



SECTION

06

## SELECTING A BULL - PHYSICAL ATTRIBUTES

## Breeding soundness

Herd fertility has a major impact on returns in a commercial beef herd. In economic terms, a 1% increase in herd fertility is equivalent to approximately a 10% rise in growth rate.

Fertility within a herd is influenced by four major factors:

- Reproductive soundness of bulls
- Structural soundness
- Management
- Genetics

Examining bulls for breeding soundness is a key aspect of herd fertility. This should be completed before each breeding season and will detect most bulls with potential fertility problems. This examination should be performed by a veterinarian each year.

### FERTILITY PHYSICAL EXAMINATION

This will cull bulls with undesirable physical characteristics or abnormalities that will inhibit its key job of mating cows. This basic examination can be done by eye at a bull sale. Further tests that make up a BBSE (Bull Breeding Soundness Evaluation) is completed by a veterinarian. This includes a service capacity test, libido assessment, scrotal size/palpation and semen quality test. Some breeders will provide a BBSE on all bulls before sale.

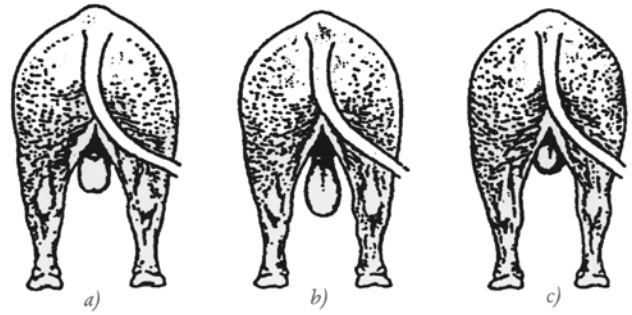
#### Scrotum and testes

Bulls with straight-sided scrotums often have only moderate testicle sizes. The straight-sided neck of the scrotum is generally due to fat deposits that can impair proper thermoregulation, particularly in the summer. This is often a result of feeding. Such fat deposits may disappear as a bull grows.

Bulls with normally shaped scrotums (which have a distinct neck) are preferred. Testes are located in the scrotum because sperm can only be produced within a narrow temperature range, several degrees cooler than internal body temperature. To maintain semen quality, effective thermoregulation must occur and can only be achieved from 'normal' testes.

Wedge-shaped scrotums are pointed towards the bottom and tend to hold the testes close to the body wall. Bulls with this scrotal configuration have undersized testes that seldom produce semen of adequate quality and should be avoided.

Scrotal shapes encountered in beef bulls



- Straight-sided scrotum.* This shape is usually due to a fat-pad at the base of the scrotum, which can interfere with testicular thermoregulation. Testicles in a straight-sided scrotum are frequently only moderately sized.
- Normal scrotum.* Note the definite neck. Large sized testicles are more frequently found in a normal-shaped scrotum.
- Wedge shaped scrotum.* Testicles in a pointy scrotum are held too close to the body and are most often undersized.

It is useful to palpate (handle and examine) the scrotum and testicles, noting position and consistency; but this is not usually possible, at a bull sale. Palpation should be carried out by an experienced person.

#### Scrotal size

Scrotal size is important for the following reasons:

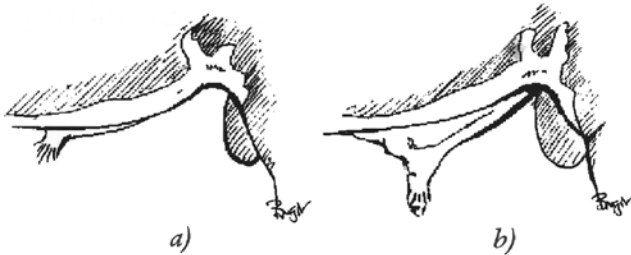
- In conjunction with a bull's serving capacity, it influences the number of cows he can successfully mate during a breeding season (mating potential)
- A key indicator of when a bull reaches puberty
- Positively related to the age at which female relatives reach puberty
- Positively linked to later female fertility
- Influences semen quality

Scrotal size measurements taken in a large experimental herd in Queensland, Australia, showed a positive link between scrotal size and female fertility applied at any age between 12-20 months. Bulls with larger scrotal size at puberty had daughters that conceived earlier in their lives and returned to calf earlier resulting in a more productive lifetime. Cattle that mature reproductively early are always preferred.

