

SELECTION for PROFIT

a success story

12 October 2016

SELECTION FOR PROFIT
Johan Styger BTB Simmentaler

(1)

If you're not
selecting for profit,
we wish you well
with your hobby.

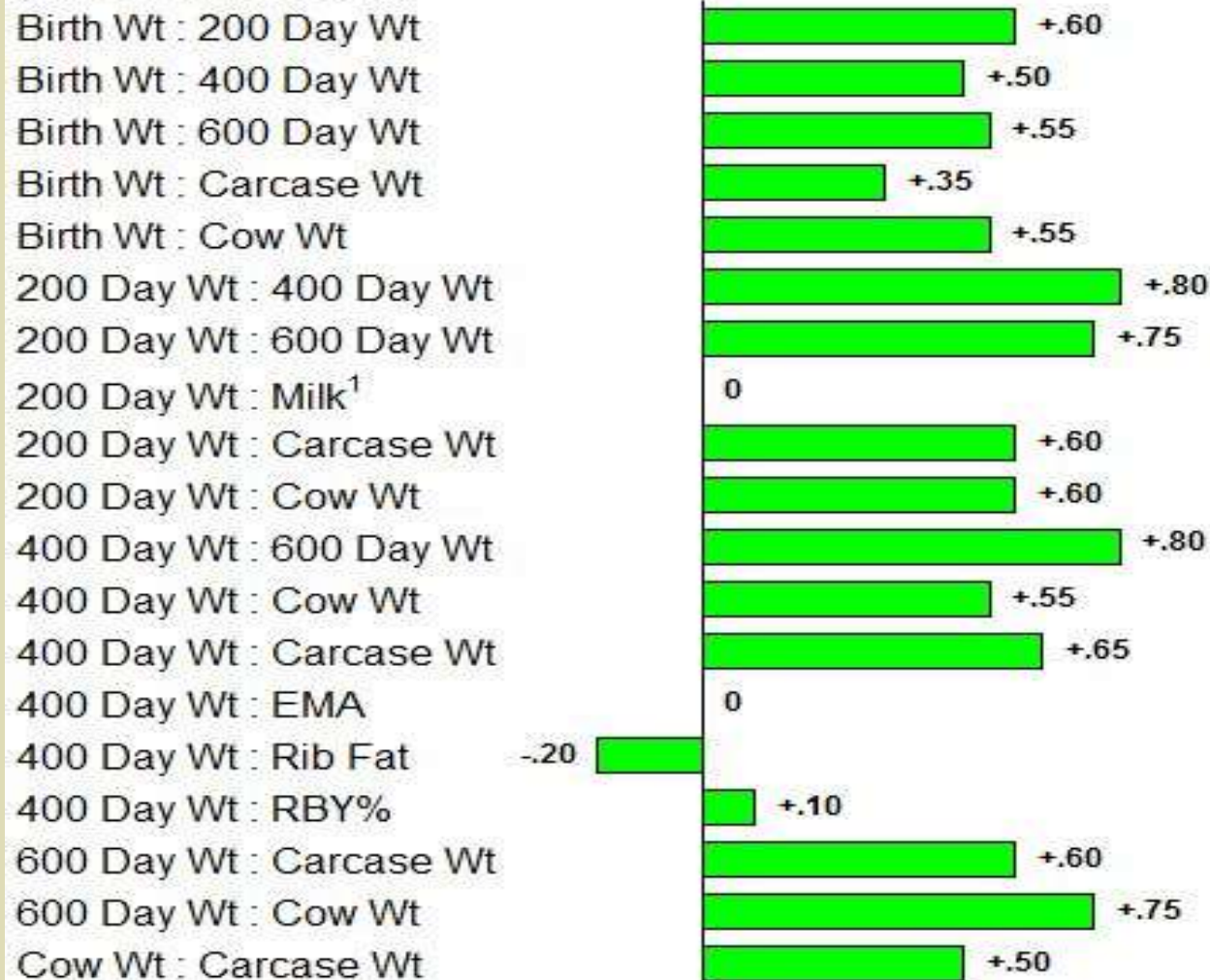
What is genetic improvement ?

- the use of genetically superior animals as the parents of the next generation
- genetic superiority is the function of many variables, including production environment and market being supplied
- most measures of genetic superiority is based on **potential profit**

GROWTH TRAITS :

Correlations & antagonistic relationships

(a) Growth traits



CALVING & FERTILITY TRAITS:

Correlations & antagonistic relationships

(c) Calving Ease & Fertility Traits



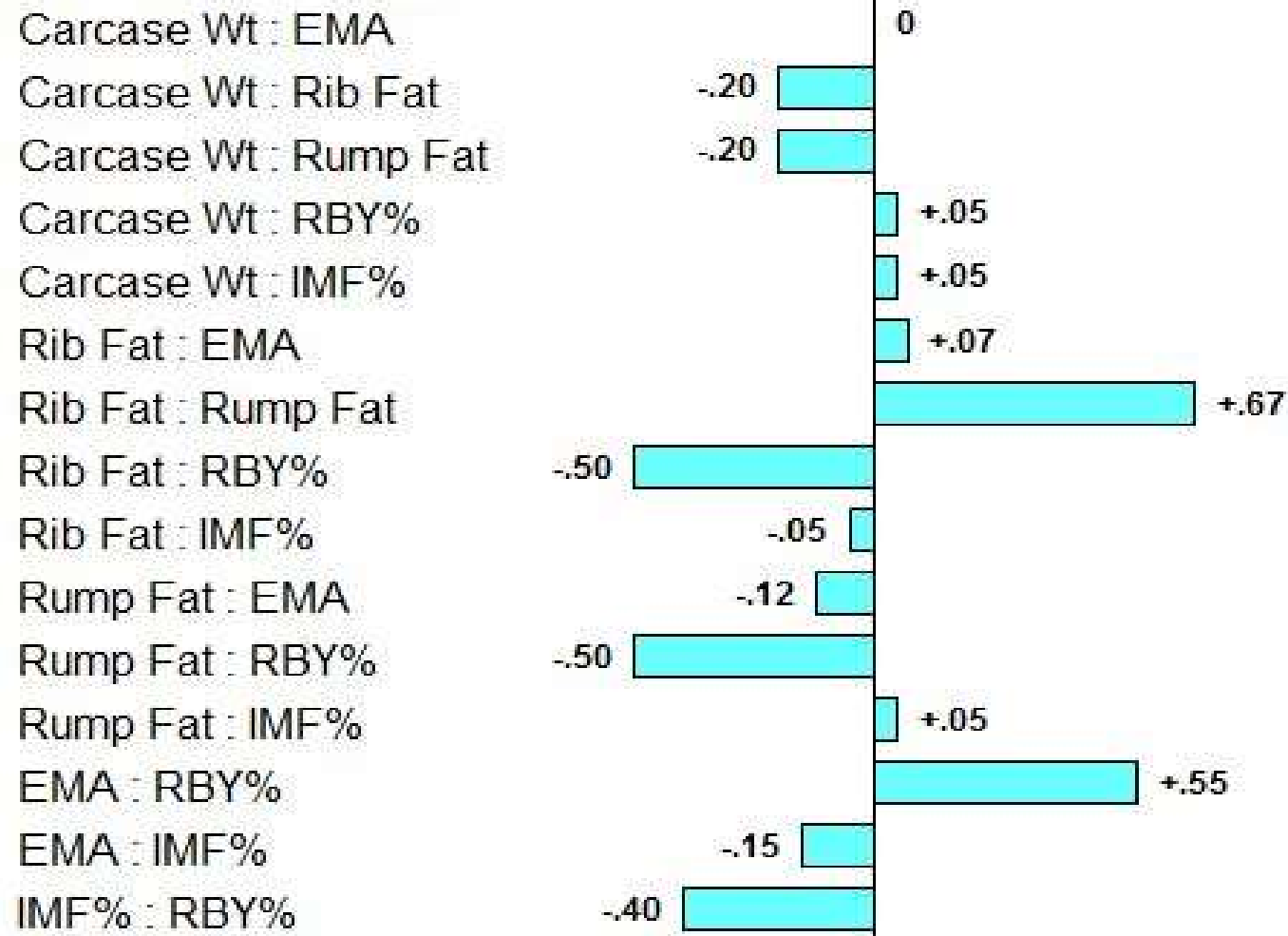
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CARCASE TRAITS:

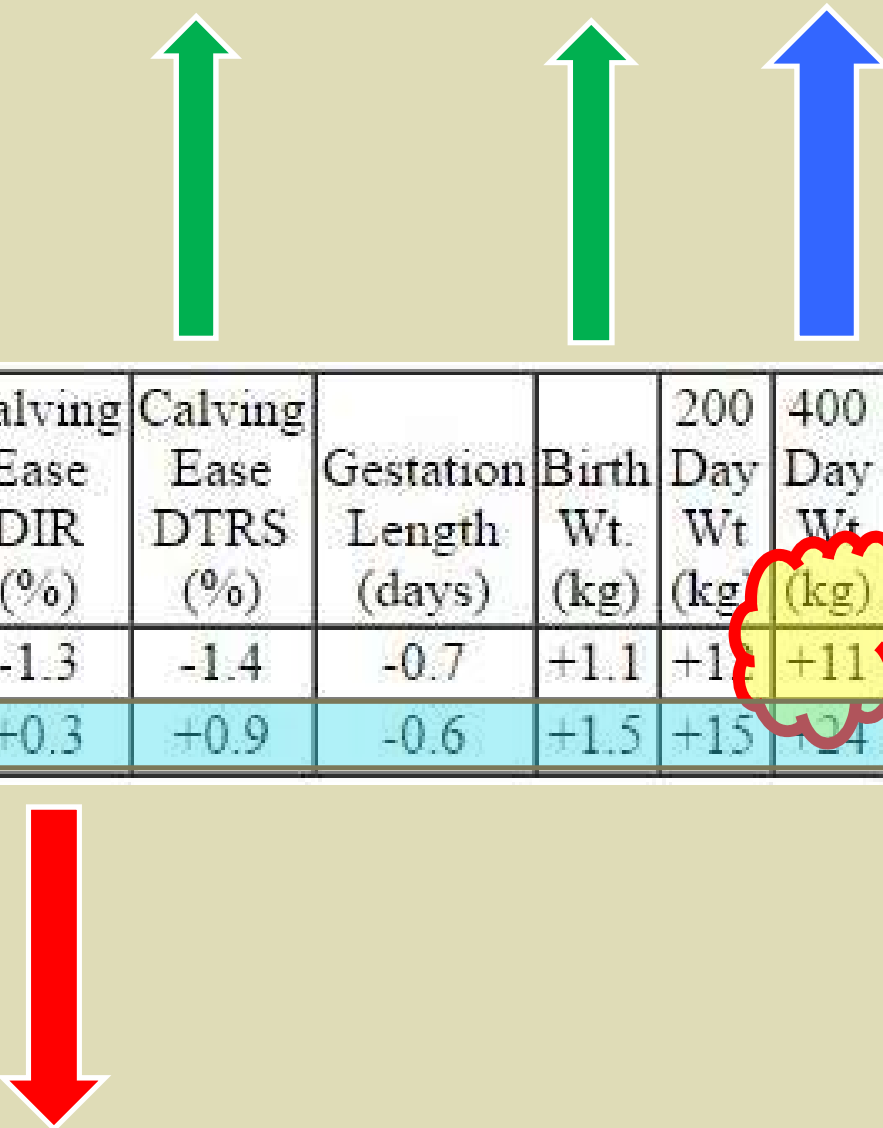
Correlations & antagonistic relationships

(b) Carcase Traits²



THE ANTAGONISTS

Typical herd EBV profile



	Calving Ease DIR (%)	Calving Ease DTRS (%)	Gestation Length (days)	Birth Wt. (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)
EBV	-1.3	-1.4	-0.7	+1.1	+11	+11	+15	+14	+6
EBV	+0.3	+0.9	-0.6	+1.5	+15	+24	+30	+32	+5

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Why is multiple trait selection..

- **Difficult?**
 - Lots of EBVs
 - Correlations between traits
 - Antagonistic relationships
 - Some EBVs for Economically Relevant Traits (ERT) some for Indicator Traits



FOLLOW THE MONEY !!



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OVERVIEW

What are Selection Indexes ?

- Defined selection for purpose
- Follows a Breeding Objective
- Relative Economic values



Why do we need Selection Indexes?

