



## *The Nuts & Bolts of Composite Breeding*

A few things composite  
breeders should know

Sally Buxkemper SimSeminar April 18, 2006



## *What is a composite?*

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- Composites are populations formed by combining two or more existing breeds or genetic pools, followed by some inter-se mating and possibly some re-creation. Matings are planned to try to avoid inbreeding in order to maintain valuable heterosis.



## *Open vs. Closed*

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- Some American “breeds” are open and some do not allow recreation- only upgrading.
- The open types like Simbrah and Brangus can preserve more heterosis.
- The more breeds or “pools” in a composite, the easier it is to maintain valuable heterosis.



## *Why make composites?*

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- Crossbreeding systems are difficult to maintain.
- Designed composites take advantage of genes present in different populations to make a better product and animal.
- Once formed, management is similar to managing a single breed.



## *Linkage*

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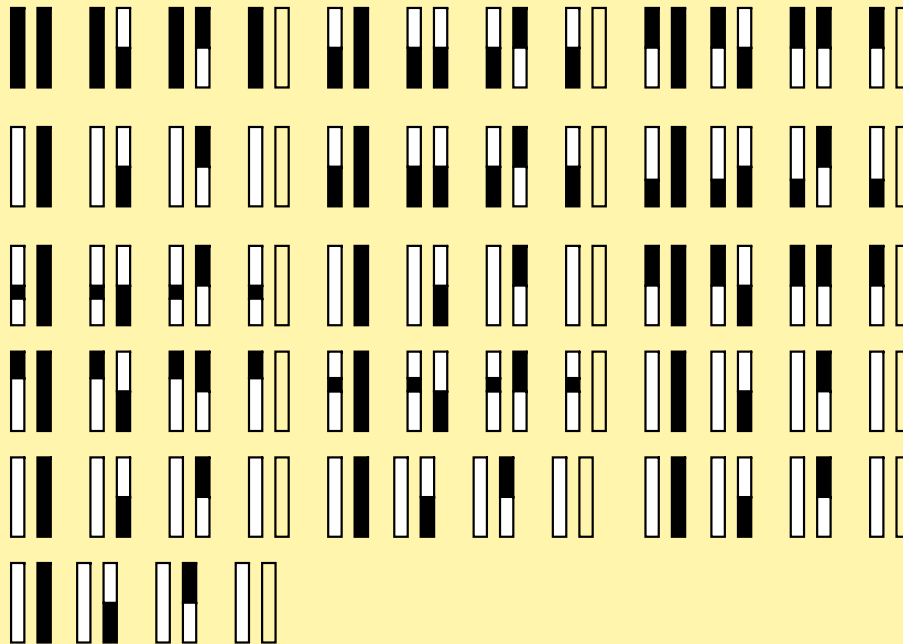
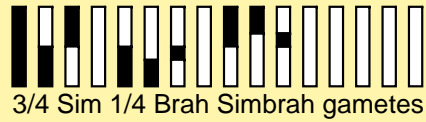
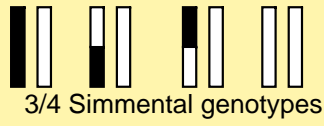
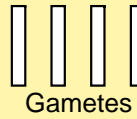
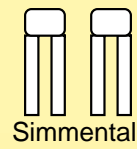
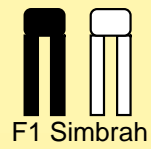
- Genes on the same chromosome are Linked. Crossover in multi-generation breeding puts genes from different foundation animals on the same chromosome.
- However, genes that are close together resist recombination and tend to stay together.



- The following slide shows one pair of chromosomes in a cross between a  $\frac{3}{4}$  SM  $\frac{1}{4}$  BR with an F1 to make a  $\frac{5}{8}$  SM  $\frac{3}{8}$  BR Simbrah.
- You can see that not all the progeny get  $\frac{5}{8}$  of the genetic material from SM and  $\frac{3}{8}$  from Brahman.



Diagram for Multigeneration Simbrah



One pair of chromosomes from first generation purebred Simbrah produced from a mating of a 3/4S 1/4B parent with a 1/2S 1/2B parent.



- In this example some progeny show all SM or all BR. With 30 pairs of chromosomes, chances of getting all genetic material from one breed is less than winning the Texas Lottery!





## *Tools for genetic solutions*

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- Phenotype-conformation, performance, disposition
- Multi-breed EPDs
- Ultrasonic carcass information
- Progeny information
- DNA marker information for hard to discover traits
- Reproductive information
- Disease resistance or tolerance



- You can put valuable genes into your composite from any source.
- Composite breeding allows you to be creative.