## Penis and sheath

The sheath should be firm, but not tight to the belly, of moderate length and angled forwards when both flaccid and erect. Injuries - like prolapse or legions - that have become inflamed should be identified. This will predispose the bull to further injury or an inability to serve cows at mating.

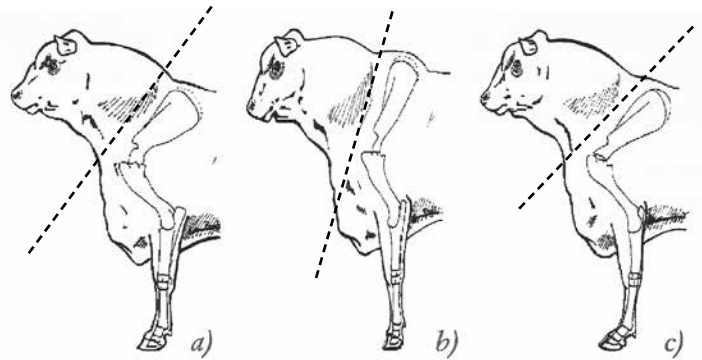
Bulls with other obvious abnormalities should be culled. Corkscrew penises are a major cause of poor in-calf rates in cow herds and seriously limit a bull's ability to serve.



### Sheath

a) Desirable sheath b) Loose, undesirable

**Shoulders:** The shoulders are naturally sloping. A slope of 45-60 degrees is considered acceptable. A beast whose shoulder blade is tipped forward (straight shouldered) has less angle at the shoulder joint and elbow joint. This reduces the shock-absorbing ability of these front joints.



### Front leg and shoulder structure of the bull

a) Correct b) Too straight c) Too much angle

## STRUCTURAL PHYSICAL EXAMINATION

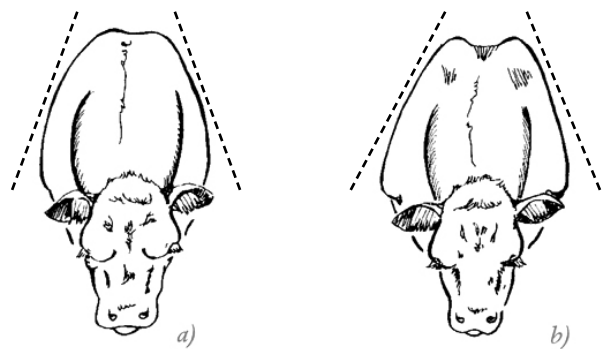
While a bull's fertility is the most important of his traits, he must be sound in his structure so that he lasts many years, serving many cows in a short period of time, without suffering injury. Structural soundness is therefore an integral part of this fertility.

**Jaw:** The jaw should be wide, enabling the animal to harvest its daily food requirements in as short a time as possible. The teeth on the lower jaw should meet squarely with the upper pad. Bulls with overshot jaws (lower jaw protruding) and undershot jaws may have difficulty grazing, especially when pasture is short.

**Eyes:** Some breeds are very susceptible to eye cancer. Eye cancer is a serious condition leading to wastage in cattle and possible downgrading of the carcass. It can be minimised by ensuring that animals are well pigmented around the eyes, have eyes which are well set into the head, and have a well "hooded" forehead. Susceptibility to eye cancer is a heritable trait.

