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Bull health

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Introduction

The job of the bull is to achieve high conception rates in the breeding herd, and impart genetic gain to the progeny. To ensure this the bull must be kept in top physical condition so that he has the ability to serve large numbers of cows without breaking down, and his semen is always of high quality. It means maintaining the testicles in a healthy state and preventing the risk of temporary infertility through fever.

Importantly, it means having a preventative animal health plan in place for your property, designed in consultation with a veterinarian.

Physical problems

There are many causes of lameness in bulls, including:

- physical injury to the hoof or leg
- poor leg and foot structure and its resulting uneven hoof growth
- disease of limbs and joints.

Although there are a number of causes of joint disease, the resulting inflammation (arthritis) results in reduced ability and desire to serve cows.

Bulls should be managed so as to prevent or delay the onset of arthritis. Things to consider may include:

- preventing the bull from carrying excess weight, caused by too much grain feeding or lack of exercise;
- ensuring mineral balance in the ration – phosphorus deficiency may cause swelling and lameness, as can calcium deficiency (often associated with high grain feeding), particularly if vitamin D and/or vitamin A are deficient;
- preventing bulls from fighting or other physical injury;
- being aware that there is a genetic component – some family lines are more prone to arthritis than others.
- arthritis can also be caused by bacterial infection.

Injuries to the penis and sheath may also prevent the bull from serving. They may cause pain and swelling, and occasionally become infected, preventing the bull from extending the penis.

Prolapse of the prepuce in the bull is also a serious condition causing infertility. It is most common in the *Bos indicus* breeds, but also in some British breeds. Bulls with pendulous sheaths must be watched closely for this problem.

Any form of deviation of the extended penis may affect the bull's fertility by preventing a full service. Premature spiral deviation ('corkscrew' penis) is one of the more common penile defects. It is believed to be an inherited problem mainly affecting polled breeds, and its severity increases as the bull gets older.

Infectious diseases

Diseases affecting the bull can be particularly costly when they affect his fertility or the fertility of the breeding herd. This can result in lower than acceptable conception rates or an extended joining in the herd. Often these reproductive catastrophes are not detected until pregnancy testing or calving.

Diseases that cause fever can have a deleterious effect on the bull by rendering him temporarily infertile. Examples may include ephemeral fever (three-day sickness) or foot abscess.

The higher than normal body temperature affects the quality of the semen during the fever period. It can take up to three months of recovery from the infection until the quality of the semen returns to normal.

There are many infectious diseases endemic in the cattle population. There are diseases that your herd may be exposed to when you introduce new

animals or even from contact over the fence with your neighbour's herd.

Purchased bulls can be a source of introducing disease even when they appear healthy. Likewise a new bull may be exposed to an endemic disease for the first time when he comes into contact with your apparently healthy cows.

Disease may be introduced after a change in weather conditions. Three-day sickness spreads when insects that transmit it are active. Leptospirosis spreads in wet conditions.

When a herd or animal is exposed to these diseases for the first time the results can be catastrophic until immunity builds up. Once a herd is immune there may be very little evidence of the disease or further loss from it.

A biosecurity or health management plan can be developed in consultation with your veterinarian, to limit the risk of introducing diseases at a time when your herd immunity is low. Many health problems are preventable through animal husbandry practices such as vaccination.

The following is a list of some of the more common infectious health problems affecting the beef bull. These diseases can be vaccinated against.

Clostridial diseases

Clostridial diseases are caused by a group of bacteria that form spores which can survive for many years in the ground. The bacteria also live in the bowels of healthy stock. For these two reasons it is impossible to eliminate the bacteria from the herd environment, and vaccination is the only effective method of control.

5-in-1 vaccine is a very cheap vaccine, and is effective over the common five clostridial diseases:

- enterotoxaemia (pulpy kidney)
- malignant oedema
- black disease
- blackleg
- tetanus.

All five diseases result in death from toxins produced by the organisms, usually from half a day to 3 days from infection. Often sudden death is the first sign.

Treatment for all these diseases is usually unsuccessful, making vaccination the best choice.

New bulls should be vaccinated upon arrival, and a second shot given 4–6 weeks later. An annual vaccination from then on should suffice, although it is often wise to give a booster shot at least 2 weeks prior to the bull being given a change in feed ration (to guard against pulpy kidney, which often becomes a problem after sudden diet changes particularly onto highly digestible feed such as grain or lush pasture after a dry spell).

Leptospirosis

Two types of leptospira bacteria commonly affect cattle, *Leptospira pomona* and *Leptospira hardjo*, and both can affect people. Leptospirosis is a bacterial disease causing illness and death in calves and infertility in adult females, expressed as:

- mid-term abortion; or
- stillborn calves; or
- weak calves that die shortly after birth.

