.

Few cattle producers realise that the correlation between age of puberty and scrotal size is extremely high. In fact, it is 0.9 or 90%, which means that they are almost, but not quite, the same trait!

Please study the table on the next page and notice how the breed with the largest testicle size (Simmental) also has the lowest age of puberty.

This relationship also holds true for Limousin which have small testicles and are very late to sexually mature.

BREED	Puberty - % at 410 days	Adjusted age of Puberty (days)	Scrotal Size (cm)
HEREFORD	39.9	411	30.3
ANGUS	57.4	393	32.1
LIMOUSIN	44.0	408	29.0
CHAROLAIS	60.6	391	32.2
SIMMENTAL	86.8	363	33.7

Data: MARC

The reason that MARC chose 410 days of age, is because this is when most cattle producers are likely to join their heifers (i.e. 12 - 15 months of age). A low age of puberty is critical in restricted joining periods (eg. 6-9 weeks), because maximum profitability is achieved by getting 60%+ calves born in the first 21 days of the calving season, to maximise weaning weights (the calves are older, therefore heavier). To do this, they must conceive in the first 21 days of the joining season - and to do this they must be cycling! So you can see that Simmental have an advantage in this respect.

Simmental have some of the largest testicles of any breed. This is good news! It is a trait which has quite high heritability (i.e.42%). This makes Simmental bulls ideally suited for use at yearling (12-15 months) age. Now this is really good news, because it means that breeders of Simmental bulls, can sell them with confidence a year earlier than usual. This improves the cash flow of your business and lowers the cost of producing bulls. In the US, it is estimated that 80% of all bulls are used at yearling age.

## More Calves & Heavier Calves Means Higher Profits

The driving force behind cattle profitability is the number of kilograms of weaned beef produced per cow joined.

This is a bit of a mouthful, but it is important, so read it again. Achieving top results means you have to achieve:

- high conception rates
- low levels of calving assistance

- high calf survival rates
- high weaning percentages
- high weaning weights

If you study the table below carefully, you will notice that Simmental heifers joined to calve at two years of age perform very well. Their biggest problem occurs at calving, but this will be discussed later on.

Table: Breed Group means for Reproductive Performance

BREED	PREGNANCY (%)	CALVES BORN (%)	CALVES WEANED (%)	200D WT/ cow joined (kg)	Ave 200 day weight (kg)
HEREFORD	64.1	62.3	46.8	81	172
ANGUS	77.9	75.4	61.8	113	183
LIMOUSIN	54.7	53.0	41.8	82	194
CHAROLAIS	72.3	67.2	56.2	122	217
SIMMENTAL	82.4	81.2	66.0	150	226

### Simmental Growth is Explosive - But Watch Maturity

The growth of Simmental to yearling age is explosive! It is the thing that Simmentals are really good at. They are "fast out of the blocks"! This growth is well known to Simmental breeders; it is also well documented by research, but strangely many Angus , Hereford and Shorthorn breeders are not aware of just how fast they can grow.

The table below shows that Simmental and Charolais are "neck and neck" for growth, but that Simmentals are taller and leaner which can be a problem when it comes to finishing calves.

In general, the taller an animal is, the harder they are to fatten. Simmental breeders need to breed cattle that are capable of fattening easily to meet specifications for a range of different markets. Cows which are a little fatter or "softer" also survive tough seasons and droughts better.

Table: Breed Group Means for Calves at Yearling Age

BREED	Liveweight (kg)	Height (cm)	Condition Score (1-9)	Muscling Score (males only)
HEREFORD	324	116	5.7	4.6
ANGUS	328	117	5.6	5.1
LIMOUSIN	344	123	3.6	6.9
CHAROLAIS	394	128	4.7	5.9
SIMMENTAL	391	128	4.7	5.9

Data: MARC

A similar pattern is apparent with cows. Simmentals tend to be taller, leaner and heavier than the other

breeds, with the exception of Charolais. Seedstock breeders need to address this very important issue. If Simmental are already one of the biggest breeds in the world, do we need to make them any bigger? In fact, there are some good arguments for making them a little smaller, especially under tough Australian conditions.