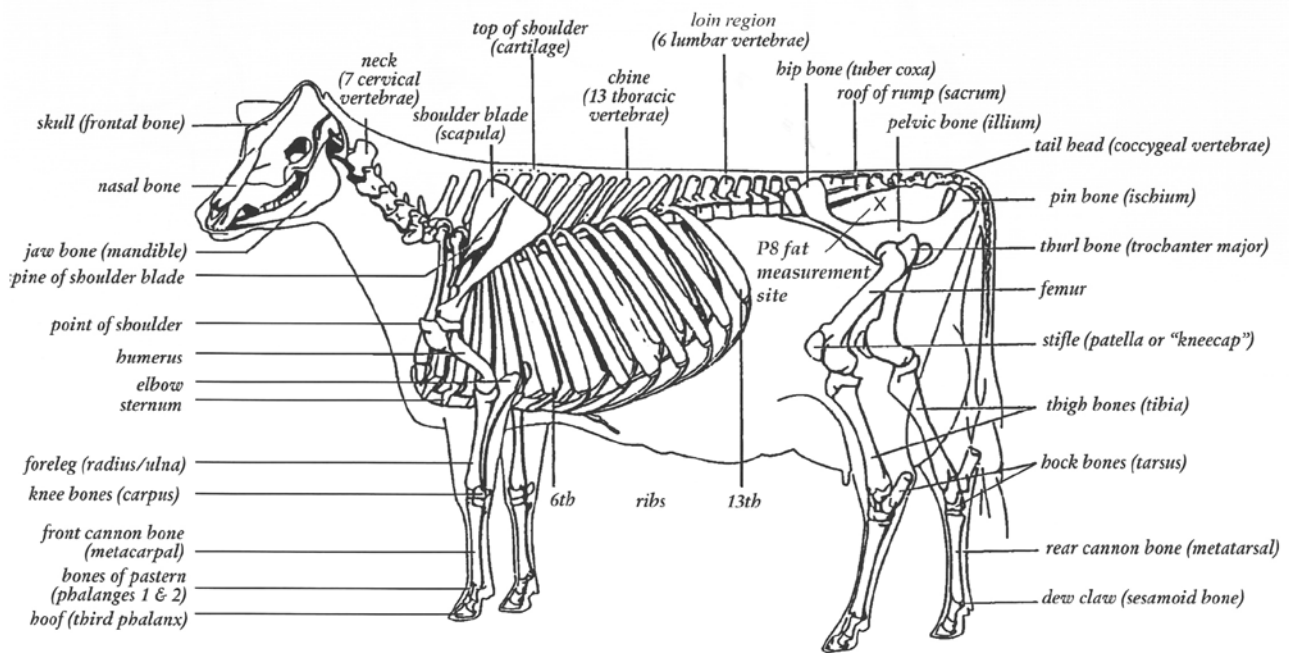
**Neck:** The neck should appear to be of a reasonable length and held high. Often, the neck appears to be short because there is too much angle to the shoulder and the point of the shoulder pushes forward into the neck region (refer to Bull C on shoulder structure illustration). If the head and neck are held low, this can indicate the shoulder is too straight (see Bull B).

The shoulder should lie smoothly against the rib cage. Bulls whose shoulders are wide at the point of the shoulder (the base of the neck) or wide between the shoulder blades (when observed from above) may throw heavily-shouldered calves. This increases the chance of calving problems.



### Prominent shoulder blades may increase calving difficulties

a) Smooth shoulders b) Prominent shoulders



**Front legs and feet:** The front legs of the bull should be straight when viewed from in front. On a structurally sound animal, you can draw a vertical line from the point of the shoulder to the middle of the claw. This line should intersect the knee. As the knee joints carry more than half the bull's body weight, deviations from this line will cause excessive wear in these joints.

A 'knock-kneed' bull may have turned out front feet (up to 10 degrees is considered normal). A bull is considered knock-kneed when the knee joints lie inside this line, which may eventually lead to overgrown outside claws.