It can be detected by testing blood or urine samples.

All affected animals develop immunity to the strain to which they have been exposed. This level reduces over time until the herd becomes susceptible to reinfection. Heifers may be especially vulnerable.

Cattle are most commonly infected by other cattle carrying the organism. The most common means of spread is through urine contaminating the pasture or drinking water. It can also be transferred in semen.

The best control of leptospirosis is again through vaccination. New bulls should be given two shots, 4–6 weeks apart, and thence an annual booster before joining. A **7-in-1 vaccine** is also available for the five clostridial diseases and the two strains of *Leptospira*.

Vibriosis

Vibriosis is a sexually transmitted disease, mostly spread by natural mating. Bulls are the main carriers of the disease – another reason for isolating the breeding herd from the next door neighbour's bull.

Vibriosis infection causes the early death of the foetus, observed as:

- increased returns to service;
- a widening spread of the calving period; and
- increased proportion of empty females at pregnancy testing, especially in first-calving heifers.

Vaccination of bulls only is usually sufficient to control vibriosis. Young bulls and bought-in bulls should receive two shots 4–6 weeks apart, with the second dose a month before joining. An annual booster 1 month before joining is then required.

Bovine viral diarrhoea virus (pestivirus)

Bovine viral diarrhoea virus (previously called 'Bovine pestivirus') is widespread in the Australian cattle population. It causes a range of disease

symptoms such as reproductive loss (including abortions and the birth of abnormal, often small, calves with brain damage), ill thrift and diarrhea, respiratory disease and immune system suppression.

A bull may be a carrier of the disease and yet appear normal. If introduced to a breeding herd previously not exposed to the disease, virus spread may lead to an abortion storm and birth of persistently infected carrier animals.

Cattle can be tested for the disease, and it is possible to vaccinate the herd against it. It is wise to investigate whether any new bulls introduced into your herd have been exposed this virus.

Further information on Bovine viral diarrhoea virus can be found in Primefact 435 *Bovine pestivirus infection*.

Ephemeral fever

Ephemeral fever (three-day sickness) is a virus spread by biting insects. Its incidence varies from region to region, and its occurrence is quite seasonal.

Bulls and heifers are a high-risk group, but all ages of stock can be affected. After being affected, cattle tend to remain immune for the rest of their lives.

The disease has a sudden onset, with affected animals fevered, lame and stiff. They may remain down for up to 24 hours and occasionally longer (up to 10 days). The fever can cause temporary infertility in bulls, even for up to 6 months after recovery.

Cattle usually recover by themselves, but anti-inflammatory drugs, shade, and calcium and electrolyte solutions are useful. Consult your veterinarian.

Bulls can be vaccinated with ephemeral fever vaccine. Initially two doses a month apart are required, followed by an annual booster program, preferably in late spring before the summer–autumn viral period.

When purchasing a new bull ask for vaccination history of the herd and for a vaccination history of the bull. Be prepared to strategically vaccinate him before introducing him to your stock if the history is incomplete or not adequate for your conditions.

Further information on Ephemeral fever can be found in Primefact 434 *Bovine ephemeral fever: Three day sickness*.

Annual health checks

The health of each bull should be checked at least 2 months before joining to reduce the risk of infertility affecting joining.

Physically examine for sheath swellings, feet problems, lameness and joint swellings. Under the increased load of active service some early joint damage may become aggravated enough to inhibit serving and cause breakdown of the bull.

Assess seasonal conditions and the bull's body condition and organise supplementary feeding if needed.

Palpate and assess testicles.

Boost with annual vaccines and assess the risk that a disease may have been introduced to the bull while laid off. Were there stray heifers? Did he stray? Has your neighbour mentioned pestivirus as a problem in his herd? Discuss with your vet whether you should expand your vaccine choice from your usual selection in light of the past year's events.

Other infectious diseases of significance

Trichomoniasis

This disease is now uncommon in southern Australia, but occasionally still causes infertility problems and remains endemic in the extensive cattle areas of northern Australia.

Trichomoniasis is a venereal disease caused by the protozoan parasite *Trichomonas foetus*. It is introduced during service, causing inflammation that prevents conception or causes abortion early in pregnancy.

Cows develop immunity to the disease within 3 or 4 months, but the bull remains a carrier. Unfortunately there is no commercial vaccine for the disease. In some cases treatment of the bull's prepuce by a veterinarian may be successful. Often it is best to simply cull old bulls.

Trichomoniasis in cattle is a notifiable disease under the *Stock Diseases Act 1923*.

Bovine Johne's disease

Bovine Johne's disease (BJD) is a fatal, incurable chronic wasting disease caused by the bacteria *Mycobacterium paratuberculosis*.

