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Animal Science Research Centre - Beef Unit Trial Results – 2016 (e)

**Evaluation of progeny from Terminal and Maternal Simmental bulls with top 1%
and top 60% Terminal Indexes**

Introduction and Objective:

Previous studies at Harper Adams with progeny from Limousin and Angus bulls with different Beef Values/Terminal Indexes have shown significant improvements in performance with calves sired by the higher index bulls (Marsh & Pullar, 2002; Marsh *et al.*, 2007; Marsh *et al.*, 2008; Marsh 2012). To expand the database to confirm that 'EBVs work' an additional study with Simmental sires was carried out on a Harper Adams Beef Focus Farm to evaluate a bull noted for his terminal characteristics against a bull with very good maternal traits and a significantly lower terminal index.

Animals & Timing:

Trial commenced in the winter of 2013 with cows from Mr Ian Willison's commercial suckler herd in Nottinghamshire being inseminated with either a Terminal or Maternal Simmental bull. The calves were therefore born in the autumn of 2014 and the bull calves were intensively finished at just over 1 year old.

Comparison:

The following Simmental bulls were chosen for evaluation:

Omorga Volvo (Terminal Index +87 – Top 1%)
Starline Decision (Terminal Index +55 – Top 60%)

The terminal bull (Volvo) is a harder calving bull and at the time of the trial he had a Calving Ease Direct EBV of -3.9 (top 90% i.e. bottom 10% for the breed) but very high growth figures of +72kg for 400 days putting him in the top 5%. The maternal bull (Decision) is a very easy calving bull with an EBV of +4.9 (top 5%) for Calving Ease Direct, +12kg for 200 day milk (top 1%), +0.9cm (top 10%) for scrotal circumference, -3.7 days (top 1%) for a short gestation length and a positive fat depth EBV of +2.6 sq cm with acceptable EBVs for growth (+47kg for the 400 day weight EBV which is just in the top 75%). This makes him an ideal bull to breed herd replacements. Full details of the bulls EBV's from Simmental BREEDPLAN blup data for September 2013 are shown in appendix 1.



Ormorga Volvo (Terminal Index +87 – Top 1%)

Since the blup evaluation of 2013 the EBVs and indexes have changed slightly. This is inevitable with the increase in data (accuracy) and breed improvement within the Simmental.

Herd Management:

The suckler herd at Ian Willison's Williamswood Farm comprises of some 90 cows of predominantly Simmental x British Blue breeding. Replacement heifers calve at 21-23 months old. Calving takes place indoors starting in mid-late July with the majority of the herd calving during August. Once mothered-up the cow and calf are turned out ASAP. Housing usually takes place in mid-end October. Winter nutrition for the cows is based on maize and grass silage with creep feed for the bull calves offered from 4 weeks old. The bull calves are weaned when the cows are turned out in April and they are intensively finished on top quality maize and grass silage and blend. Cows with heifer calves are turned out in mid-March and the calves are weaned in June. The heifer calves are not fed creep post-Christmas.

Results:

Table 1 Calving characteristics and growth rates to weaning

Sire	Terminal sire - Volvo		Maternal sire - Decision	
	Bull	Heifer	Bull	Heifer
Calf sex				
Gestation Length	293	286	291	285
Calving Ease Score (1-6)¹	1.88	1.06	1.29	1.14
Birth Wt (kg)	54.5	46.7	47.7	45.6
200 day wt (kg)	361	287	328	270
DLWG (kg)	1.54	1.20	1.40	1.12

¹ Calving Ease Score: 1= Unassisted, 2= Easy Pull, 3 = Hard Pull, 4= Surgical 5= Abnormal Presentation, 6 = Elective Surgery.

Calf performance 'mirrors' the EBVs for the bulls. Volvos calves recorded longer gestation length, recorded heavier birth weights were heavier with more requiring assistance. Volvo's calves (bull and heifer average) had significantly higher DLWGs (+0.11kg) and 200 day weights (+24kg).

The mean calf 200 day weight for the herd was calculated to be 307kg (1.32kg ave DLWG) equating to an efficiency factor of 48.2% based on the mean cow weight of 637kg when the cows were weighed at weaning.

The bulls were finished on good quality maize silage (29% DM, 33% starch and grass silage (38%DM, 11.2ME) and blend in a TMR formulated to contain 14% CP in DM. The starch content of the TMR was initially 37% in the DM which dropped to

23% when the bulls were 11 months old. The silage and blend intakes averaged 11.4kg (3.7kg DM) and 7.7kg per head per day respectively equating to a ration with 35% silage and 65% blend on a DM basis.

Table 2 Slaughter performance and carcass grades of the bull calves

	Terminal sire - Volvo	Maternal bull - Decision
Slaughter age (months)	13.3 (406d)	13.4 (409d)
Slaughter weight (kg)	713	679
DLWG from birth (kg)	1.62	1.54
Carcass weight (kg)	409	389
DCG from birth (kg)¹	1.01 (0.95)	0.96 (0.90)
Conf score (1-7)²	5.1 (-U)	5.0 (-U)
Fat score (1-7)²	3.4 (3/4L)	3.5 (3/4L)

¹ DCG in brackets deducts 24kg for the bull calf birth carcass weight.