A bull that is wide at the knees (bow-legged) presents a more serious problem. These animals are often narrow in their stance and may roll their feet as they walk. They can also be wide in their shoulders.

From the side, the foreleg and cannon bones should be in a straight line. The knee joint forward of this line (buck-kneed) can be associated with steep shoulders and pasterns and may be a serious fault.

The way the claws of the feet grow often indicates structural problems higher up the legs.



**Front leg structure**

a) Normal b) Knock-kneed c) Bow-legged

Long or excessively short, even claws may indicate too much or not enough pastern angle, causing both claws of the hoof to grow or wear excessively. Overgrown claws affect the mobility and performance of the animal.

The figure below indicates the correct angle of the pastern joint. Uneven wearing of the two claws, where one grows longer than the other, is often due to a problem in the leg structure. It is caused by an uneven distribution of weight through the foot.



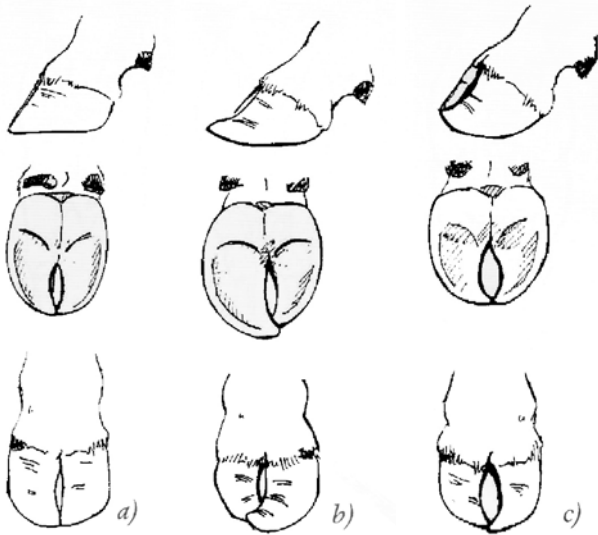
**Pastern angle of front and hind legs**

a) Correct b) Too much angle c) Too straight

If the claws curl across each other without growing long, this may indicate a serious genetic fault known as 'scissor claw'. These cattle wear the back of the hoof, causing lameness and reduced mobility.

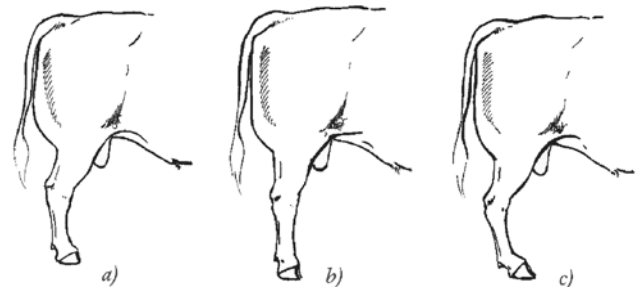
Where excessive claw growth is caused by things other than structure (soft soil, heavy grain feeding, lack of exercise), extra pressure is placed on the leg joints - eventually causing lameness.

**Feet:** Avoid overgrown, scissor or curved claws. Mild curling is normal. It is exaggerated by heavy feeding and soft soils. Overgrown, uneven claws usually indicate poor limb structure or early signs of hip arthritis. Avoid extremely short feet, which are often associated with over-straight legs.