Cattle are usually infected as calves and are relatively immune once they reach 12 months of age. It may then take several years for an animal to become visibly sick. During that period they may have spread disease to other susceptible young stock.

Terminally animals lose weight and scour, maintaining their appetite but eventually wasting away and dying. The bacteria spread in the manure of an infected animal but terminally the bacteria are found in all body tissues including placenta.

Infected cows commonly infect calves. Infected bulls have introduced the disease into herds.

This disease can be eradicated from a herd or property over time but it usually involves culling at least some animals. Market access may be affected for an infected herd. Stud markets and some export markets are most severely affected.

There is no vaccine, and BJD cannot be treated so avoiding the introduction of BJD to your cattle is important.

Purchased cattle should undergo a risk assessment before introduction to your herd. Seek veterinary advice if you are unsure how to do this. Always ask for a vendor declaration about the Johne's disease status of the herd. There may be some testing information or quality assurance information available from the vendor.

Currently it is very difficult to confidently assure freedom from bovine Johne's disease. Testing of individual blood samples from the live animal alone is not very sensitive. Positive blood tests will be followed with culture of the manure or autopsy to give a definite diagnosis. Large numbers of cattle tested over many years gives the best assurance of low risk of having BJD present.

The voluntary National Johne's Disease Market Assurance Program (MAP) allows herds to be monitored and assigned a status as to their risk of the disease. The aim is to identify herds from which the risk of spread of Johne's disease is minimal. A database query facility for MAP-accredited herds is available at www.animalhealthaustralia.com.au/programs/jd/mapdatabase.cfm (from Animal Health Australia's Johne's Disease Information Centre).

Johne's disease is a **notifiable disease**, and there are strict guidelines which must be adhered to regarding the status of cattle crossing state borders.

A national system of zoning to assist in the control of bovine Johne's disease has been introduced around Australia. There are regulations controlling movement of cattle between BJD zones. See Primefact 453 *Bovine Johne's disease zoning*.

Pinkeye

Pinkeye is caused by a bacterium producing a toxin which attacks part of the eye. Bacteria are spread by flies, long grass and dust, and the infection is affected by sunlight and physical irritation of the eye.

Young bulls are more susceptible as they have lower immunity. *Bos taurus* bulls appear to be more susceptible than *Bos indicus*, as do bulls with protruding ('poppy') eyes or unpigmented eyelids.

Pinkeye reduces growth rates in young cattle, and in the worst case can leave the animal blind.

Other diseases

Bloat

Bulls, especially young bulls, are as susceptible to bloat as other cattle. Deaths occur by asphyxiation and compression of the blood supply due to the expanding rumen.

Frothy bloat is the most common, and occurs usually when bulls eat high-content legume pasture.

The best control is to carefully manage access to the more risky pastures. Other reasonably successful measures include:

- administering slow-release rumen capsules. These provide Rumensin® to the rumen, which reduces the production of fermentative gases. They are the most expensive, but probably the best, form of prevention;
- feeding hay to bulls to reduce their intake of pasture;
- providing bulls with bloat-control blocks or licks, after training them to use them.

Genetic disease

There are many genetic diseases in cattle that are inherited as 'recessives'. These diseases occur when a calf inherits genes with specific mutations from both clinically normal, carrier parents. Recessive diseases usually present at, or soon after, birth. However, there are some that are lethal to the unborn calf, and others that affect the calf as late as at weaning. The prevalence of such diseases is related to the level of inbreeding within a population.

Generally, specific inherited diseases are more common in particular breeds. However, crossbred or composite bulls can transmit the mutations that cause specific diseases if they inherit the mutation from a 'purebred' ancestor. For example, Brangus bulls have been identified that carry either *α-mannosidosis* from an Angus ancestor, or Pompes disease from a Brahman ancestor.

Research has defined the DNA basis of some recessive diseases in cattle, which has led to the development of very accurate tests to identify carriers of specific mutations. As recessive disease can occur only in calves that inherit specific mutations from both parents, production losses will be avoided by ensuring that bulls are not carriers for specific defects known to occur in that breed.

Table 1 identifies the breed of origin for specific genetic diseases (for which accurate DNA tests are available) that occur in Australian beef cattle. Included in the table are contact details of the appropriate breed societies to assist bull buyers in

determining the disease genotype of potential purchases.

Some diseases are inherited in a more complex way than simple recessive genes. There may be multiple genes involved. An example is 'cancer eye.'

Cancer eye occurs on the eyeball, lid or third eyelid, and its incidence is heritable. Cattle with good pigment around the eye, or more importantly with well-set and hooded eyes, are less susceptible.

The disease can reduce the useful life of large numbers of cows, and affected bulls will pass on their genetic susceptibility to their offspring.

Unattended cancer eye cases have been identified as a welfare problem.

