BOPRIVA™

Transform behaviour. Reduce stress. Raise potential.

TRANSFORM BULL MANAGEMENT WITH BOPRIVA

VETERINARY GUIDE

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Pfizer Animal Health

BOPRIVA

Bopriva is a unique new vaccine for the temporary reduction of testosterone in bulls.

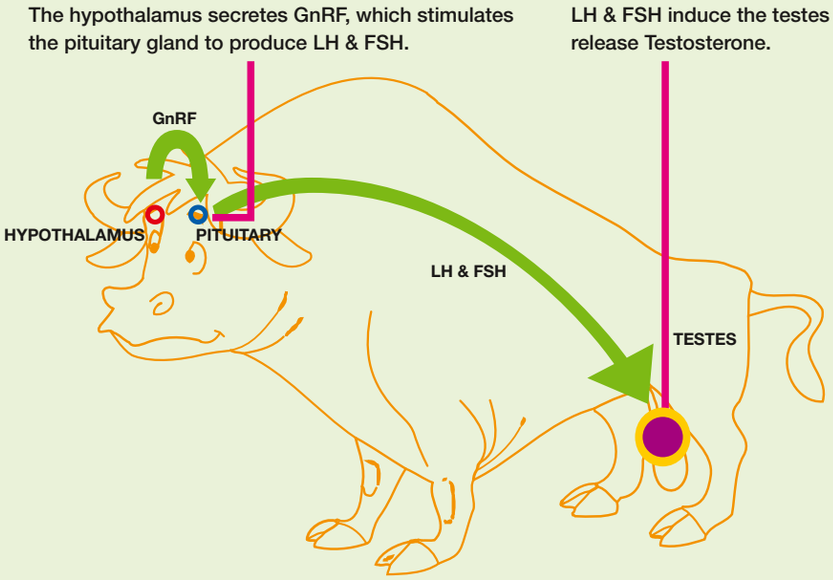
Through its effect on testosterone, Bopriva reduces aggressive and sexual behaviours in bulls, providing farmers with a highly effective management tool.

For the first time, farmers can enjoy the benefits of running more easily manageable bulls in their production systems. We call these animals Agreeabulls™.

WHAT IS BOPRIVA

- Bopriva is a vaccine which induces antibodies against GnRF (gonadotrophin releasing factor). Bopriva contains GnRF conjugated to a carrier protein and formulated with a novel adjuvant called AdvaSure®. AdvaSure is made up of an immuno-stimulating complex which optimizes immune response.
- Bopriva is not a hormone
- Bopriva is not an artificial growth promotant
- Bopriva contains no genetically modified organisms

WHAT AFFECTS BEHAVIOUR?



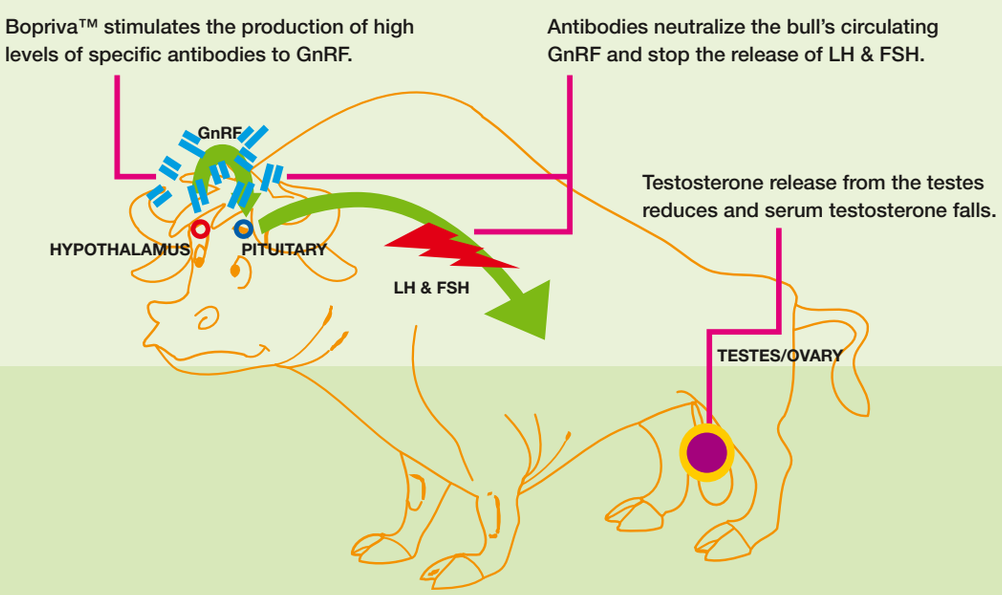
GnRF is released from the hypothalamus and triggers the secretion of LH (luteinizing hormone) and FSH (follicle stimulating hormone) from the pituitary gland.