## *Tenderness Example*

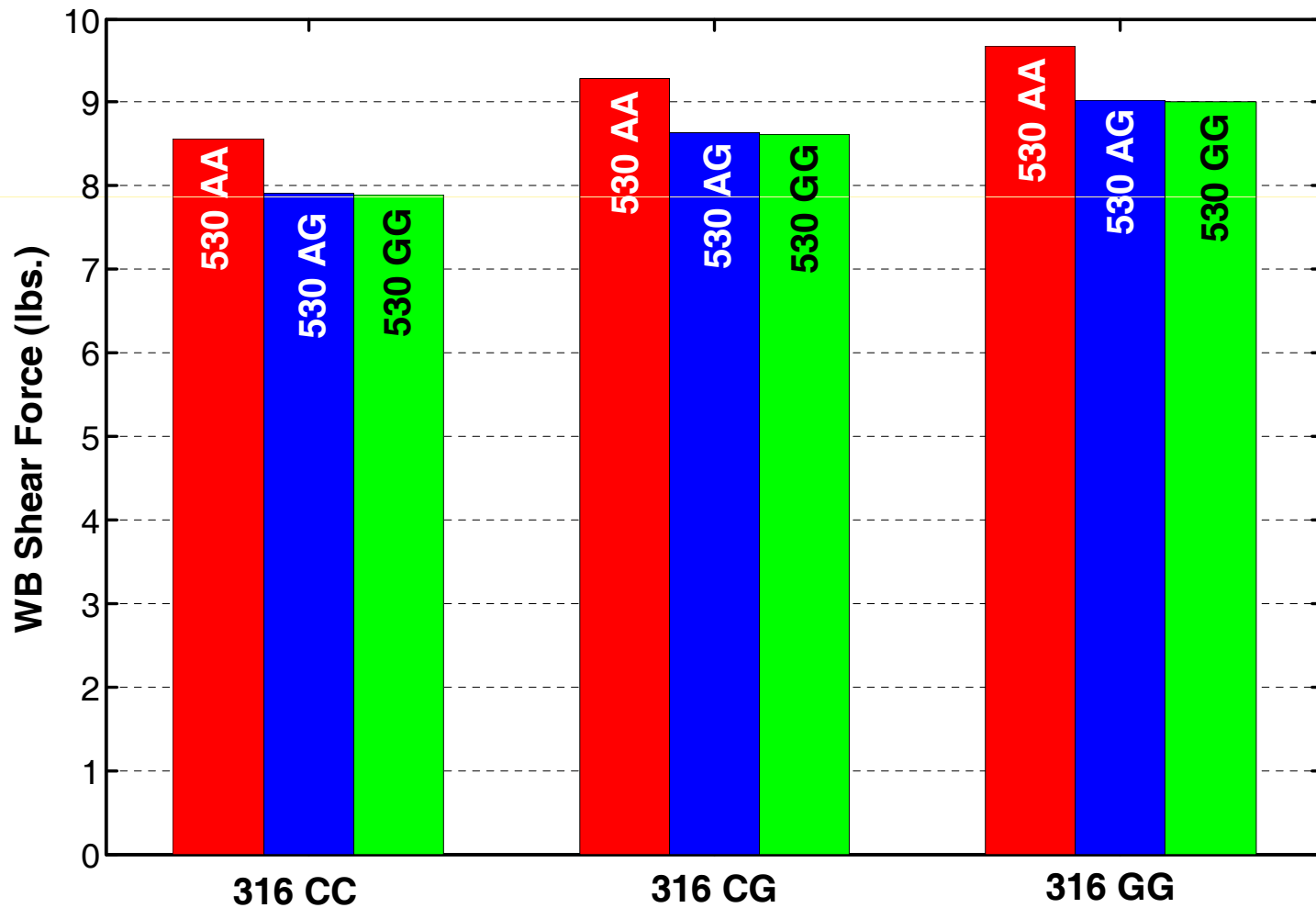
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- With DNA markers you can select easily within your gene pool if you already have the desirable allele.
- Or add alleles from another source or breed that does have the trait.



# *Mu-Calpain: 2 Additive Genotypes*

*R. L. Quaas*





## *RX Simbrah Special Traits*

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- Clean sheath, non prolapsing prepuce and cervix
- Short slick red or wild-type hair coat, polled
- Strongly attached udder, small teats
- Newborn calf vigor
- Early puberty
- Calm disposition
- Quality beef that is tender

# *Components RX Simbrah*





# *RX Simbrah*





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