- **Actual** multiple trait selection

Selection Index Defined

- **Two Step approach by Henderson (1950s)**
 - Calculate predictions of genetic merit (EBV) for each trait in selection objective
 - Weight each genetic prediction by it's Relative Economic Value (REV)



A Tool for Multiple Trait Selection

- **Selection Indexes**
 - Objective
 - Easy to use and interpret (Rand)
 - Economically driven
 - Links ERTs and Indicator Traits
 - Customizable (Site/user specific)
- **Breedplan: BreedObject software**

Compiling Selection Indexes

- **Defining the Breeding Objective**
- **Based on the “ideal” animal for a particular enterprise**
 - **Market requirements** (At the end of the value chain)
 - Export (carcass weight, fat cover, IMF)
 - Domestic (carcass weight, fat cover)
 - **Production system**, returns affected by weight & price
 - Harvest age
 - Carcass weight and fatness
 - Grassfed
 - Grainfed (Number of days)
 - **What happens to the heifers?**
 - Terminal or self replacing
 - **Production costs**
 - Cost of supplying extra feed
 - Cost of non-survival
 - Time taken to manage calving
 - Labour cost

Current Southern African Selection Indexes



Selection Indexes	Breed
Self Replacing Grassfed Index	Brahman, Simbra, Simmentaler
Self Replacing Feedlot	Brahman, Simmentaler, Simbra
Self Replacing Weaner	Brahman, Simbra
Terminal Sire	Simmental



The BTB selection Index

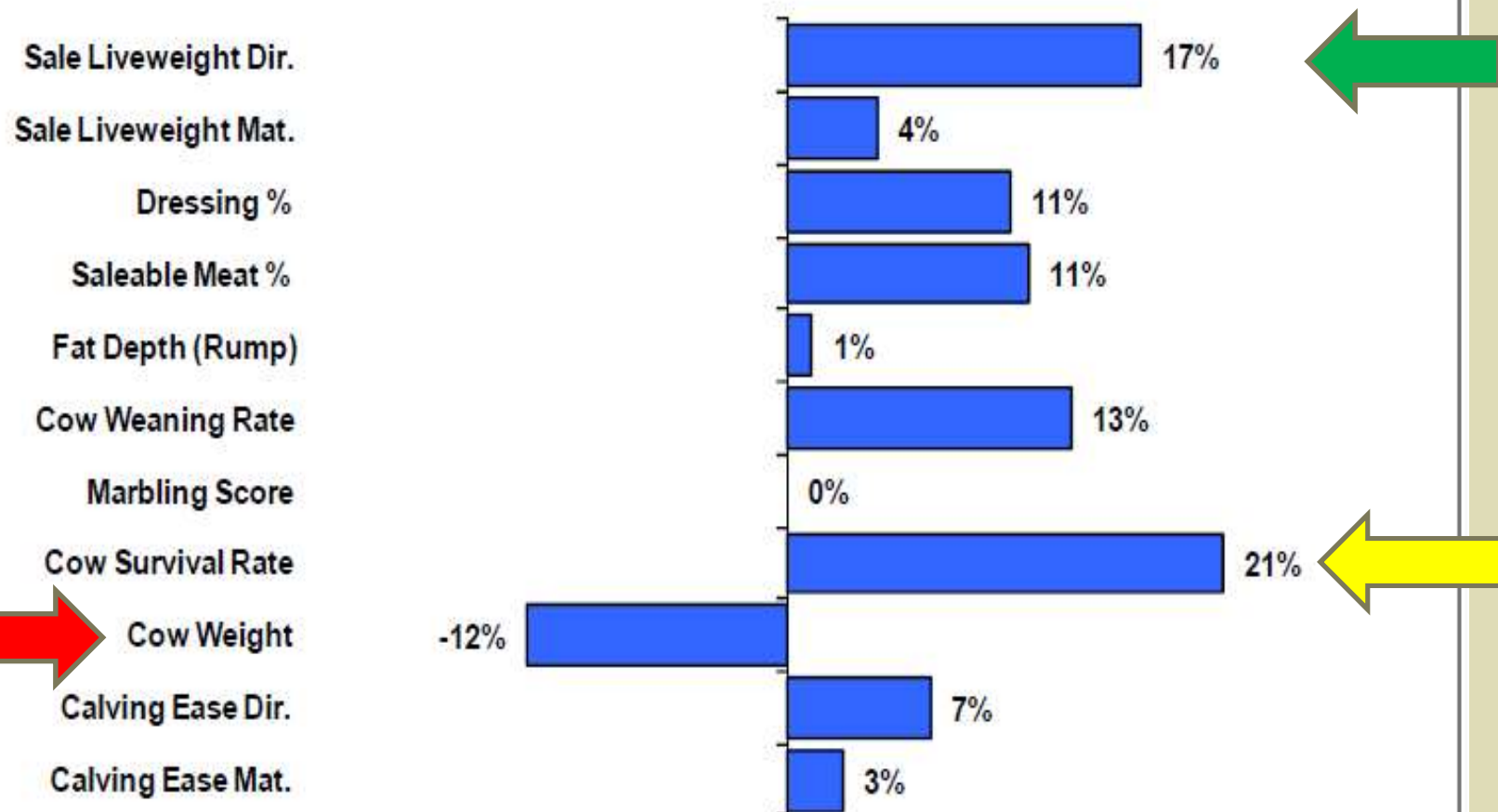
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Simmentaler Feedlot Index

The Feedlot Index estimates the genetic differences between animals in terms of net profitability per cow. The Feedlot Index is aimed at a high fertility, self replacing (keeping replacement and breeding progeny) pure bred herd. Calves are weaned at 7 months (at around 250kg) and then steers are fed extra rations for 120 days to be slaughtered at around 11 months and 430kg steer live weight. **Significant emphasis is placed on calving ease, 400 day weight and carcass yield.**

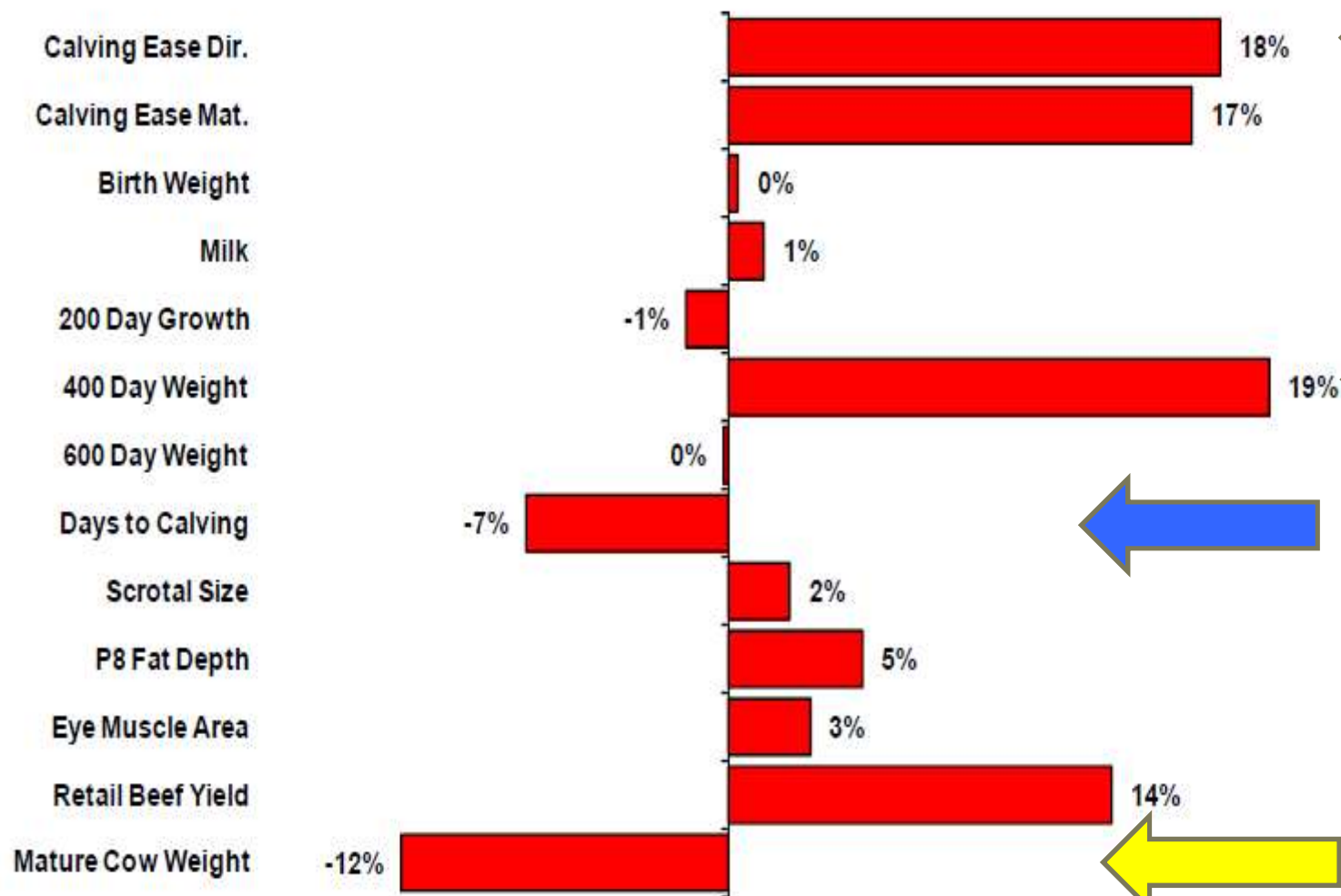
Self Replacing Feedlot Index - Profit Drivers



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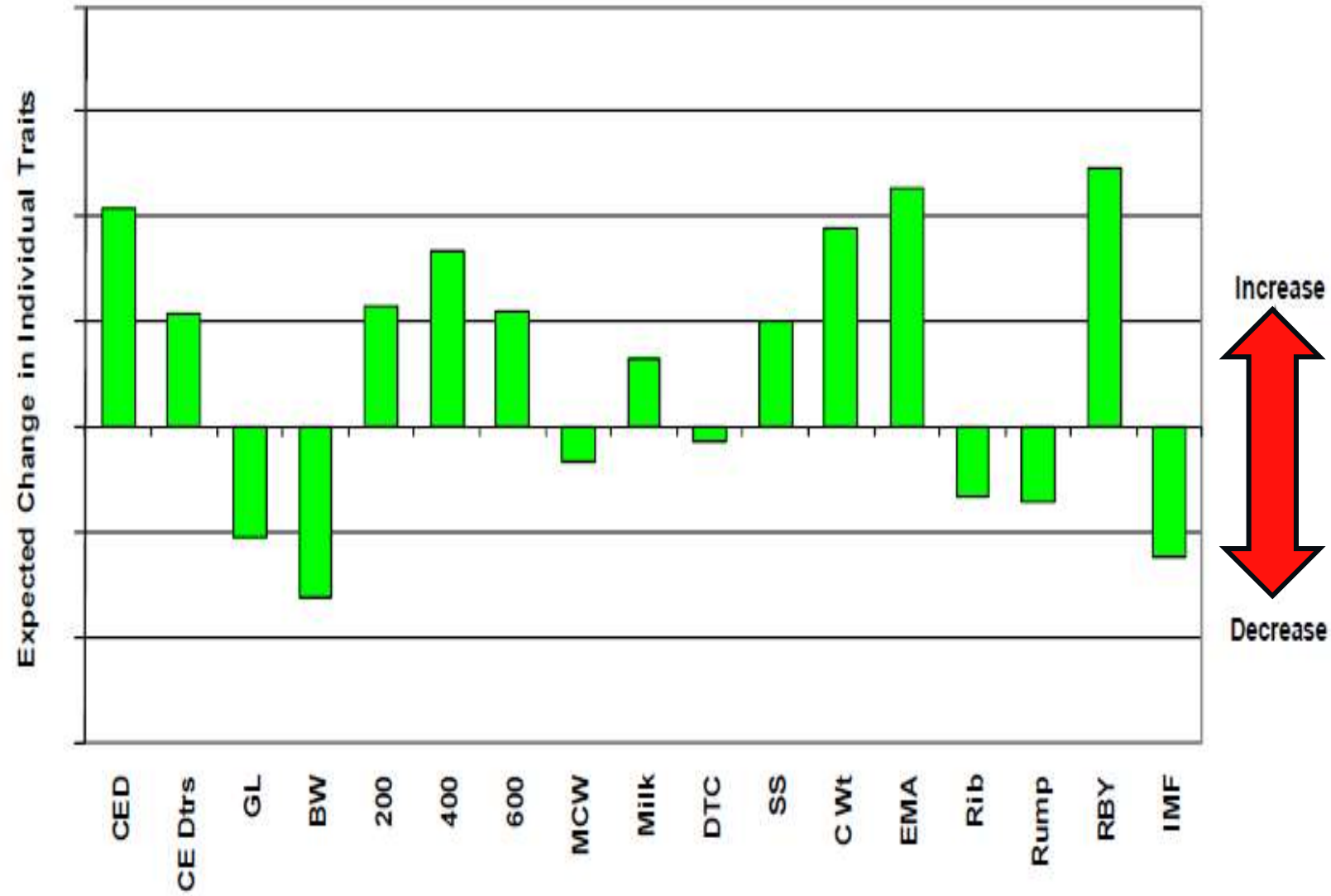
Self Replacing Feedlot Index - EBV Weightings



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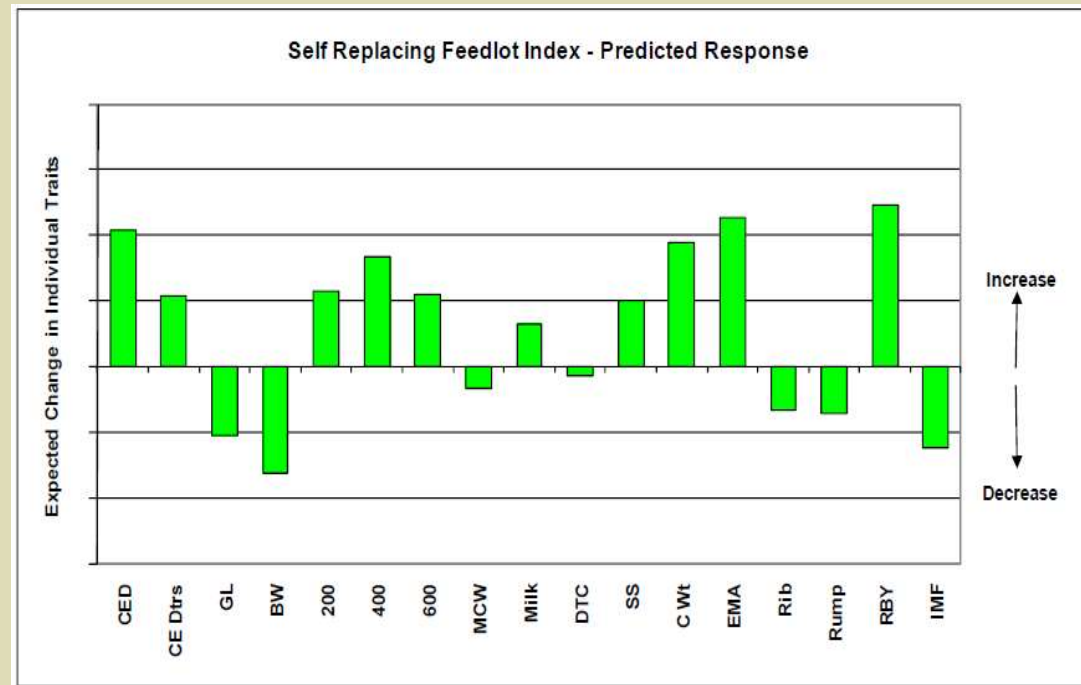
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Self Replacing Feedlot Index - Predicted Response