LH and FSH stimulate the testes to produce testosterone.

Testosterone is the key hormone affecting male sexual and aggressive behaviours.

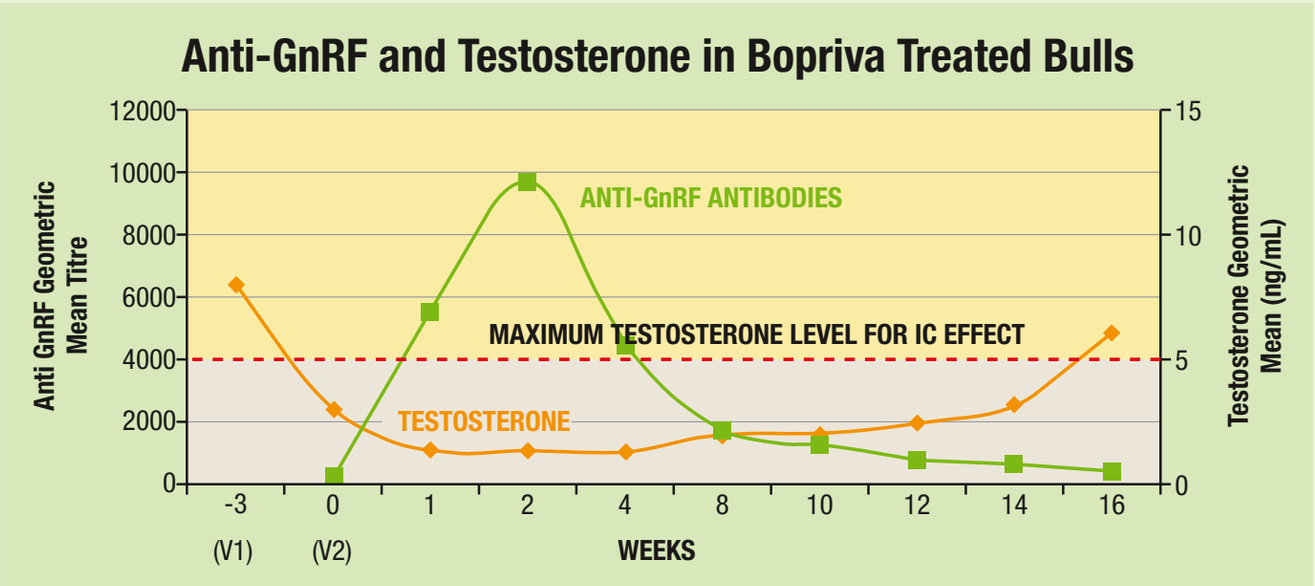
HOW DOES BOPRIVA WORK?

The first dose of Bopriva primes the immune system. A second dose acts as a booster and stimulates the production of high levels of specific antibodies that are very effective at neutralizing GnRF. This stops the activation of LH and FSH for approximately 3 months which reduces testosterone release.



TESTOSTERONE SUPPRESSION

The relationship between anti-GnRF titres and serum testosterone levels is clearly demonstrated below. (Study Reference. 6930E-14-06-162.)



Some bulls may show a rise in anti-GnRF titres and a reduction in testosterone levels, after a single primary injection. However for sustained suppression of testosterone across all bulls, a booster injection is essential.

HOW DOES BOPRIVA AFFECT BEHAVIOUR

The temporary reduction in the serum levels of testosterone in bulls results in decreased sexual and aggressive behaviour.