**Feet**

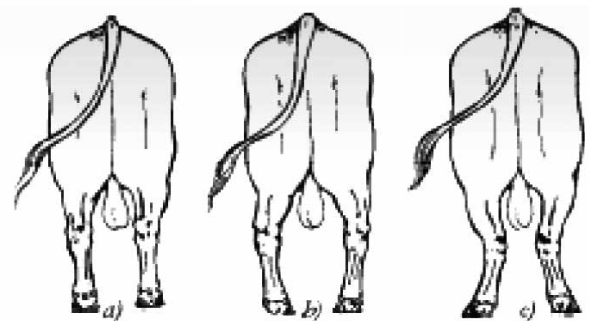
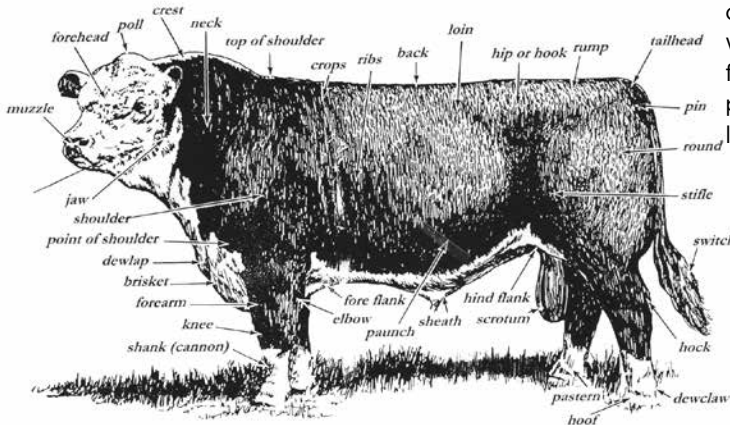
- a) Normal
- b) Large outside claw and long curled toe
- c) Scissor claw



**Hind leg structure, from the side**

- a) Correct
- b) Too straight
- c) Sickle-hocked

Viewed from behind, the tibia and metatarsus (hock joint) should be in a straight line. A bull is 'cow hocked' when the hocks are rotated inwards and the hooves rotated outwards. This may cause problems, but usually only in extreme cases, where uneven pressure on the claws causes the outside claw to grow long. A more serious problem occurs where the legs are wide at the hocks, but the feet are turned in (bow-legged). Extra strain is placed on the ligaments of the hock joints causing lameness and even permanent damage.



**Hind leg structure, from the back**

- a) Correct
- b) Too straight
- c) Sickle-hocked

**Hind legs and feet:** When a bull mounts a cow, he straightens up the joints in his hind legs. When he thrusts, he further straightens the legs. This places enormous stress on all joints, but particularly the hock. If these joints don't have enough angulation, they become swollen and painful, leading to their eventual breakdown.

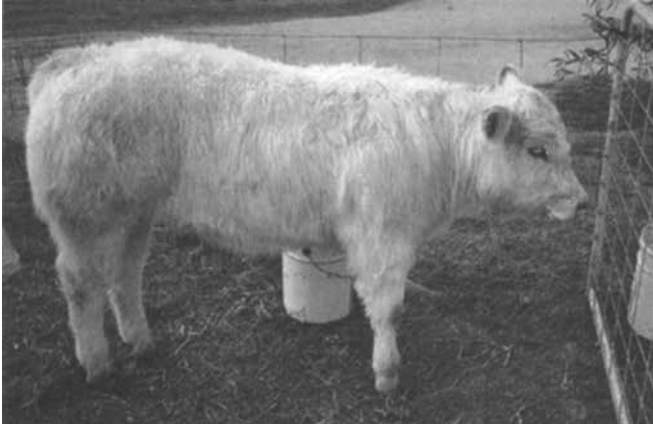
Straightness in the hind leg can be seen in the hock and pastern joints, and this indicates straightness in the stifle and hip. These cattle will wear the front of the claws, resulting in short and upright hooves. Straight-legged bulls are also much less athletic than a sound bull and appear to suffer a higher incidence of broken or damaged penises during serving.

If the degree of the angle in the leg joints is greater than ideal, a 'sickle hocked' condition may exist. This is less of a problem than straight legs, but in extreme cases may cause strained ligaments (pastern and hocks) and long claw growth, increasing the chance of injury and affecting serving ability.

**Mobility:** Where an animal places its feet when walking naturally tells you a lot about its structure:

- A structurally correct animal will place its hind foot in the imprint left by the front foot.
- An animal with sickle hocks will tend to overstep the imprint of the front foot.
- A straight-legged (post-legged) animal tends to place its hind foot short of the imprint of the front foot.