It is very noticeable that Simmental cows which have been bred in Australia under restricted joining seasons (i.e. run under strict commercial conditions) are very moderate in size. The breeders of these cattle will tell you that the big ones "can't hack it". In other words, they don't go back in calf, so they get culled. The breeders who cull the empty cows are in tune and listening to what nature is telling them. These people don't make excuses for their cattle, and nor should they.

Table: Breed group Means - Cows 2-7 years of age

Breed	Liveweight (kg)	Height (cm)	Condition Score (1-9)
HEREFORD	522	127	6.5
ANGUS	508	126	6.0
LIMOUSIN	534	133	4.4
CHAROLAIS	615	137	5.5
SIMMENTAL	573	138	5.3

### Keep Cow Maintenance Costs Low

When cattle eat grass in our paddocks, they use it for two purposes:

- to sustain life (i.e. maintenance)
- for production (i.e. growth, pregnancy, lactation)

The energy available to cattle for metabolism is referred to as metabolisable energy (ME) which is measured in joules per kilogram of dry feed (dry matter or DM). For example, straw has an ME of about 5 mj/kg DM, whereas oats has an ME of around 11 mj/kg DM.

Maintenance costs in a breeding herd are critical for obvious reasons. Trangie Research Centre have shown that 75-80% of all feed consumed by a self-replacing breeding herd is used for maintenance,

Simmentals, because of their fast growth, high milk production and large mature size have high maintenance requirements. This is evident in the MARC data presented on the next page.

Tables: Estimates for Metabolisable Energy (ME) required for Maintenance, Growth & Lactation of Various Breeds & Crosses

	Biological Type Classification		Maintenance Requirements (kj/kg adjusted for mature weight)	RATIO %
	Growth Rate & Mature Size	Milk Production		
<b>1. GROWTH</b>				
HEREFORD	moderate	low	444	91
SIMMENTAL	high	high	527	108

	Biological Type Classification		Maintenance Requirements (kj/kg adjusted for mature weight)	RATIO %
	Growth Rate & Mature Size	Milk Production		
<b>2a. MAINTENANCE</b> Dry, empty p/bred cows 5-6 years				
ANGUS	moderate	moderate	494	95
HEREFORD	moderate	low	502	97
SIMMENTAL	high	high	561	108

	Biological Type Classification		Maintenance Requirements (kj/kg adjusted for mature weight)	RATIO %
	Growth Rate & Mature Size	Milk Production		
<b>2b. MAINTENANCE</b> Dry, empty cross bred cows 9-10 years				
ANGUS x HEREFORD	moderate	moderate	544	92
HEREFORD x (AxH)	high	low	540	91
SIMMENTAL x (AxH)	high	high	669	113

	Biological Type Classification		Maintenance Requirements (kj/kg adjusted for mature weight)	RATIO %
	Growth Rate & Mature Size	Milk Production		
<b>3. LACTATING</b> Empty cows 5-6 years				
ANGUS	moderate	moderate	623	96
HEREFORD	moderate	low	590	91
SIMMENTAL	high	high	695	107
CHAROLAIS	high	low	690	106

As you can see from the tables, Simmentals have higher maintenance requirements, which is hardly surprising since big cows, like big cars, are more expensive to run.

The higher maintenance costs of Simmentals are not a problem in high rainfall areas where there is plenty of feed all year round. They may also have an advantage in spring, when a lot of

The higher maintenance costs of Simmentals are not a problem in high rainfall areas where there is plenty of feed all year round. They may also have an advantage in spring, where a lot of feed gets wasted. However, you must caution your clients that Simmental genetics have limitations on poor quality feed and at times when feed is scarce. After all, you don't get growth out of 'thin air'.