² EUROP carcass classification: Conformation: P+=1 and E=7, Fat class: 1=1 and 5H=7.

The AHDB Beef & Lamb target for intensive finishing suckler bulls is a 350kg carcass at 14 months old. Ian Willison's bulls significantly exceeded these targets. It is clearly shown in table 2 that the performance of the finishing bulls mirrored the EBVs of the sires. The sons from Volvo recorded higher DLWGs (+0.12kg) and DCGs (+0.05kg) and were slaughtered 3 days earlier with an extra 20kg of carcass worth some £68 per bull with a beef price of £3.40/kg. Despite being a maternal bull the performance of the bull calves from Decision was still very respectable indeed. What must be noted is that there was a higher level of calving difficulty with Volvo and 1 calf was lost at calving. Some 39% of the bulls graded fat class 4L so could therefore be killed younger at lighter carcass weights.

The majority of Decisions heifers were kept as home-bred replacement. The heifer calves from Volvo were sold at a premium (due to the farm's high herd health status) for use as recipients in ET programmes to a local pedigree breeder at 15 months old.

Conclusions:

- Overall performance of the bulls was excellent exceeding the AHDB targets for intensive finishing suckled bulls.
- The bull calves sired by the top 1% terminal bull recorded significantly higher DLWGs, 200 day weights, slaughter and carcass weights.
- The calves sired by the maternal bull with a top 60% terminal index recorded shorter gestation length, lower (easier) calving scores and lower birth weights. Despite being a maternal sire the performance of the bull calves was still very respectable.
- Calf performance mirrors the EBVs of the sire.

P.S A series of articles on Ian Willison's suckler herd was featured in the Farmers Weekly from October 2015 to June 2016.

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References:

Marsh, S.P. and Pullar, D. 2002 Production and carcass traits of progeny sired by Limousin bulls with high and below average beef values. *Proceedings of the British Society of Animal Science*. Paper 193.

Marsh, S.P., Vickers, M. and Wharton, N. 2007 Evaluation of progeny from beef bulls with either a Top 1% or Top 10% Beef Value. *Proceedings of the British Society of Animal Science*. Paper 152

Marsh, S.P., Vickers, M. and Wharton, N. 2008 Evaluation of progeny from Limousin bulls with either a Top 1% or Bottom 1% Beef Value. *Proceedings of the British Society of Animal Science*. Paper 206

Marsh, S.P. 2012 Evaluation of progeny from Angus bulls with Top 10% and Top 70% Terminal Indexes. *Harper Adams University, Animal Science Research Centre - Beef Unit Trial Results – 2012 (d)*.

Appendix

Simmental bull EBV's – September 2013 blup

	Omorga Volvo			Starline Decision			Breed Avg. EBVs for 2011
	EBV	Accuracy (%)	Percentile Band	EBV	Accuracy (%)	Percentile Band	
Calving Ease Direct (%)	-3.9	92	Top 85%	+4.9	87	Top 5%	-0.6
Calving Ease DTRS (%)	-1.1	81	Top 60%	-1.2	85	Top 60%	-0.5
Gestation Length (days)	-1.0	92	Top 10%	-3.7	87	Top 1%	+0.2
Birth Wt (kg)	+4.7	96	Top 99%	+0.4	95	Top 5%	+2.1
200 Day Wt (kg)	+39	93	Top 5%	+24	93	Top 80%	+29
400 Day Wt (kg)	+72	93	Top 5%	+47	92	Top 65%	+52
600 Day wt (kg)	+71	88	Top 10%	+56	90	Top 35%	+57
Mat Cow Wt (kg)							+57
Milk (kg)	+7.0	63	Top 15%	+12	89	Top 1%	+4
Scrotal Size (cm)	+2.8	88	Top 1%	+0.9	70	Top 10%	+0.4
Carcase Wt (kg)	+43	78	Top 15%	+33	83	Top 65%	+36
Eye Muscle Area (sq cm)	+4.8	64	Top 1%	+2.6	55	Top 55%	+2.8
Fat Depth (mm)	0.0	75	Top 40%	+0.9	67	Top 99%	+0.1
Retail Beef Yield (%)	+1.2	71	Top 5%	-0.4	63	Top 95%	+0.3
IMF (%)	-0.3	63	Top 90%	+0.6	54	Top 1%	+0.0
Terminal Index (GBP)	+87		Top 1%	+55		Top 60%	+60
Self Replacing Index (GBP)	+108		Top 1%	+78		Top 20%	+66

Note: The Fat Depth of Starline Decision is +0.9mm and stated as being in the bottom 99% for the breed. Positive Fat Depths are important for bulls used to breed herd replacements and I would regard him as a top 1% bull for this EBV in this situation.