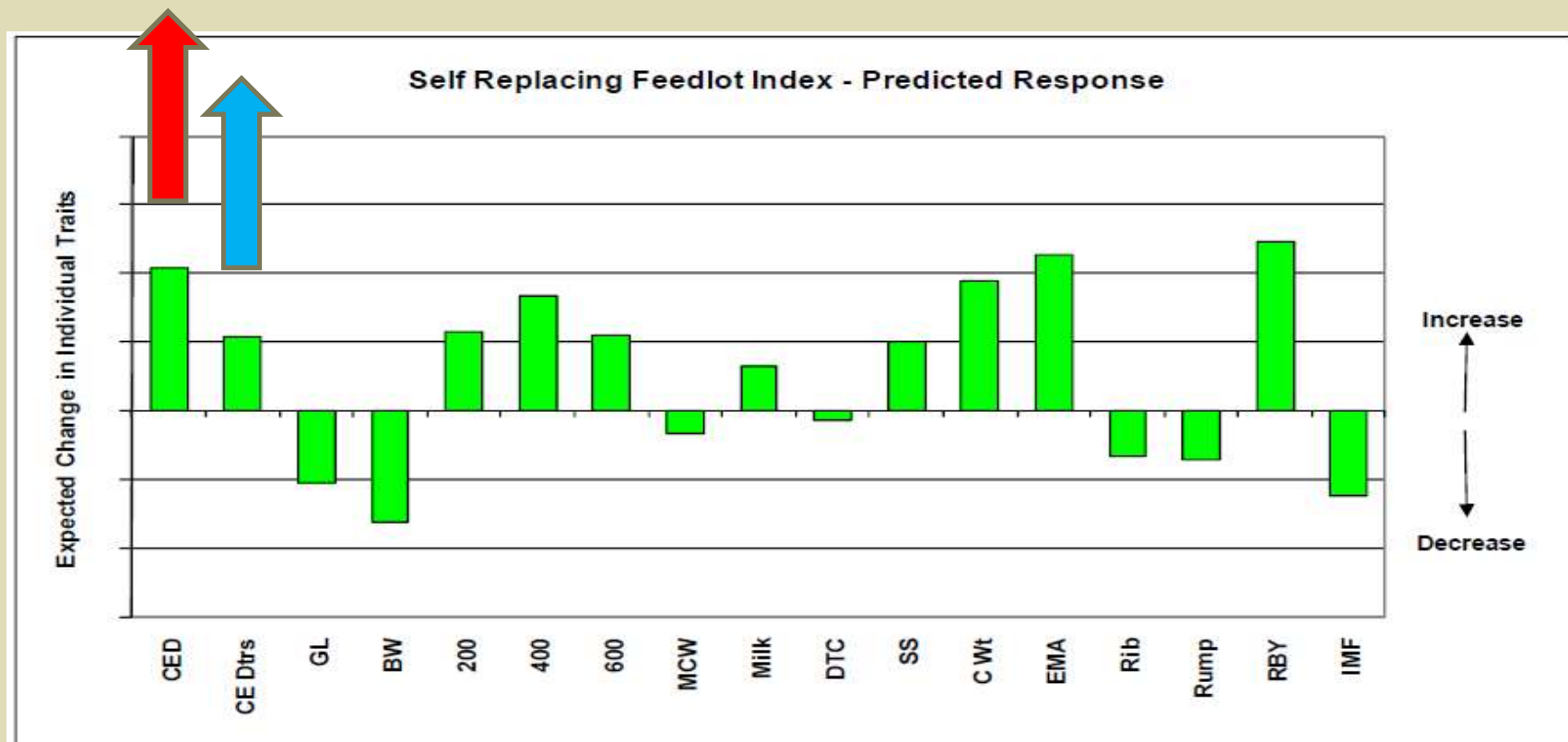
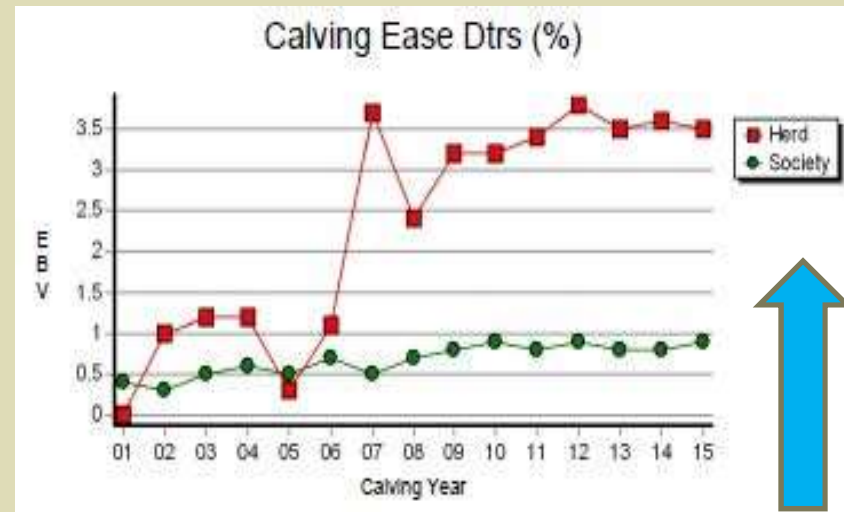
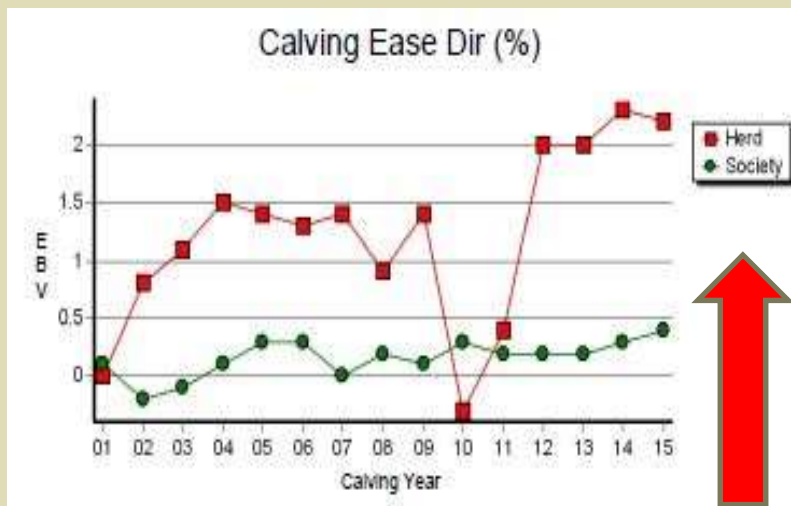
Self Replacing Feedlot Index SELECTION RESPONSE

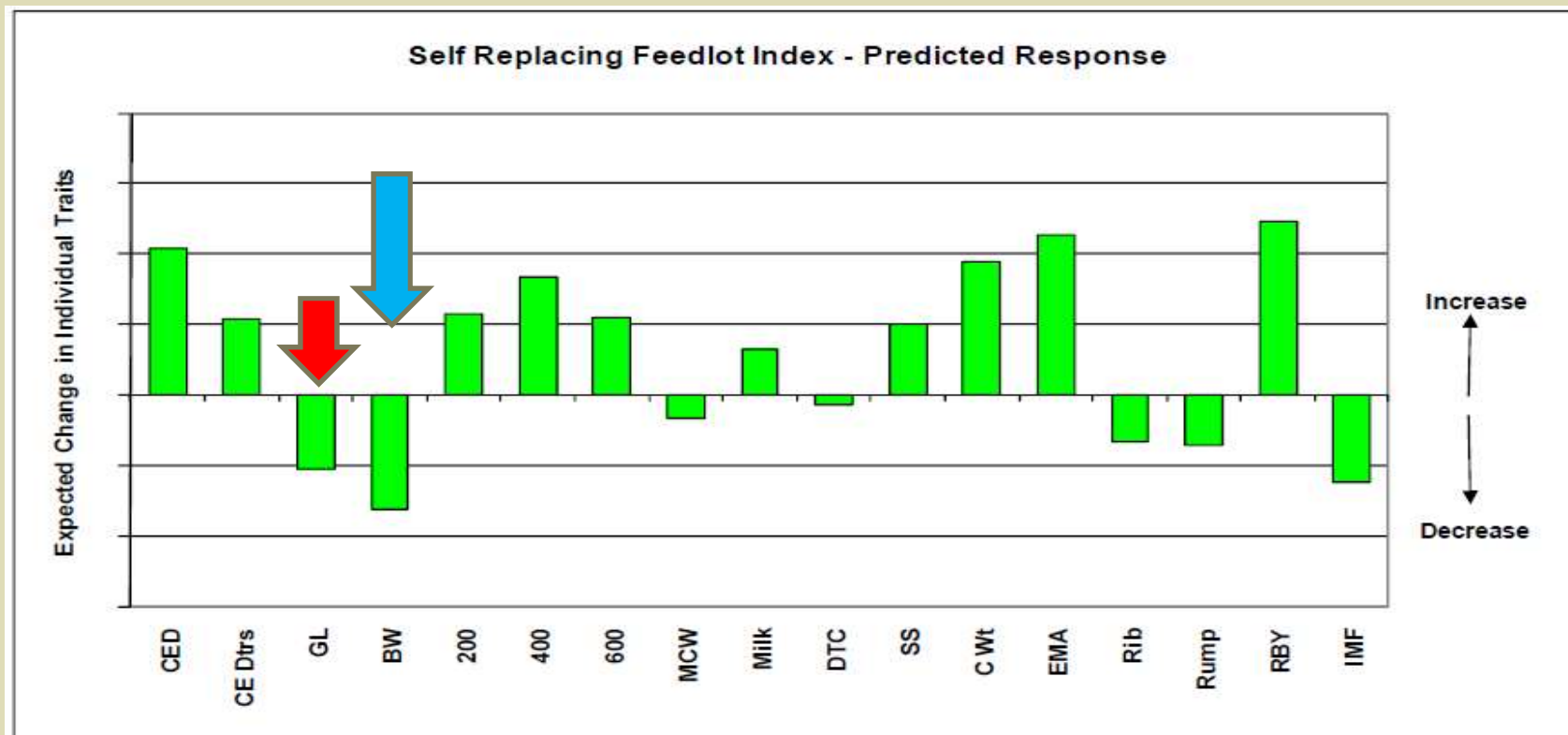
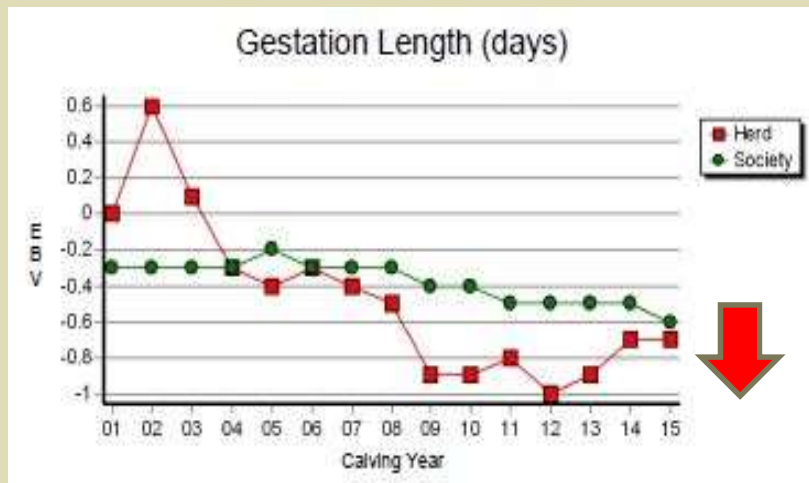
BTB SIMMENTALERS



