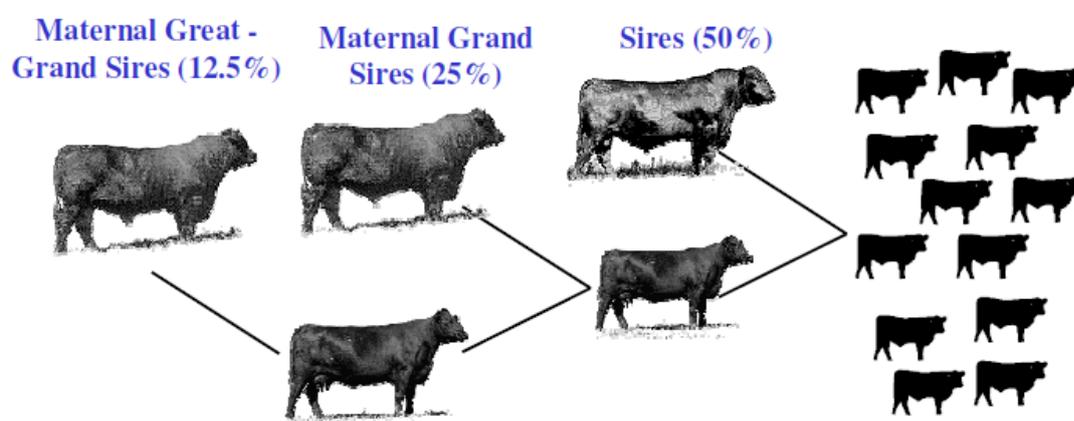


Selecting and managing bulls – genetics, conformation and animal health.

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Choosing the right bull is important. Bulls influence 87% of the genetics in the herd. By choosing bulls with desirable, economically beneficial traits, producers can significantly influence herd outputs in a short period of time. This article is a summary of the key elements of choosing and look after bulls.



87% of genetic composition of calf crop is determined by the sires used over the last 3 generations

Genetics

When choosing a good bull it is important to make the selection based on:

- what can be seen - conformation and health of the bull, and
- what cannot be seen - what's in the genes.

Conformation and health are addressed later. This section discussed genetics. In Australia we have a powerful tool for selecting traits that are desirable in the herd. BREEDPLAN collects literally hundreds of thousands of data points each year specific to particular traits and generates Estimated Breeding Values (EBV) based upon these that are accurate. As with all statistics-based systems, they are only as good as the data that goes in. Fortunately, 25 odd years after its inception, BREEDPLAN is now getting quality data from several registered breeds.

The image below shows the number of record recorded for the various traits that have EBVs in the Angus breed in 2010. The accuracy of an EBV is governed by:

- the heritability of the trait
- genetic associations among traits
- the number of records submitted from the individual
- the number of records submitted from relatives

Trait	Number of records	Adjusted Average
Gestation Length	169,368	281 days
Birth Weight	608,246	36 kgs
200-Day Weight	624,284	240 kgs
400-Day Weight	458,606	371 kgs
600-Day Weight	285,113	519 kgs
Mature Cow Wt (kg)	34,027	609 kgs
Heifer Scan P8 Fat (at 500 days)	155,559	7 mm
Heifer Scan Rib Fat (at 500 days)	155,436	5 mm
Heifer Scan EMA (at 500 days)	155,290	61 sq. cm
Heifer Scan IMF% (at 500 days)	133,795	5 %
Bull Scan P8 Fat (at 500 days)	154,587	5 mm
Bull Scan Rib Fat (at 500 days)	154,739	4 mm
Bull Scan EMA (at 500 days)	154,923	81 sq. cm
Bull Scan IMF% (at 500 days)	128,103	3 %
Carcase Wt (at 650 days)	5,186	347 kg
Carcase Rib Fat (at 300 kg)	1,635	10 mm
Carcase Rump Fat (at 300kg)	3,435	14 mm
Carcase EMA (at 300 kg)	2,502	71 sq. cm
Carcase RB Y% (at 300 kg)	941	67 %
Carcase IMF% (at 300kg)	3,962	6 %
Scrotal Size (400 days)	129,583	35 cm
Days to Calving	229,549	312 days

NB. includes data from Australian herds only

A producer can use an index to customise the suite of EBVs that most suit the targeted production outcomes but more simply, single EBVs are often useful when choosing a bull to best fit a system. For example, choosing a bull to cover heifers one might choose a bull with EBVs for the following traits:

- *low days to calving* – heifer calves will be born with a tendency towards shorter days to calving
- *low birth weight* – low birth weight EBVs will help manage the incidence of dystocia
- *average 200 day weight* – aim for average or above which would select for calves that grow fast until weaning
- *average P8 fat* – will produce calves with a degree of robustness but are not over fat or too lean

The topic of selection is a big one and these notes are not designed to cover it in its entirety. Courses are available for those who want to learn more. The key messages regarding genetics are:

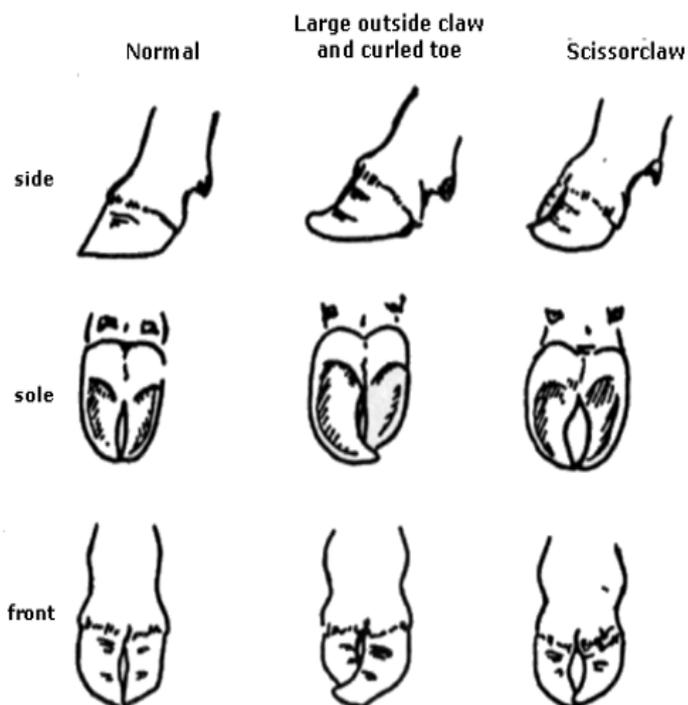
- EBVs are very powerful and often remarkably accurate
- producers can choose bulls whose progeny best suit the production targets
- EBVs can be used to minimise dystocia, certainly far more significantly than looking at the conformation of the bull itself.

Conformation

Certain things cannot be captured by genetics (yet). These include the “shape” of the animal. There are certain things that are associated with problems in bulls and care should be taken to choose bulls without any “shapes” that are extreme as they invariably cause problems. The most concerning thing with regard to “shape” issues is that they are often heritable issues that then appear throughout the breeding herd. The following is a brief summary of the main conformational problems in bulls.

Feet

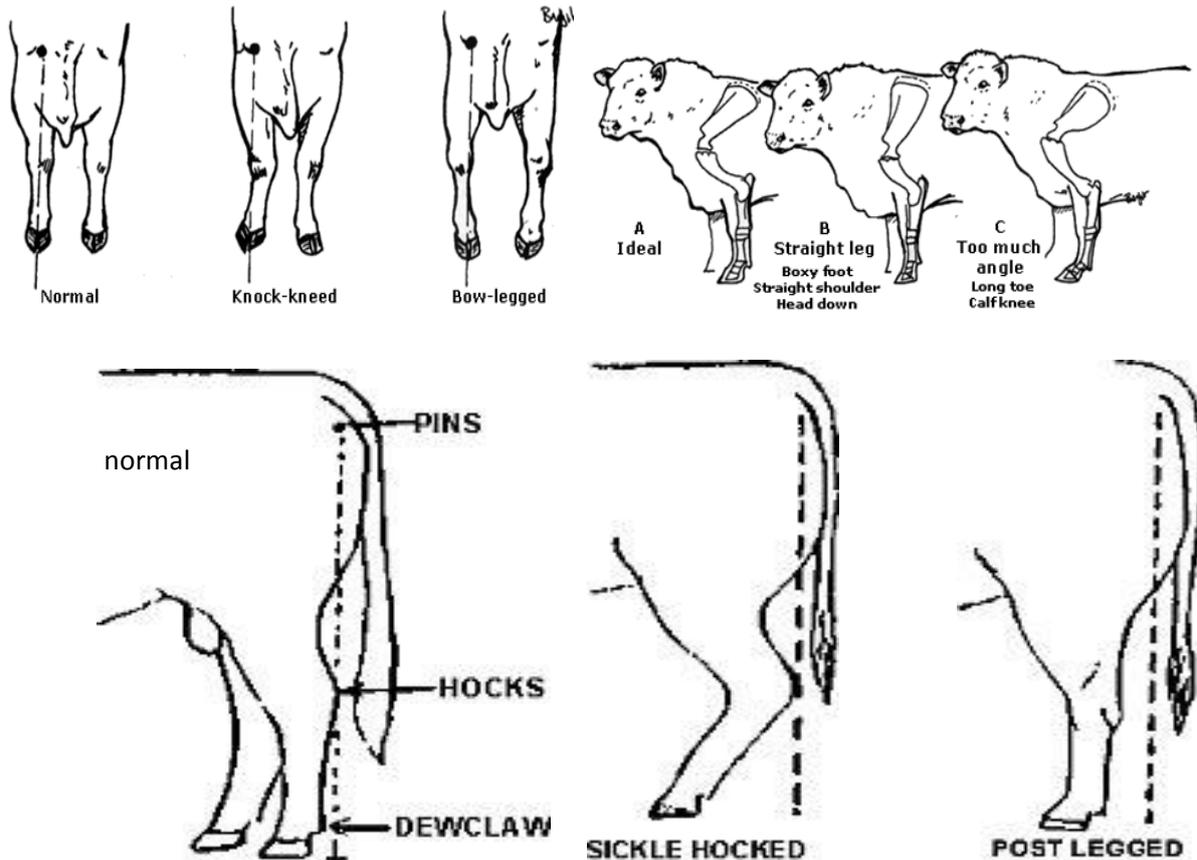
Foot problems are serious in bulls. Bulls are heavy and need to stand on their two hind legs to mate. Claws should be about 8cm long with a hoof-pastern axis of 45 degrees or there is significant extra pressure on flexor tendons and internal support structures. Again – **bad feet in bulls translates to bad feet, and therefore lameness, in the breeding herd.** Cows must be able to walk to eat and breed – their two most important jobs.