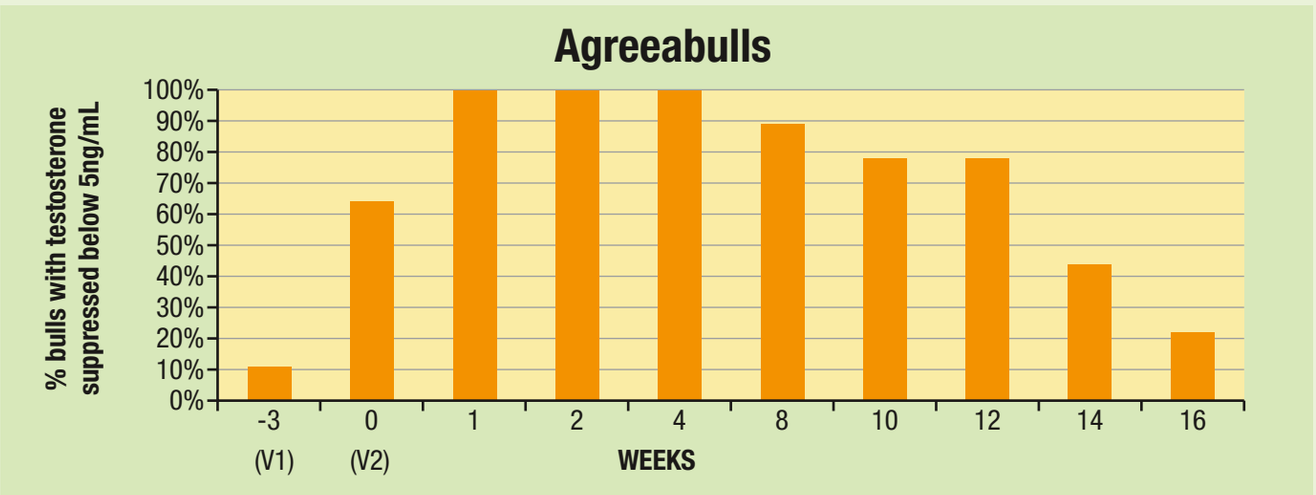
When the vaccines effect wears off the testosterone levels rise and Agreeabulls revert to bulls.

DURATION OF BEHAVIOURAL EFFECT

Sexual and aggressive behaviours in bulls are moderated by testosterone levels, however the influencers of behaviour are multi-factorial. The behaviour of mobs of treated bulls may be influenced by factors such as genetics, feeding level, handling, weather, stocking density, proximity to untreated bulls, proximity to female cattle, etc.

Therefore the level and duration of behavioural modification is likely to vary between individual animals, between different mobs of bulls and between different properties.

Overall the duration of testosterone suppression is approximately 12 weeks, however variation in response in individual animals is to be expected, and as shown in the graph below may range from 4–16 weeks or more. (Agreeabulls are defined as bulls with testosterone levels below 5ng/mL.)

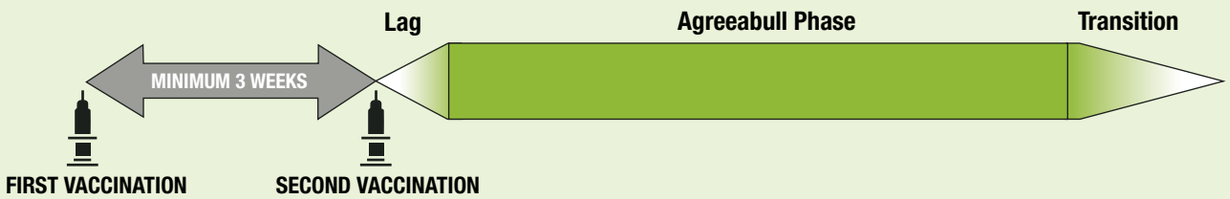


If the behaviour of individual bulls within a treated mob becomes undesirable or disruptive, they can be removed from the mob, or revaccination with Bopriva could be considered.

The effect of revaccination of bulls which have previously received a full course of two shots of Bopriva, with either a single booster or a repeat course of two shots, has not been assessed at this time. Further studies on booster vaccination will be ongoing – for more information contact Pfizer Technical Services.

WHAT HAPPENS AFTER BOPRIVA VACCINATION?

Bopriva causes temporary suppression of testosterone following a two shot vaccination regime, which improves the behavioural management of bulls.



Lag phase: It takes **9 days after the second vaccination until maximum** testosterone suppression is achieved. So it is recommended to wait **at least 10 days after the second vaccination** before mobbing unfamiliar groups of bulls.

Agreeabull phase: This is the period of maximum testosterone suppression and behavioural control.