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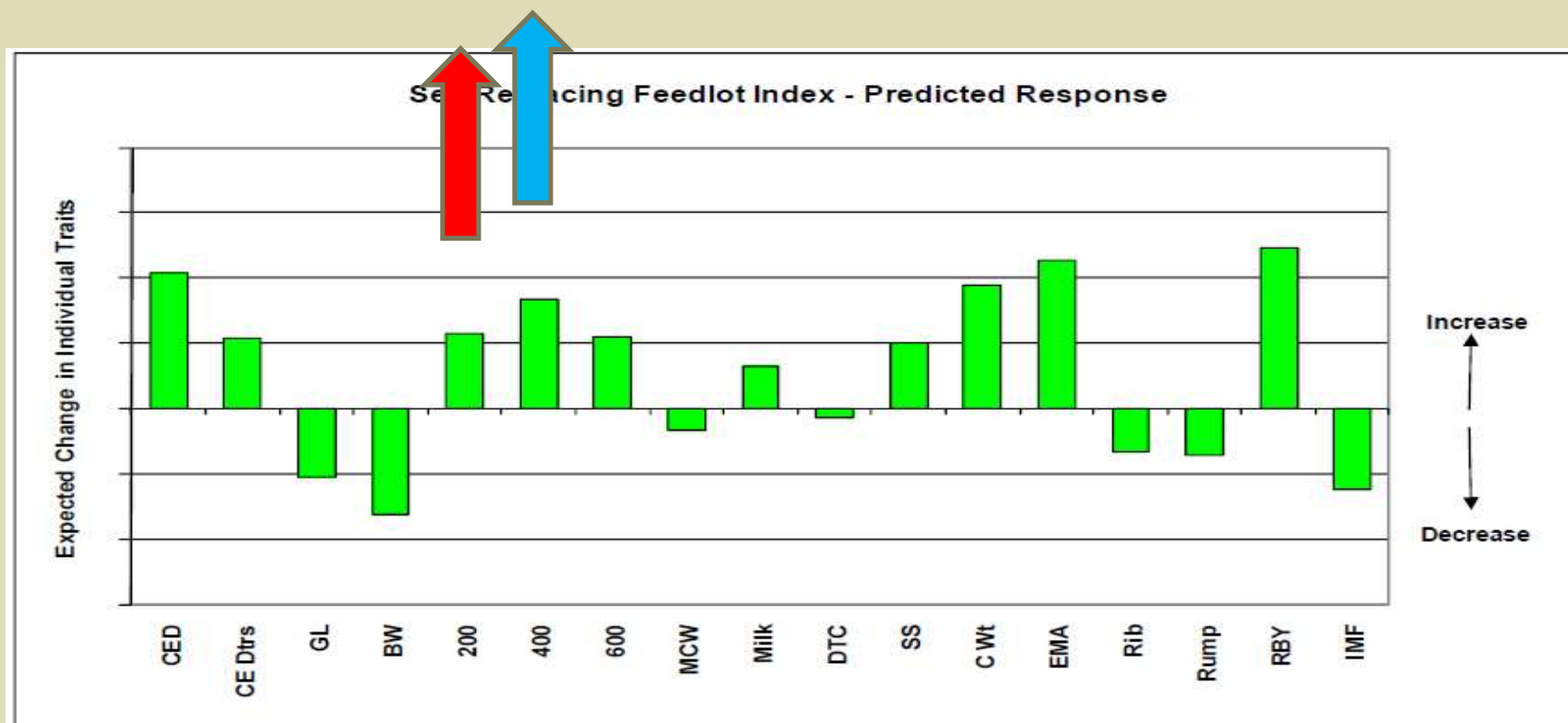
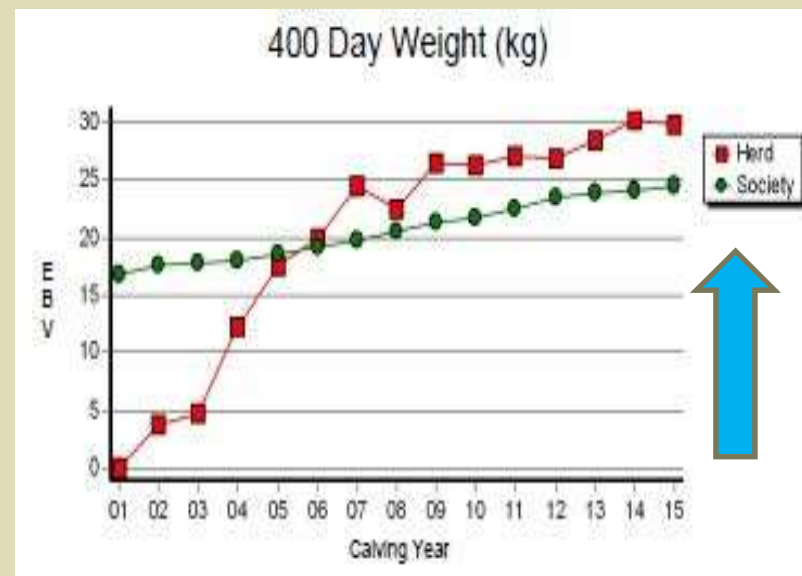
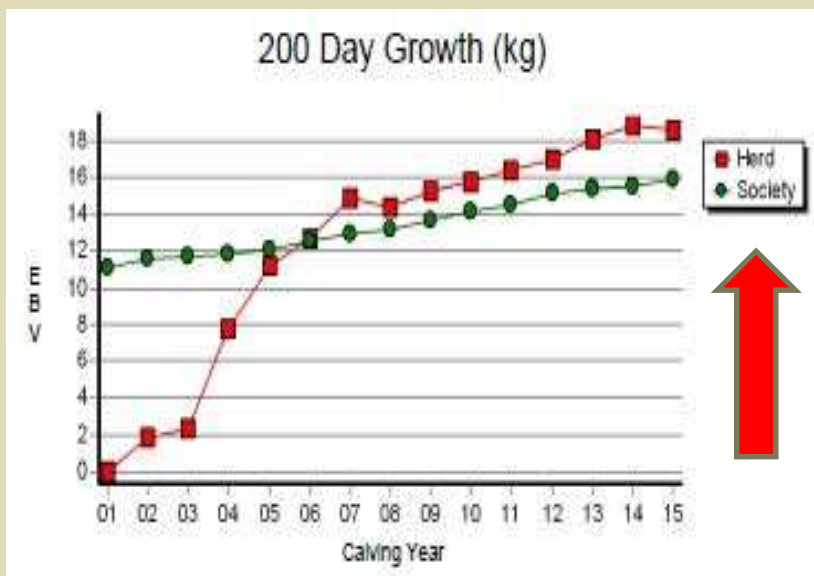
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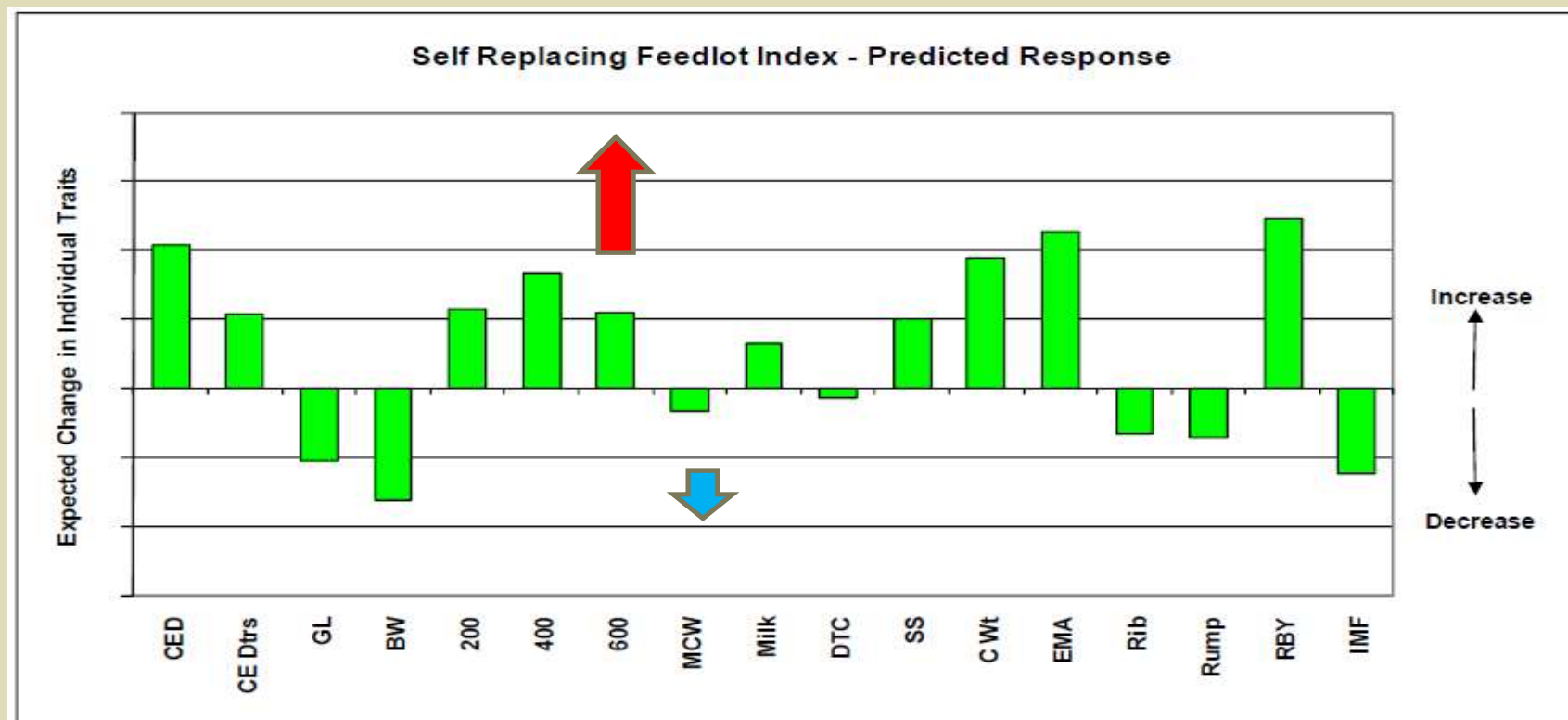
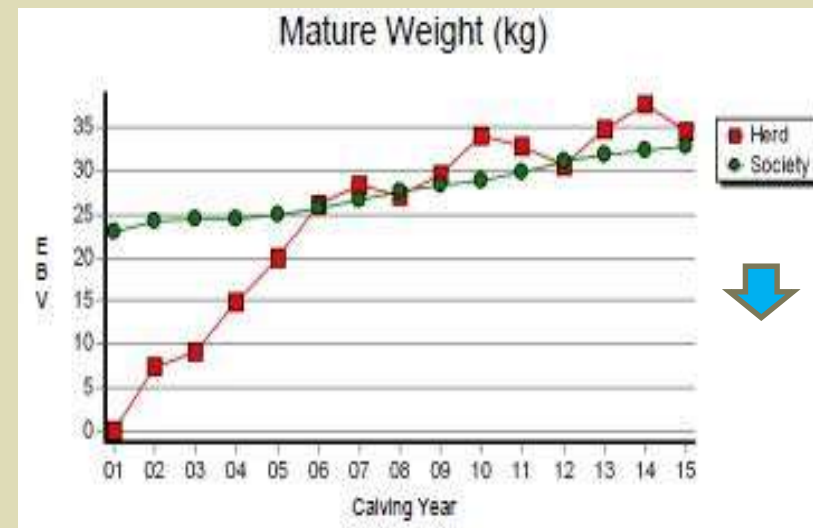
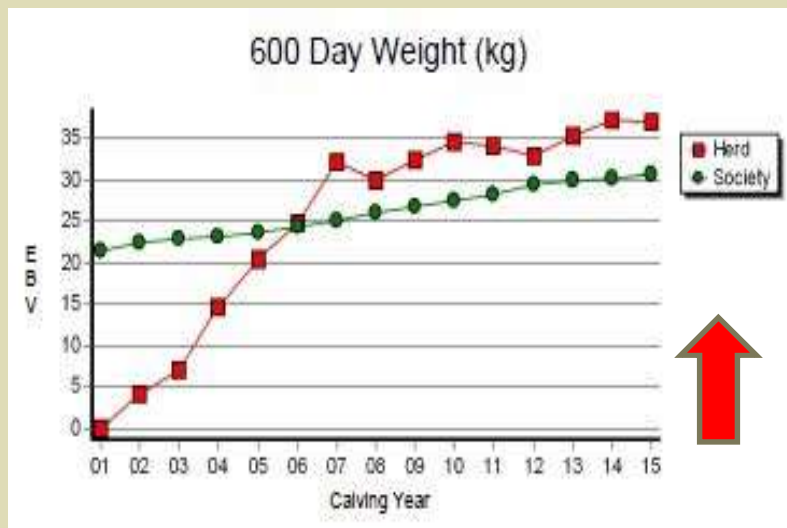