Foot care in bulls is important too. Overgrown claws, cracks and fissures as well as foot abscess and separated claws all benefit from the appropriate trimming or treatment, the sooner the better. Bulls must be able to walk to do their job properly. 80% of lameness in cattle is foot-related and often avoidable. A lame bull need not be a cull bull but early intervention is the key.

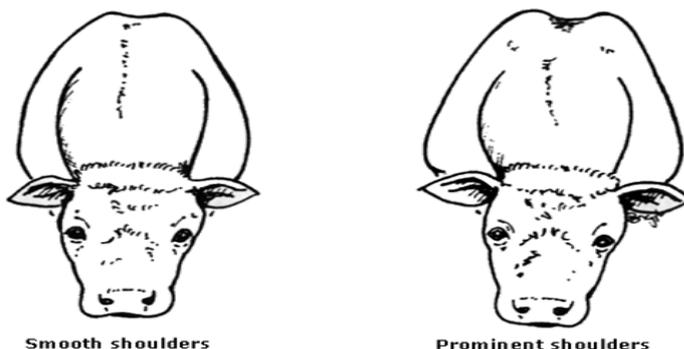
Legs

Some leg shapes are undesirable, particularly straight hocks. This shape puts massive extra strain on stifle joints which are the joint that is commonly injured in bulls. In fact any leg abnormalities in one way or another put extra stress on legs under the heavy load of a serving bull.



Shoulders and tail-set

The shoulders of a bull should not be too prominent and narrower than the pelvis. Also, high-set tails should be avoided because they produce cows with forward tilting pelvises. This effectively narrows the opening of the pelvis. All three of these shapes contribute to the incidence of dystocia.



Body condition

Bulls should ideally be in body condition score 3 at the time of mating. This means they have good muscle coverage as well as a about 4-7mm of fat over the P8 site. Because bulls are muscular there is a tendency to overestimate body condition. Many of the bulls I examine are not in adequate body condition to cope with the arduous breeding season in front of them. To change a bull from condition score 2 to 3 they need to put on over 100kg and require significant feeding for about 3 months pre the mating season.

Animal Health

As a vet it might be said that of course I would advocate a pre-mating, breeding soundness examination (BBSE) of every bull, every year. I accept that argument but stand by the statement. A thorough check of each bull, each year, will regularly identify issues that can either be solved easily or will save the producer using a defective bull for the duration of the breeding season only to be confronted with poor pregnancy rates. BBSE are relatively quick but thorough.

The components of the BBSE are

- identification – ear tag, brand, tattoo, markings
- physical exam – temperature and respiration, health of eyes, ears and mouth, body condition score
- conformation – check of feet, legs hips and shoulders
- genital exam – scrotal and penis palpation and measurement
- semen test – usually by electro ejaculation examining semen colour, density, wave motion, motility and morphology
- serving ability (not always done) – can a bull jump, achieve intromission, ejaculate and withdraw?