**Temperament:** Flighty or aggressive temperament is a health risk and production cost. Buying bulls that are quiet and settled is important. Temperament is fairly heritable.



**Straight shoulders:** Note the straightness throughout the front leg. Poor structure is often obvious as early as six months, like this bull.



A well placed sheath, lying close up to the body.



**Heavy shoulders:** A bull such as this may increase the chance of calving difficulties.



An excessively long and badly angled sheath, exposing the prepuce and prone to injury.



**Bow legged:** The legs are out at the hocks, placing stress on these joints, and leading to an uneven hoof growth and early breakdown.



**Spiral Deviation 'corkscrew' Penis:** A serious fault preventing full service.





**Low pasterns:** Often associated with sickle hocks, the result will be long hooves and eventual lameness.



A sound commercial bull ready to work.



**Scissor claw:** A very serious genetic fault that causes lameness.



**Uneven claw growth:** Often caused by incorrect structure in the legs.



**Post legged:** The straightness in the stifle and hip. The bull is very prone to breakdown, particularly in the hip joint.



Poppy, unprotected eyes make the bull very prone to eye cancer.



Well set hooded eyes.



**Sickle hocked:** Too much angle in the leg joints seen here in the hock and pastern.

## Beef Class Structural Assessment system

The Beef Class Structural Assessment (BCSA) system is internationally recognised. It is a useful and effective way to classify an animal for structural soundness and basic type measures. Beef class scores stand for an animal at the time of classification only, as structural soundness can change with time and maturity of a given animal. BCSA takes into account all of the structural soundness physical aspects discussed and provides a subjective score that is used in many bull sale catalogues in New Zealand and around the world.

### HOW TO USE

#### For docility:

1 is Ideal (docile); 3 is less ideal (restless); and 5 is aggressive.








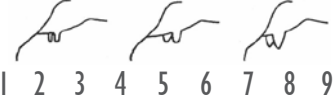


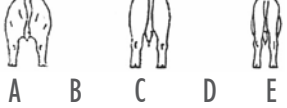
*Scores of 1 and 2 are preferred.*

#### For traits scored 1-9:

- 5 score is ideal
- 4 and 6 show slight variation from ideal, but acceptable in any breeding programme
- 3 and 7 shows greater variation, but would be acceptable in most commercial breeding programmes dependent on the emphasis for that structural aspect
- 2 and 8 are low scoring animals and should be looked at closely before purchasing
- 1 and 9 should not be catalogued and are considered culls

#### For traits scored in 1-5 units:

Higher values are preferred. However, higher values can have other physical consequences (i.e. heavily muscled cattle may have restricted mobility).

Trait	Key	Scoring Range	
Docility	D		1. Docile 3. Restless 5. Aggressive
Front Feet Claw Set Rear Feet Claw Set	FC RC		1. Open/Divergent 5. Good 9. Scissor Claw
Front Feet Angle Rear Feet Angle	FA RA		1. Stubbed Toe 5. Good 9. Shallow Heel
Rear Legs Side View	RS		1. Straight 5. Good 9. Sickle Hocked
Rear Legs Hind View	RH		1. Bow Legged 5. Good 9. Cow Hocked
Front Legs Front View	FF		1. Bow Legged 5. Good 9. Knocked Knee
Udder Evenness	UE		1. Dropped Fore Qtr. 5. Good Balance 9. Dropped Rear Qtr.
Teat Size and Shape	TZ		1. Very Small/Thin 5. Good 9. Very Large/Bulbous
Sheath & Navel Score	SN		1. Pendulous 3. Good 5. Clean/Tight
Capacity	CP		1. Lacking Capacity 3. Medium 5. Large Volume
Muscle Score	LM		A. Very Heavy C. Medium E. Light