Transition phase: Agreeabulls are gradually reverting to bulls over a period of a few weeks as the treatment effect wears off.

FLEXIBLE DOSING SCHEDULE

Clinical trials demonstrate a unique feature of Bopriva vaccine – the **duration of testosterone suppression** is dependent on the **interval between the first and second vaccinations** . The benefit of this effect is that farmers can use the vaccination interval to **manipulate the length of Agreeabull behaviour**, to suit their own systems and objectives.

Short vaccination interval. (3–4 weeks)	**Long vaccination interval. (6–8 weeks)**
Short winter season.	Long winter season.
Mobbing bulls & short term behavioural control.	Mobbing bulls & longer term behavioural control.
Early finishing bulls – late winter / spring slaughter.	Later finishing bulls – Spring / summer slaughter.

BALANCING BEHAVIOURAL CONTROL AND GROWTH

Clinical trials show that the growth rates and yield of Agreeabulls are normally equivalent to untreated bulls under the same winter grazing conditions and stocking rates.

However prolonged periods of immuno-castration could potentially influence growth rate, fat deposition and grade, particularly if the effect extends into the spring. So the **timing of vaccination** is important to ensure that the testosterone levels are not suppressed for longer than desired and are returning to normal in the spring.

PLANNING VACCINATION DATES

Careful planning of vaccination dates is required. To achieve the best results from Bopriva farmers **must** answer two questions.

When do I want the Bopriva effect to start and how long do I want it to last?

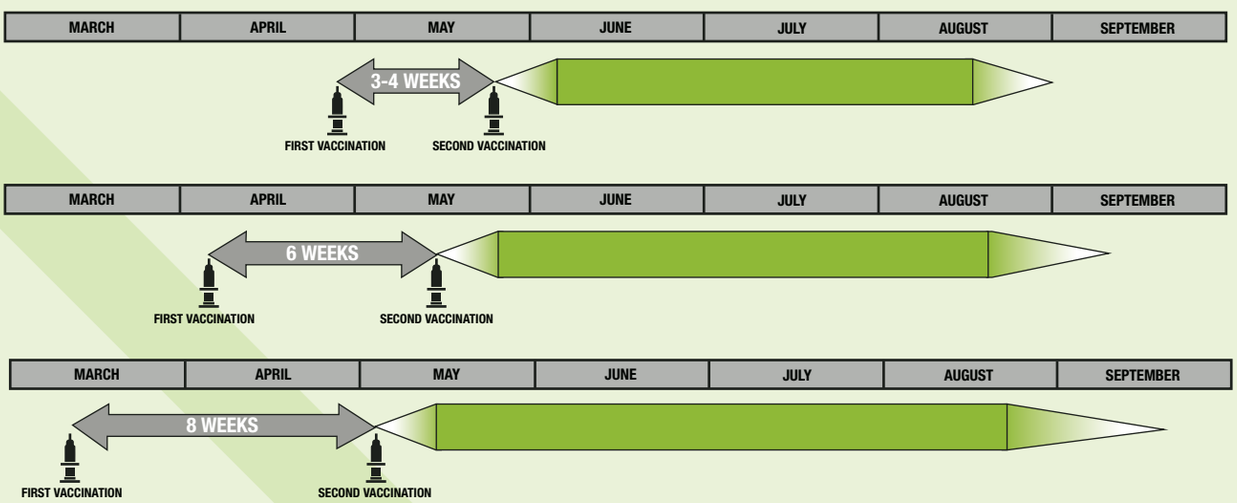
Start Date: The **second injection of Bopriva** should be given **10 days before this date.**

Duration of Effect: The **first injection of Bopriva** is recommended to be given **3 to 8 weeks before the second injection** – depending on the **duration of effect** required. The following table can be used as a guide.

Vaccination Interval	**Minimum Duration of Effect (Post Second Bopriva Injection)**
3–4 weeks	12 weeks
6 weeks	14 weeks
8 weeks	16 weeks

Note all timings are approximate – individual and mob results will vary.

Examples of different vaccination regimes are shown below.