There are also specific diseases that affect bulls and can cause low reproductive rates in cows. These include:

Pestivirus – this disease is complex and has its most significant impacts on unborn calves or in feedlot. Notably though, relatively normal looking bulls can be persistently infected with the disease, meaning they can spread it through the herd, sometimes with devastating consequences. It is easy to both test for and vaccinate against pestivirus. The purchase of any new bull should be associate with both.

Key points regarding pestivirus

- the disease causes massive production loss, mainly through low pregnancy rates or birth deformities
- bulls can be persistently infected carriers of the disease
- there is an effective vaccine available for use in the breeding herd prior to joining
- new bulls should be tested for PI status before use in the breeding herd

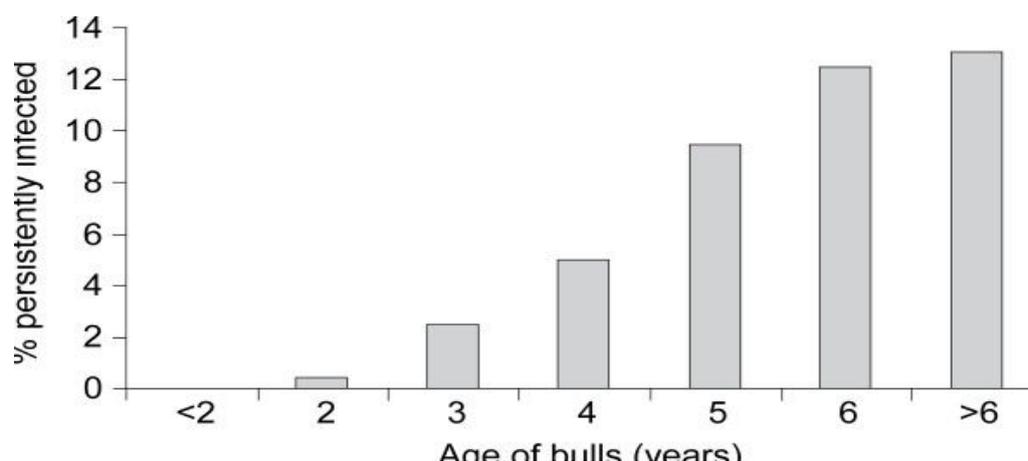
Campylobacteriosis – or vibriosis. This bacterial infection of bulls causes early abortion in cows. The bacteria live in the folds of the penile mucosa and are transferred to the vagina and uterus of cows during mating. Here they cause a low grade inflammation of the uterus which causes embryo death. Cows will eventually become immune but can also become carriers. In this case they can pass the bacteria on to virgin or clean bulls which will go on to infect other herds.

Bulls can be vaccinated against the infection. A double dose of vaccine will also usually cure a bull of his infection. There is a commercial test available to test both bulls and cows for vibriosis.



Key points regarding Vibriosis

- the disease causes embryo loss in cows and manifests as high non-pregnant rates at preg-testing
- bulls are the carriers but can become infected from infected cows
- there is an effective vaccine available for bulls
- new bulls should be tested or vaccinated twice before us in the herd.
- older bulls are more likely to be carriers (persistently infected)



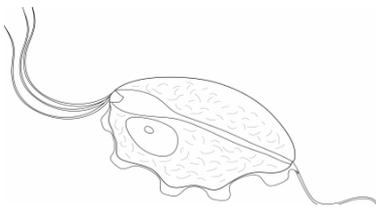
after (Parkinson *et al.*, 2010)

Trichomoniasis. This is protozoan parasite of the genital tract that can also be spread by bulls through the breeding herd. It too causes embryo death and manifests as low pregnancy

rates. It is not common but worth mentioning because there is a test available to test new bulls. Infected bulls should be culled because although they can shed the infection they can also become carriers. Infected cows will recover eventually but usually only after the end of the breeding season and are therefore culled before the next joining. This disease can cause significant loss of production and genetics.

Key points regarding Trichomoniasis

- infected bulls spread the organism to cows
- it causes embryo loss and low pregnancy rates
- there is a test available to test new bulls
- infected bulls should be culled
- there is no vaccine or treatment



General health issues – bulls should be treated with an anthelmintic once a year at the same time as breeders. It is a good idea to vaccinate young bulls with 5/1 vaccine to protect against Clostridial infection.

For any more information on these notes or the presentations please contact me any time.

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