Big Calves Cause Big Problems & Lower Profits

Calving problems are a significant source of economic loss to Australian cattle breeders, particularly in the

temperate areas. Strangely, many seedstock breeders try to sweep the problem under a mat, despite the fact that their commercial clients might be hurting badly.

The labour costs of supervising cows and heifers at calving are both high and unnecessary.

Herds which require no supervision are more profitable. Their owners are also less stressed out.

Heifers which require assistance at calving have:

- higher rates of retained afterbirths & infections
- calves which are more likely to die
- lower conception rates when rejoined
- calves which don't grow as well

Table: Breed Group Means for Mixed Sec Calves and Cows at Calving

BREED	CALF BIRTHWEIGHT (kg)	PELVIC AREA AT 368 DAYS (sqcm)	CALVING DIFFICULTY (%)
HEREFORD	34.2	123	48.6
ANGUS	32.5	124	40.9
LIMOUSIN	35.7	138	29.1
CHAROLAIS	39.7	158	39.0
SIMMENTAL	39.2	150	52.0

Data: MARC

As you can see, Simmentals did not perform well. this is due to high birthweight relative to pelvic area. The better Simmental breeders in Australia are addressing this problem by recording birthweights and measuring pelvic areas and submitting the data to the Simmental office for Breedplan analysis. Selection for lower birthweight and high calving ease (there are EBV's for both !) will significantly reduce calving problems caused by Simmental bulls, especially when joined to British bred cows (which is why they are here !).

The Simmental office has technotes on improving calving ease by selection, which are available free of charge. It is really important that Simmental seedstock breeders read this, so that they understand how to correct one of the breed's deficiencies.

## Meat Quality

Marbling has become the flavour of the month! Marbling does improve the flavour and tenderness of beef, but it's impact is not as large as most people think. The improvement is around 5 - 15%.

In the US and Japan, marbling is used in their meat grading schemes. The US Choice grade referred to in the table below, is the most popular restaurant quality beef and it is quite highly marbled.

Taste panels are used to record the eating quality of meat. They are trained "beef eaters" who score the beef on tenderness, flavour and juiciness.

Another way of measuring tenderness, which is objective, is to use a machine which tears the meat apart. Called the Warner-Bratzler (W-B) shear force measurement, it records the force needed to tear the meat.

High values mean tough meat.

The breeds in the Table below were randomly joined to Hereford x Angus cows and the measurements were all made on the progeny of these crosses.

Table: Meat Quality Trait Assessments of Different Breeds

BREED	Marbling Score	USDA Choice (%)	W-B Shear (lbs)	Panel Score Sensory Tenderness	Panel Score Flavour	Panel Score Juiciness
Limousin X	9.0	37	7.7	6.9	7.4	7.3
Brahman X	9.3	40	8.4	6.5	7.2	6.9
Glebvieh X	9.6	43	7.8	6.9	7.4	7.2
Simmental X	9.9	60	7.8	6.8	7.3	7.3
Charolais X	10.3	63	7.2	7.3	7.4	7.3
Sth Devon X	11.3	76	6.8	7.4	7.3	7.4
Her X Angus	11.3	76	7.3	7.3	7.3	7.3
Red Poll X	11.5	68	7.4	7.3	7.4	7.1
Jersey X	13.2	85	6.8	7.4	7.5	7.5

Data: MARC

It comes as a surprise to many, that Jersey rates so highly for meat quality. It is a fact, that breeds which have been selected for milk production, have higher meat quality ratings (e.g. Jersey, Friesian & Red Poll). The European breeds which are leaner, faster growing and more muscular tend to have lower marbling scores.

Simmental with its milk background is intermediate.

There are some Simmental sires which have been shown to have excellent marbling genetics.

However, they have been very hard to identify, because of access to carcass data. Now, the job is easier because scanning equipment can measure marbling in the live animal whilst scanning for eye muscle area. Soon, there will be an EBV available for marbling. Hopefully, Simmental breeders will scan all their young bulls and heifers so that we can identify trait leaders.