Parasites

The level of parasitism in herds is variable, depending on many factors including the regional presence of particular parasites, stocking rates and other management practices.

Adult cattle are often relatively immune to many internal parasites. Animals under stress can become temporarily more susceptible to parasites. Droughts cause extra stress on cattle and parasites become a clinical problem. Bulls under stress from social stressors (mixing groups of adult bulls or introducing new ones, fighting or joining cows) may also temporarily become more susceptible to parasites.

Each herd should have an individually designed internal and external parasite control program, designed in consultation with a veterinarian.

Internal parasites

Bulls can suffer from internal parasites, the most troublesome being roundworms and liver fluke. In some areas, particularly coastal swamps, stomach fluke may also be a problem.

The common types of roundworms include:

- ostertagia (small brown stomach worm)
- haemonchus (barber's pole worm)
- trichostrongylus (black scour worm)
- nematodirus (thin-necked intestinal worm)
- cooperia (small intestinal worm).

Roundworm infestation lowers growth rates and, if severe, causes:

- loss of condition
- scouring
- rough dry coats
- eventual death.

Generally, cattle older than about 20 months develop enough resistance to roundworms for them not to be a problem, except in herds where there is a high challenge rate.

Bulls should be drenched prior to joining, and perhaps at other times depending on needs. It is wise to use a drench that is effective against immature roundworm larvae.

The most damaging parasite of adult cattle is liver fluke, which causes:

- poor growth rates;
- weight loss;

Table 1. Breed of origin of specific genetic diseases, and contact details

Breed of origin	Genetic disease	Phone	Breed society (e-mail address)
Angus	*α*-mannosidosis	02 6772 3011	office@angusaustralia.com.au
Murray Grey	*α*-mannosidosis	02 6771 5151	officemanager@murraygrey.com.au
Galloway	*α*-mannosidosis	02 6027 3361	office@gallaway.asn.au
Shorthorn	Pompes disease	02 6774 9622	shorthorn@shorthornbeef.com.au
Brahman	Pompes disease	07 4927 7799	abba@brahman.com.au
Poll Hereford	Inherited congenital myoclonus	02 6772 1399	info@pollhereford.com.au
Poll Hereford	Maple syrup urine disease	02 6772 1399	info@pollhereford.com.au
Shorthorn	Maple syrup urine disease	02 6774 9622	shorthorn@shorthornbeef.com.au
Limousin	Protoporphyria	02 6771 1648	office@limousin.com.au
Salers	*β*-mannosidosis	02 6773 2393	salers@abri.une.edu.au
Dexter	Bulldog calves	02 6773 3471	dexter@abri.une.edu.au

- anaemia;
- lack of stamina.

and hence will have an effect on the bull's fertility. In severe cases it will also lead to death.

Bulls should be grazed away from wet or poorly drained paddocks, as these are the areas where infection is picked up. Fluke drenches are only needed if fluke is definitely on the property. New bulls can be treated, especially if their past history is not known.

External parasites

For most of New South Wales, lice are the most important external parasite. While stock in good condition are usually not troubled by light infestations of lice, bulls often carry heavy infestations. Heavy infestations make cattle unthrifty, look scruffy, and lose hair from rubbing – possibly causing damage to fences and troughs in doing so.

A treatment in late autumn or early winter using a pour-on lousicide may suffice.

In coastal and some other areas, ticks and buffalo flies are a major farm management problem. Veterinary advice should be sought because of the dependence on chemical treatments for these parasites.

Interstate movement requirements

In many cases bulls purchased interstate for delivery into New South Wales, and bulls sold within New South Wales for delivery to other states, require signed declarations as to their health status. These may require owner declarations, district or state veterinarian certification or a combination of both. At times inspections or specific health testing may need to be organised.

These requirements do change with time, so it is wise to check with the local Rural Lands Protection Board or NSW Department of Primary Industries (NSW DPI), for the current requirements before you buy or sell bulls interstate.

For those with internet access details of current requirements are usually available at state government websites.

- www.agric.wa.gov.au
- www.dpi.nsw.gov.au
- www.dpi.vic.gov.au
- www.dpi.qld.gov.au
- www.pir.sa.gov.au

Glossary

Endemic: found regularly among a particular population or in a particular area.

Notifiable disease: A disease that must be reported to a district veterinarian or ranger employed by the Rural Lands Protection Board for the district in which the stock are located, or a veterinarian employed by the Department of Primary Industries within 48 hours of suspicion or confirmation of the disease, or in the case of exotic disease, as soon as suspected.

Further information

This publication is adapted from the NSW Agriculture (now NSW DPI) *Better Bull Buying* manual. Other publications adapted from this manual include:

- *Bull management*
- *Bull soundness – reproduction*
- *Bull soundness – structural*
- *Yearling bulls – tapping their immense potential*

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