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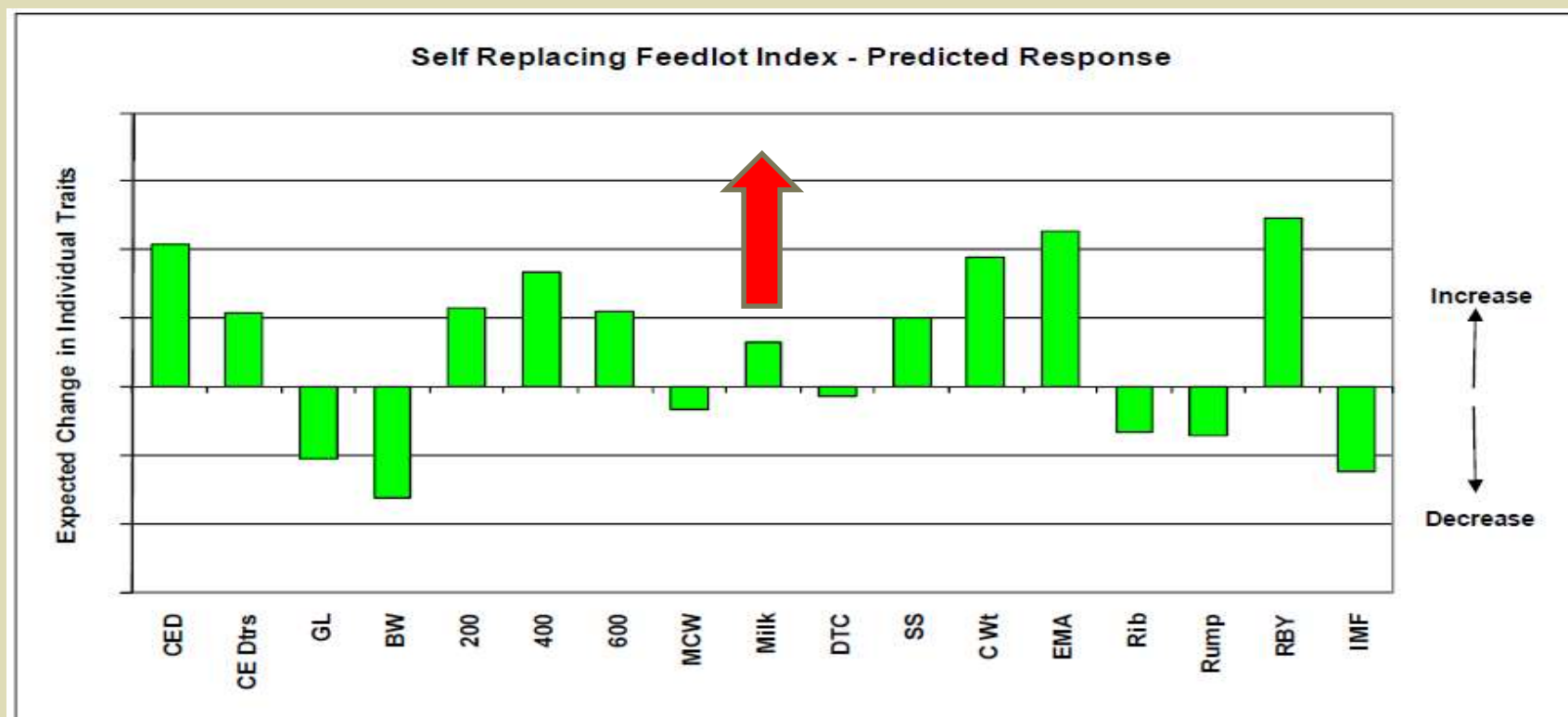
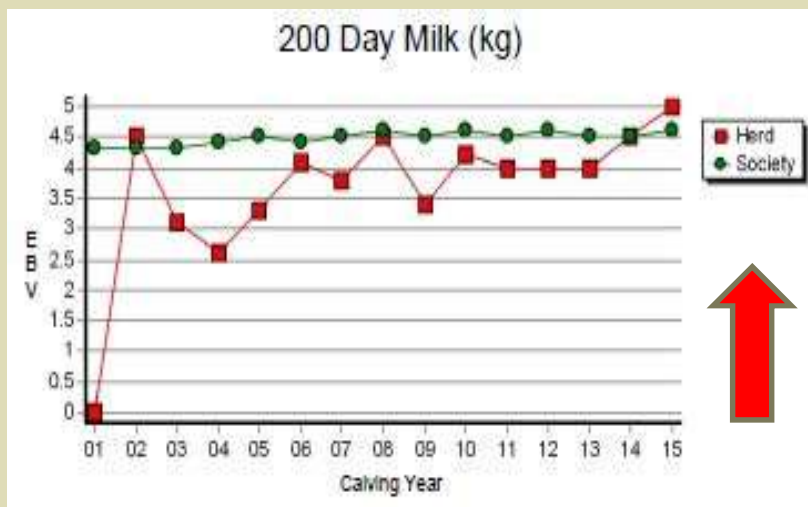
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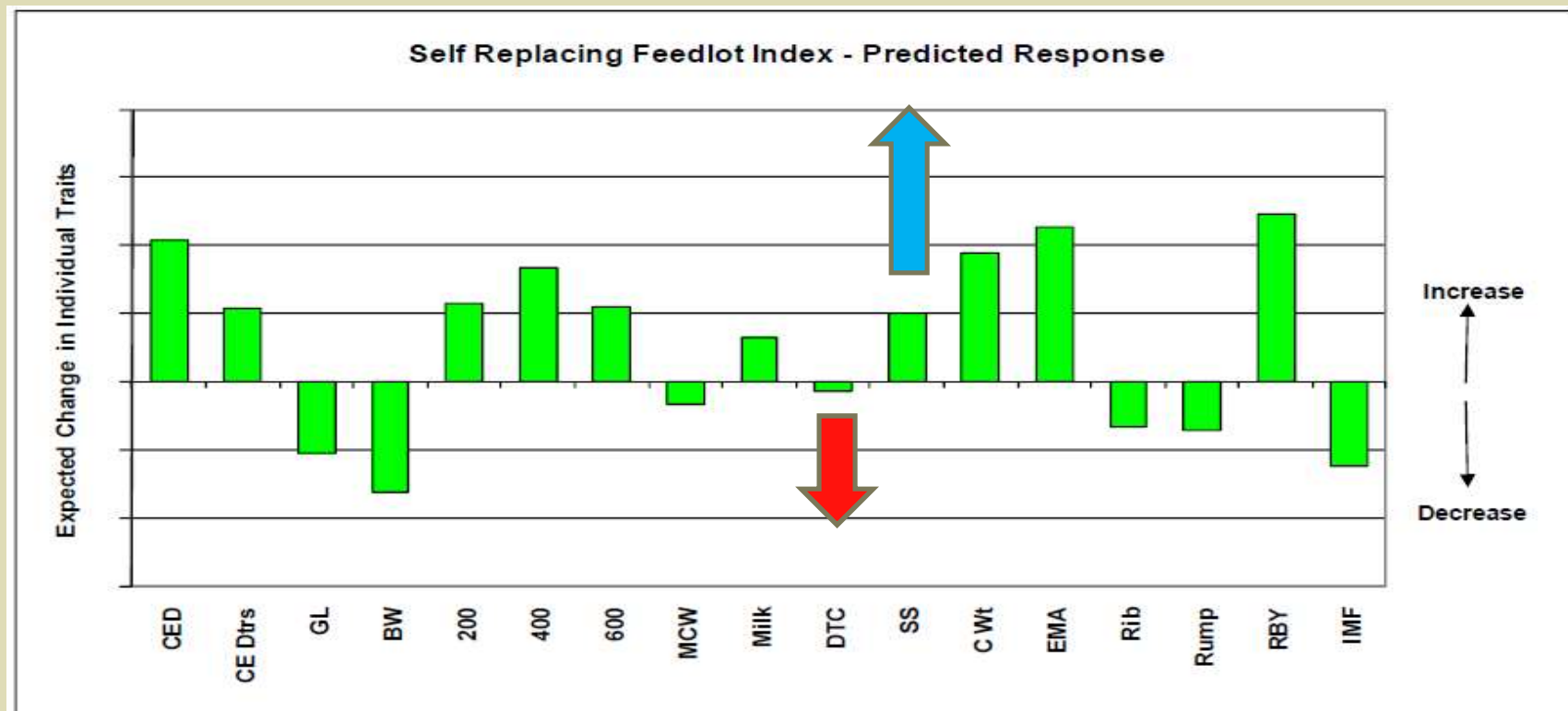
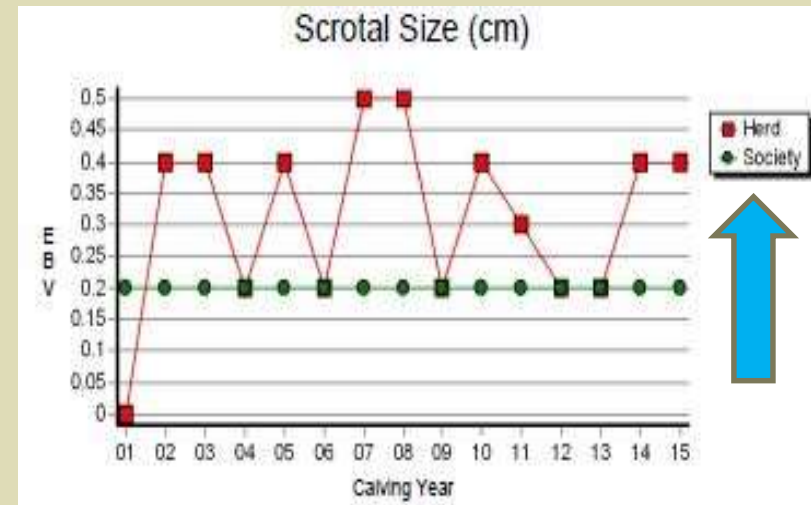
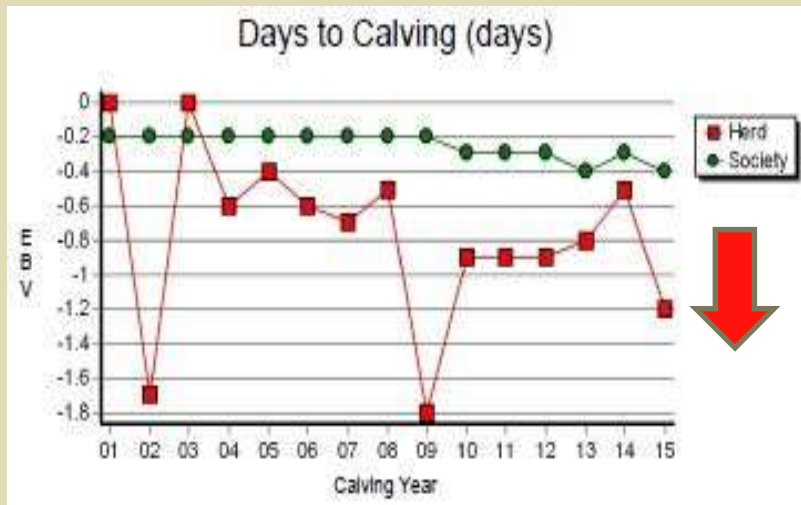
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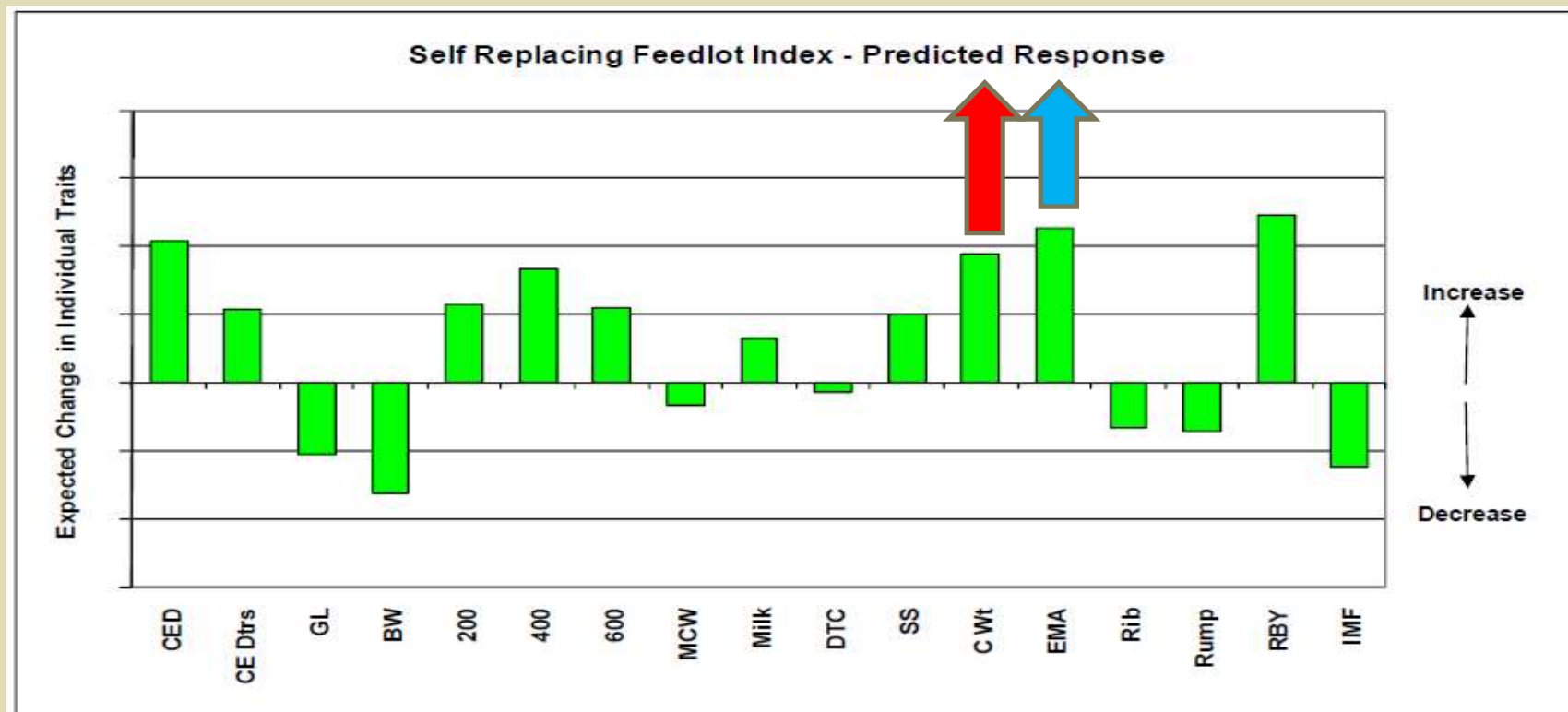
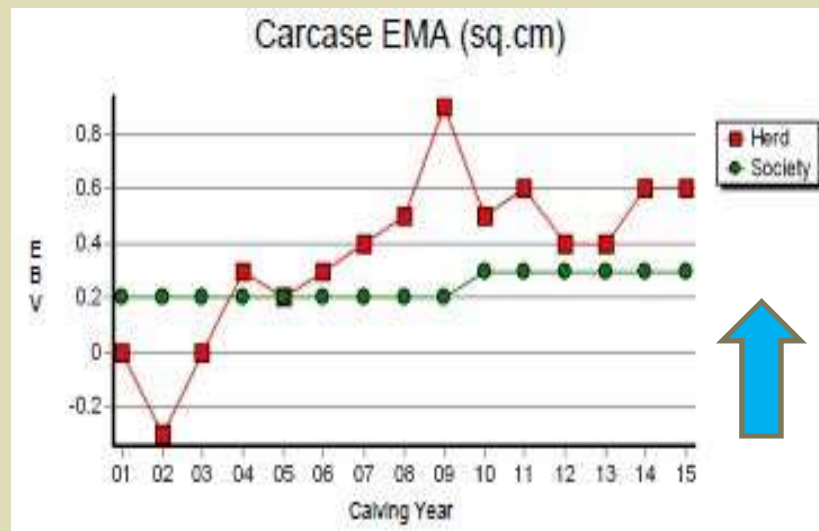
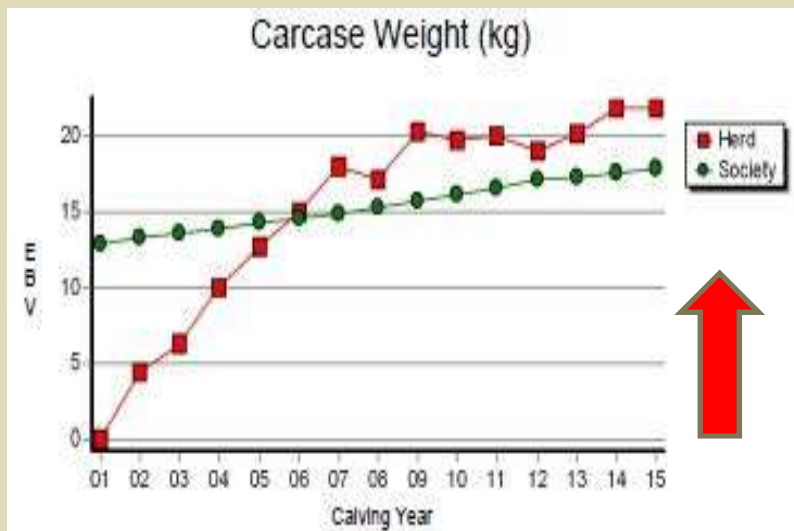
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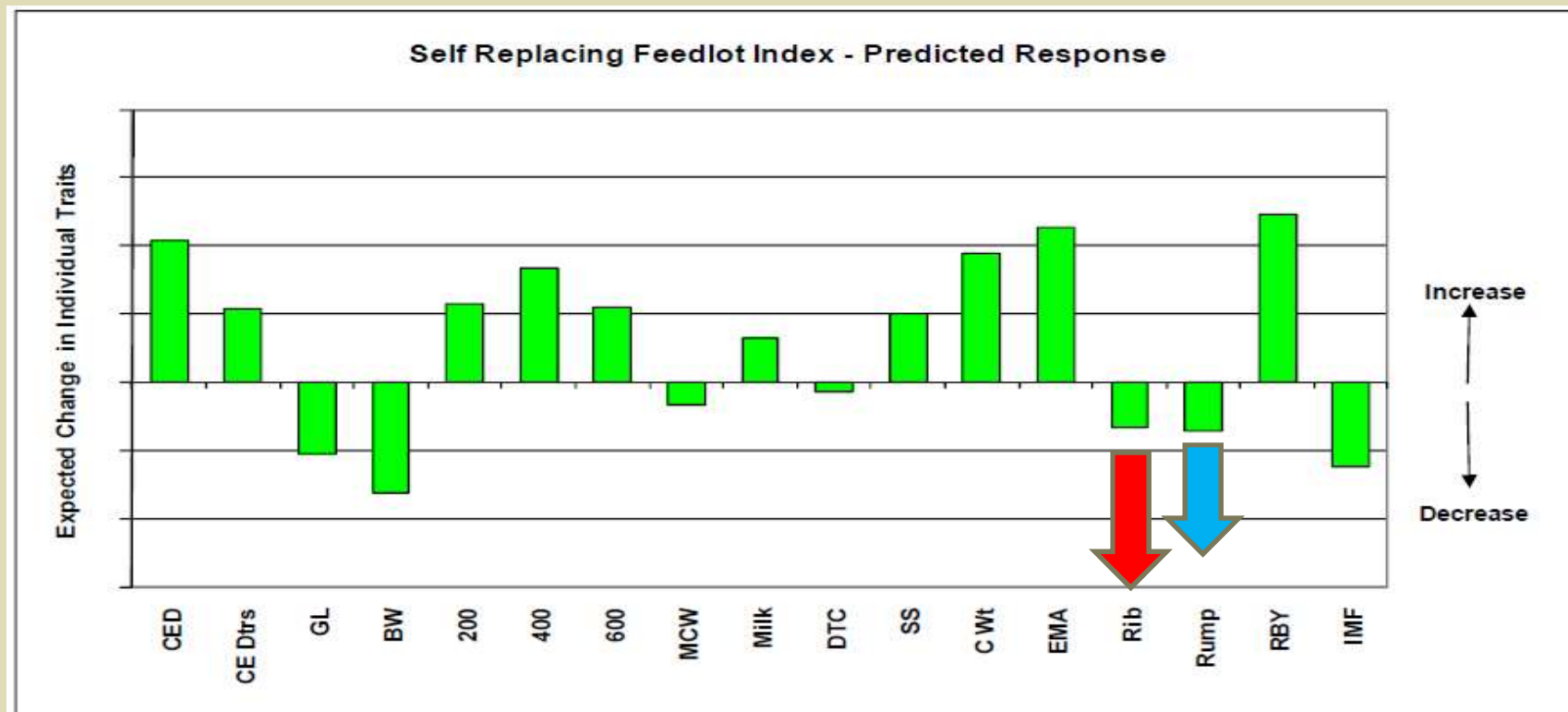
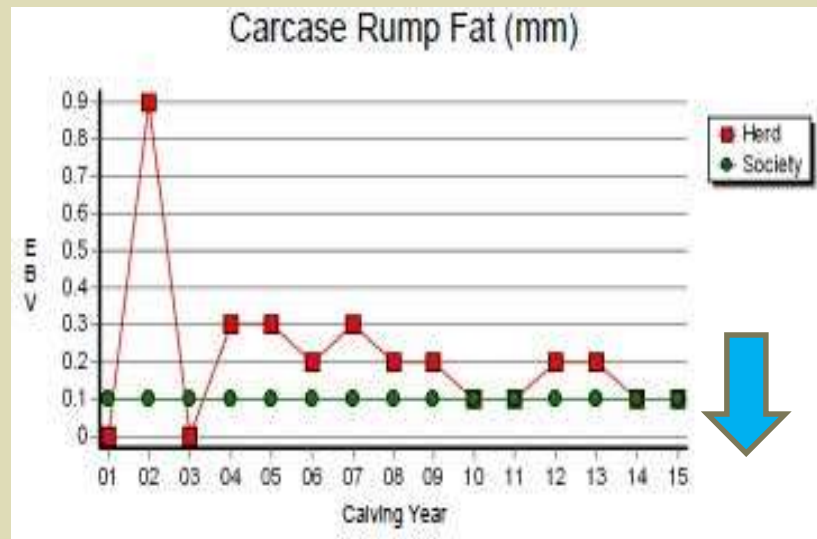
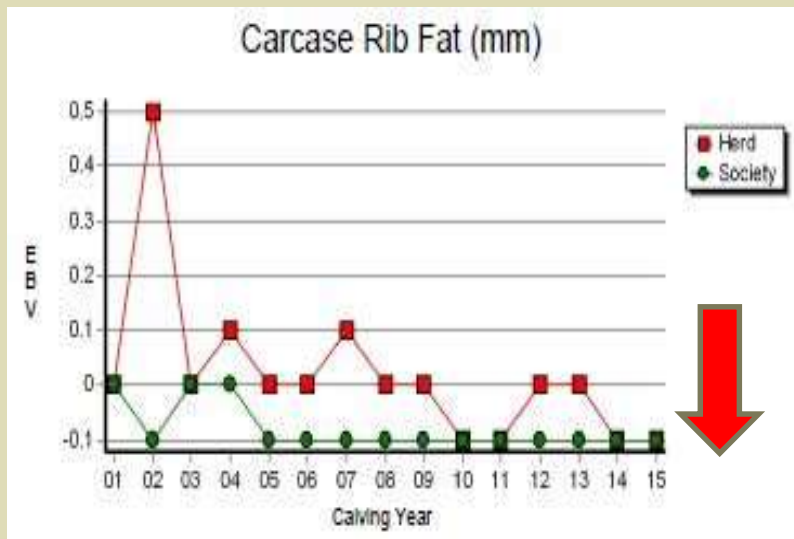
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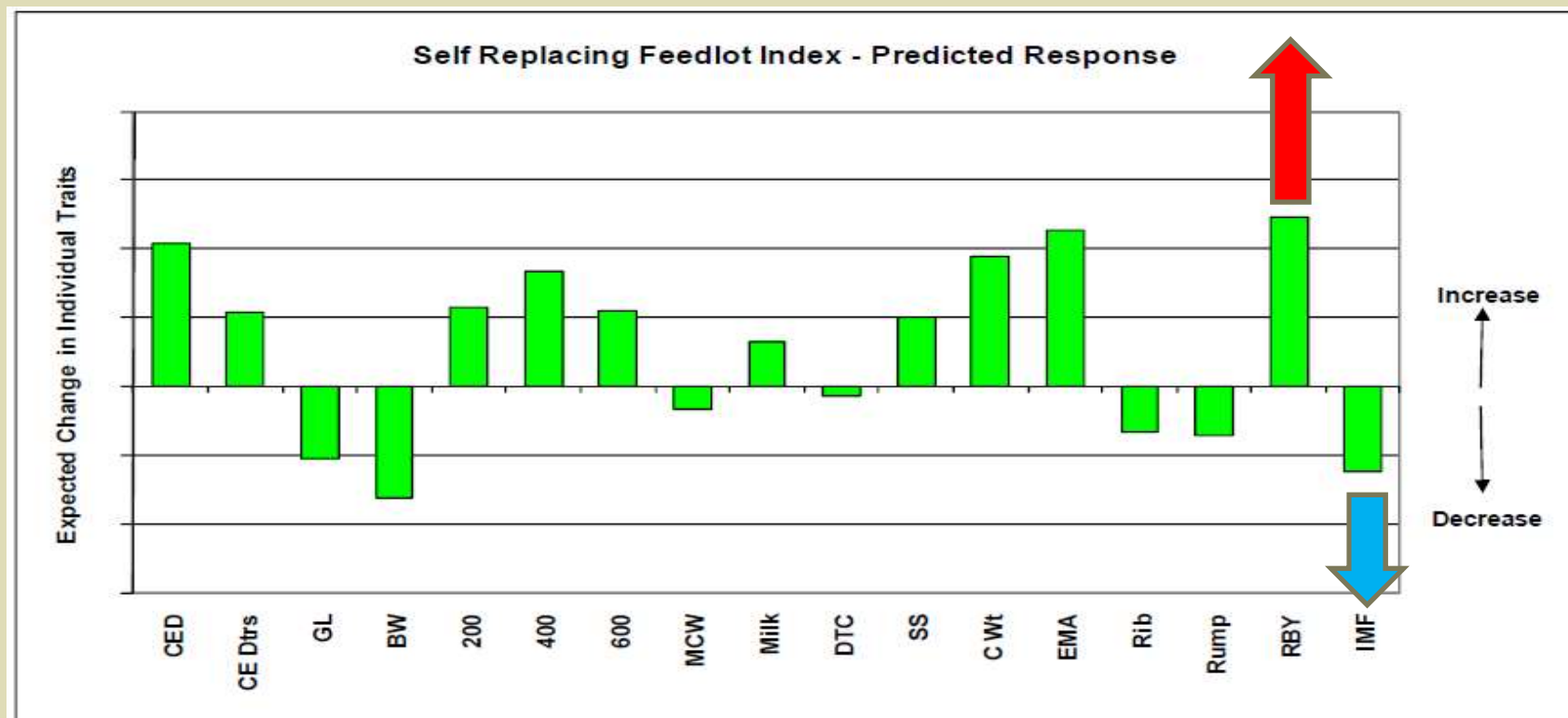
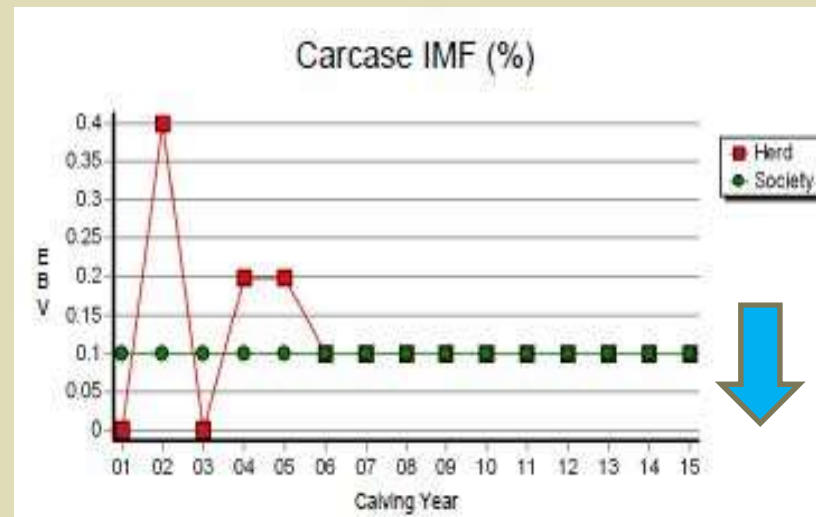
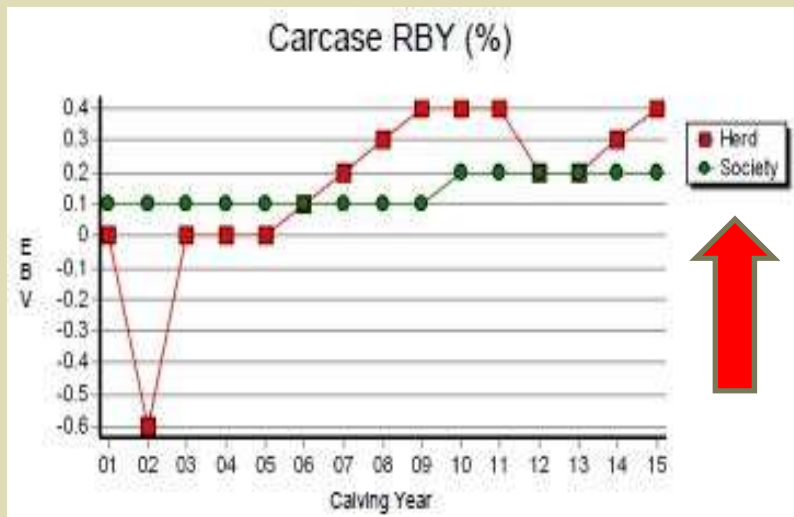
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Benchmarking BTB Simmentaler

June 2016 South African Simmentaler GROUP BREEDPLAN EBVS - Percentile Bands for all 2014 born animals

Use this table as a guide to compare individual animals with the current genetic level of the breed

	Calv-Ease		Birth		Growth					Fert		Carcase						Indexes		
	Dir	Dtrs	GL	Bwt	200	400	600	Mwt	Mik	SS	DC	Cwt	EMA	Rib	Rump	RBV	IMF	SF	SG	TS
	%		days				kg			cm	days	kg	sq.cm	mm		%			R	
High 1%	+7.8	+6.2	-2.5	-1.0	+25	+41	+51	+58	+9	+1.1	-3.2	+29	+1.6	+0.3	+0.6	+0.9	+0.3	+106	+181	+216
High 5%	+5.4	+4.5	-1.8	-0.1	+23	+36	+45	+50	+8	+0.8	-2.1	+26	+1.1	+0.2	+0.3	+0.3	+0.3	+86	+150	+187
High 10%	+4.1	+3.5	-1.5	+0.3	+21	+33	+42	+46	+7	+0.6	-1.6	+24	+0.9	+0.1	+0.4	+0.5	+0.2	+75	+133	+172
High 15%	+3.3	+2.9	-1.3	+0.5	+20	+31	+39	+44	+7	+0.6	-1.3	+22	+0.7	+0.1	+0.3	+0.5	+0.2	+68	+123	+161
High 20%	+2.7	+2.5	-1.1	+0.7	+19	+30	+38	+42	+6	+0.5	-1.0	+21	+0.6	+0.1	+0.3	+0.4	+0.2	+62	+115	+153
High 25%	+2.2	+2.1	-1.0	+0.9	+18	+29	+36	+40	+6	+0.5	-0.8	+21	+0.5	+0.0	+0.2	+0.3	+0.2	+58	+109	+147
High 30%	+1.8	+1.8	-0.9	+1.0	+18	+28	+35	+38	+6	+0.4	-0.7	+20	+0.5	+0.0	+0.2	+0.3	+0.2	+54	+104	+141
High 35%	+1.4	+1.5	-0.8	+1.2	+17	+27	+34	+37	+5	+0.4	-0.6	+19	+0.4	+0.0	+0.2	+0.2	+0.2	+51	+100	+136
High 40%	+1.0	+1.3	-0.7	+1.3	+17	+26	+33	+35	+5	+0.3	-0.4	+19	+0.3	+0.0	+0.1	+0.2	+0.2	+48	+96	+131
High 45%	+0.6	+1.1	-0.6	+1.4	+16	+25	+31	+34	+5	+0.3	-0.3	+18	+0.3	-0.1	+0.1	+0.2	+0.1	+45	+92	+126
50%	+0.3	+0.6	-0.5	+1.5	+16	+24	+30	+32	+5	+0.3	-0.2	+17	+0.2	-0.1	+0.1	+0.1	+0.1	+43	+88	+122
Low 45%	-0.1	+0.6	-0.4	+1.6	+15	+23	+29	+31	+4	+0.2	-0.1	+17	+0.2	-0.1	+0.1	+0.1	+0.1	+40	+85	+117
Low 40%	-0.4	+0.4	-0.3	+1.7	+15	+22	+28	+30	+4	+0.2	-0.1	+16	+0.1	-0.1	+0.0	+0.1	+0.1	+37	+81	+113
Low 35%	-0.8	+0.1	-0.2	+1.9	+14	+21	+27	+28	+4	+0.1	+0.0	+16	+0.1	-0.1	+0.0	+0.0	+0.1	+35	+77	+108
Low 30%	-1.2	-0.2	-0.1	+2.0	+13	+21	+26	+27	+4	+0.1	+0.1	+15	+0.0	-0.2	+0.0	+0.0	+0.1	+32	+74	+103
Low 25%	-1.6	-0.5	+0.0	+2.1	+13	+19	+24	+25	+3	+0.0	+0.2	+14	+0.0	-0.2	-0.1	+0.0	+0.1	+29	+70	+98
Low 20%	-2.1	-0.9	+0.1	+2.2	+12	+18	+23	+23	+3	+0.0	+0.4	+14	-0.1	-0.2	-0.1	-0.1	+0.1	+26	+65	+91
Low 15%	-2.7	-1.3	+0.3	+2.4	+11	+17	+21	+21	+3	-0.1	+0.5	+13	-0.2	-0.2	-0.1	-0.1	+0.0	+22	+60	+84
Low 10%	-3.4	-1.8	+0.4	+2.6	+10	+15	+19	+18	+2	-0.2	+0.7	+12	-0.3	-0.3	-0.2	-0.2	+0.0	+17	+53	+74
Low 5%	-4.6	-2.6	+0.7	+3.0	+8	+12	+16	+13	+1	-0.4	+1.0	+10	-0.4	-0.3	-0.3	-0.2	+0.0	+10	+43	+62
Low 1%	-6.9	-4.0	+1.4	+3.7	+5	+7	+8	+5	-1	-0.8	+1.7	+6	-0.7	-0.5	-0.5	-0.4	-0.1	-4	+21	+35

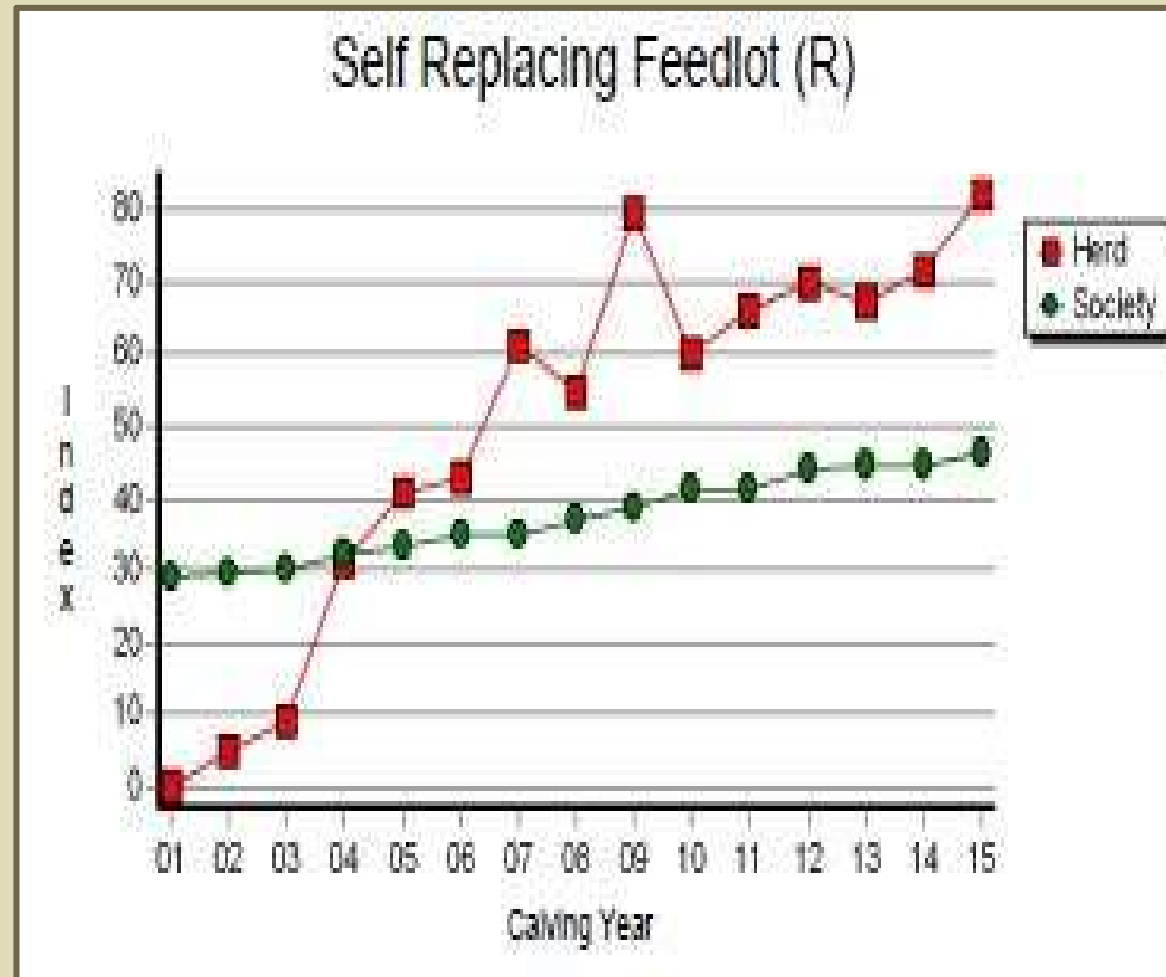
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BTB Simmentaler Progress

The Simmentaler Breed has improved the \$SRF Index by R1.10/yr over the last 11 years.

BTB achieved a average rate of genetic gain of over R 4.64/yr over the same period (+/- 400% better than the breed)

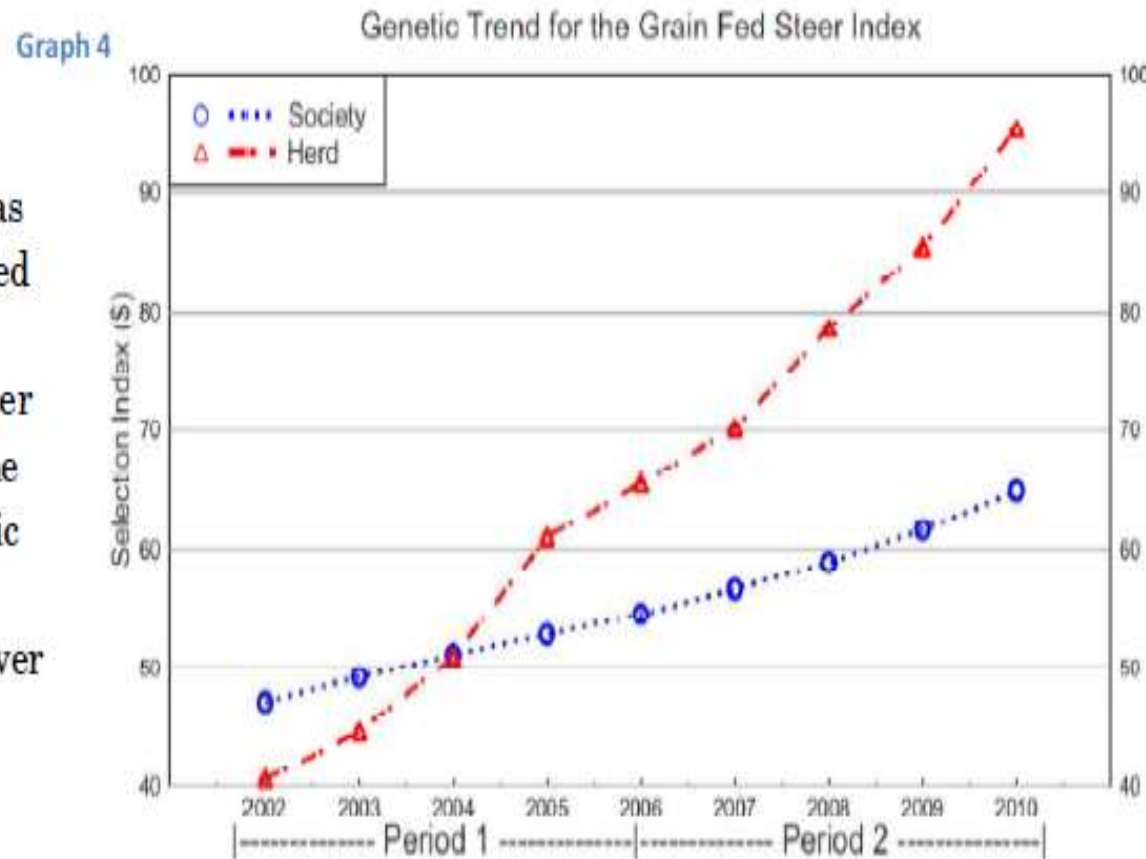


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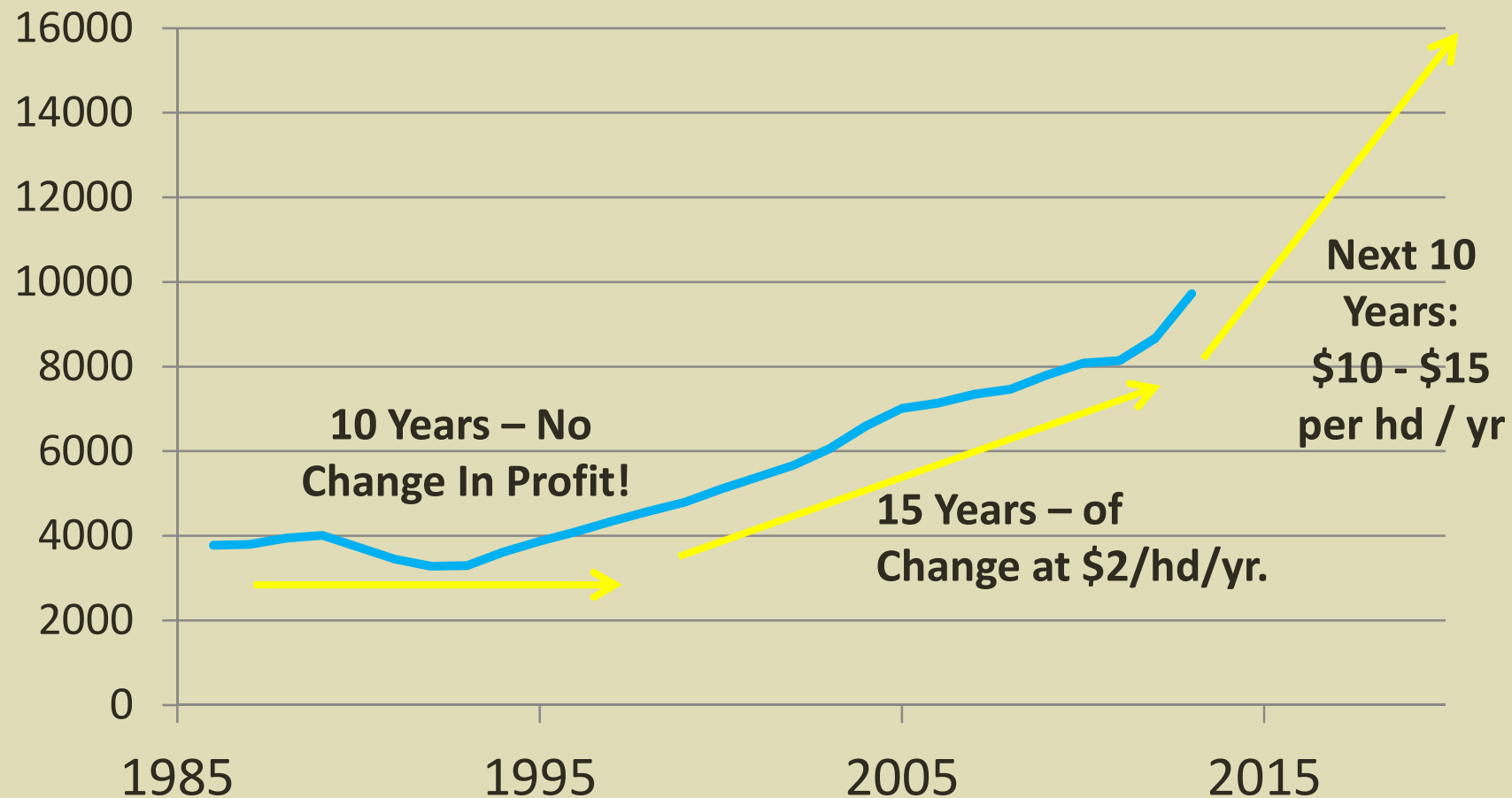
WIRRUNA HEREFORDS PROGRESS

The Hereford breed has improved the Grain Fed \$Index by around \$2.14/cow mated/yr over the last 10 years. The Wirruna rate of genetic gain over the same period has averaged over \$7/cow mated/yr.



How Fast Can We Improve?

Leachman: \$Profit Genetic Trend



**"In God we trust, all others
must bring data."**

W. Edwards Deming



Thank you

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Typical herd EBV profile



	Calving Ease DIR (%)	Calving Ease DTRS (%)	Gestation Length (days)	Birth Wt. (kg)	200 Day Wt (kg)	400 Day Wt (kg)	600 Day Wt (kg)	Mat Cow Wt (kg)	Milk (kg)
EBV	-2.2	-0.4	+0.5	+3.3	+10	+21	+22	+24	+6
EBV	+0.3	+0.9	-0.6	-1.5	+15	+24	+30	+32	+5



Breeding Objective

Characteristics In Breeding Objective

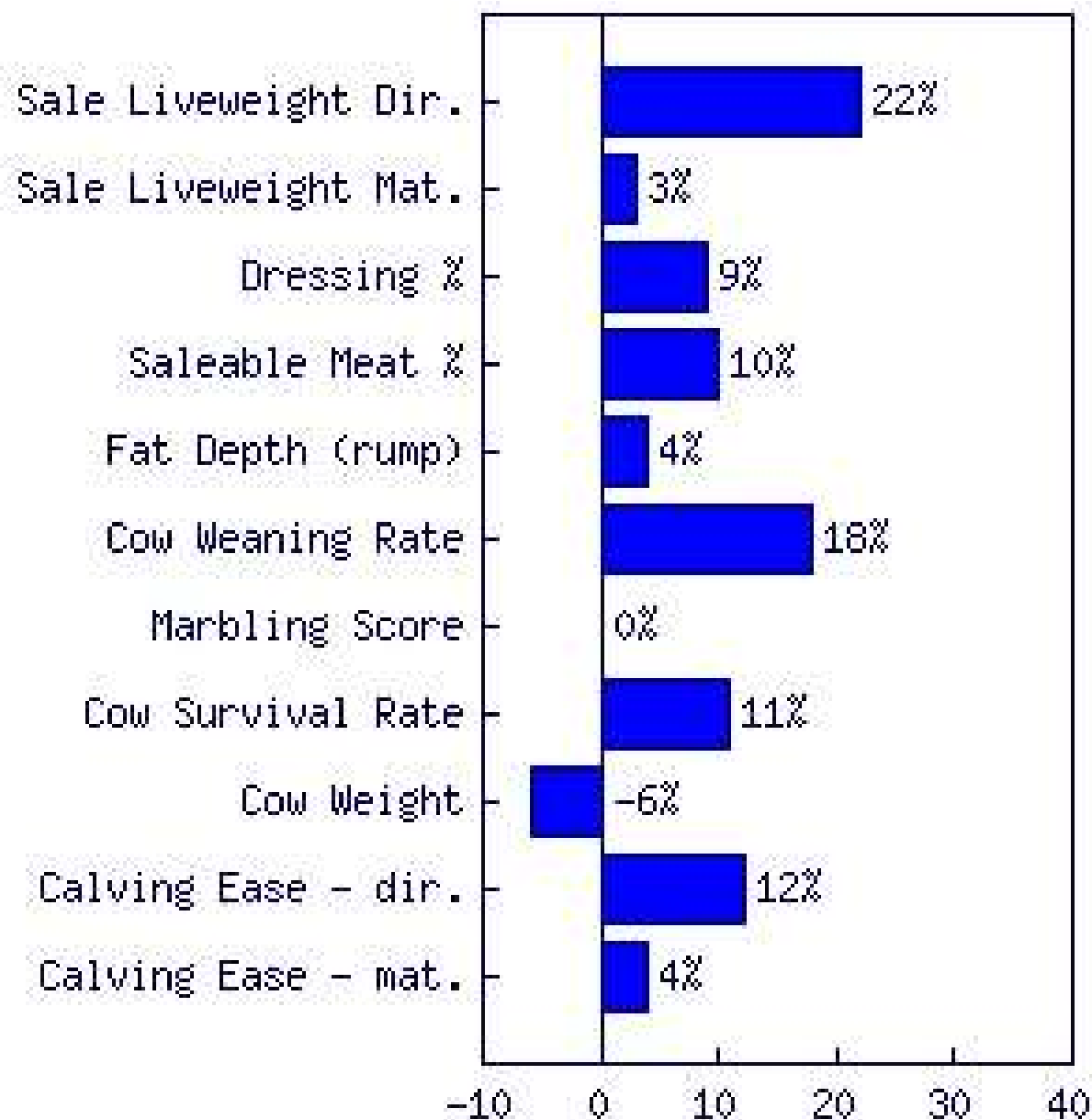
- Calf Survival (wean rate)
- Weaning weight
- Male/female Fertility
- Longevity
- Milk production
- Feed efficiency

Traits in Selection Index

- CED EBV
- CEM EBV
- WW EBV
- YW EBV
- Milk EBV
- MCW
- DTC



Economically relevant trait importance of Extensive Rangeland Grazing Index



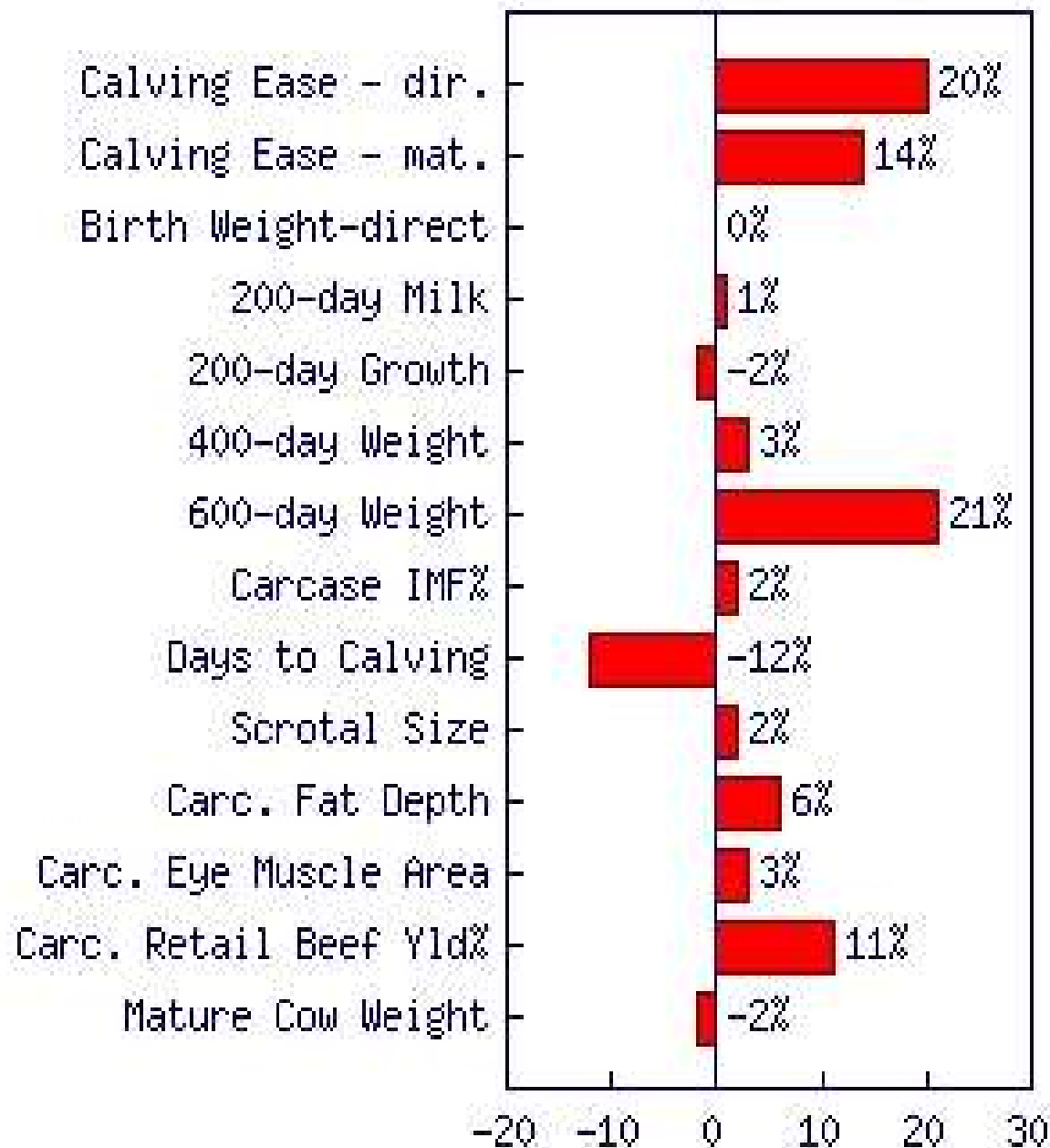
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EBV composition of Extensive Grassland Index



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