For any additional information or to download the Bopriva Treatment Calculator, which assists in vaccination date planning and the resulting duration of effect, please go to **www.bopriva.co.nz**

BOPRIVA MAY RESULT IN IMPROVEMENTS IN THE FOLLOWING BEHAVIOURS:

- Fighting
- Sexual Mounting
- Damage to infrastructure such as fences
- Pawing, digging and pasture damage
- Bellowing
- Dominance and territorial behaviour

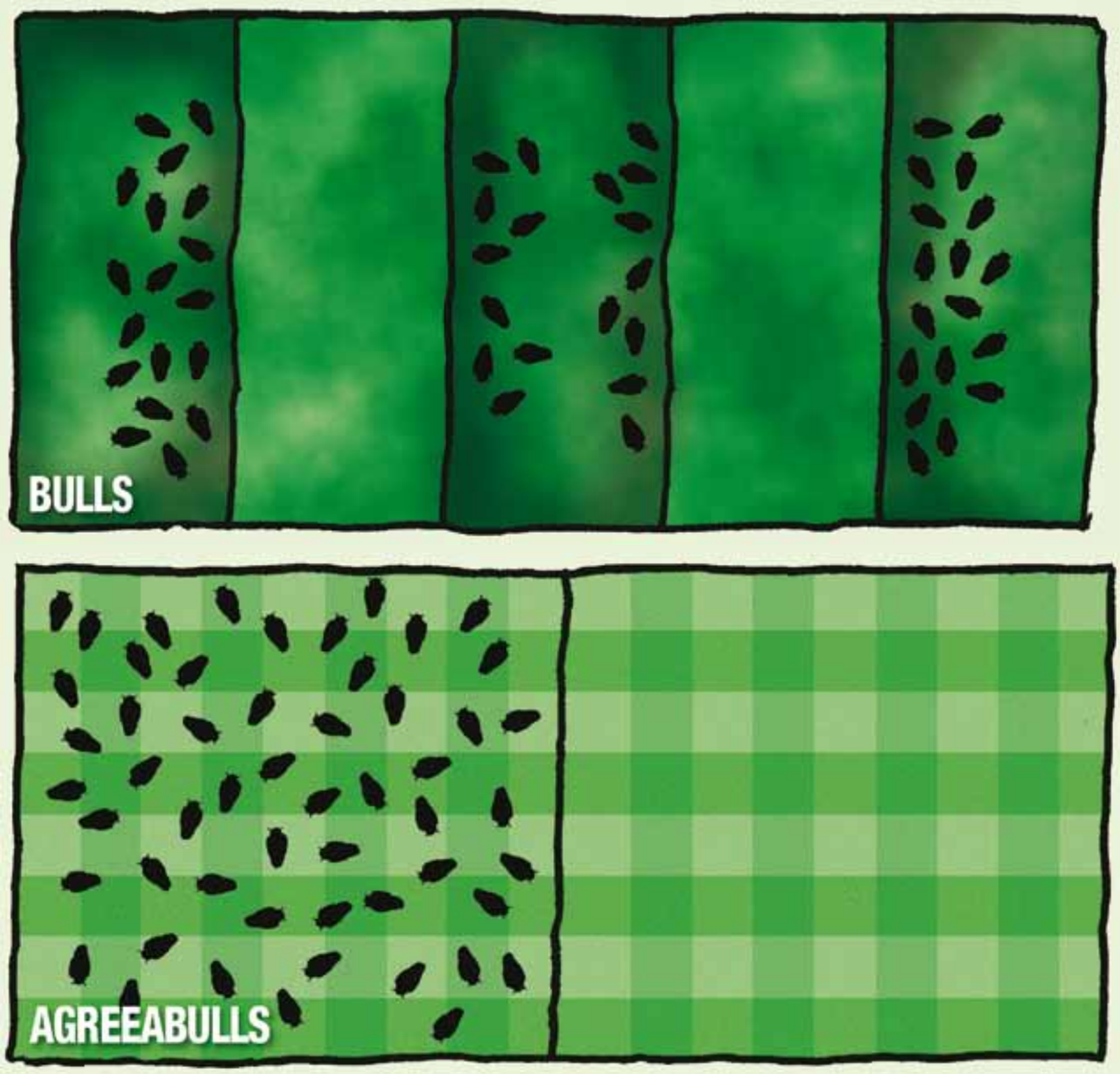
POTENTIAL BENEFITS FOR BULL FARMERS

- Reduced labour
- More grazing management options
- Better pasture – less damage, pugging and faster regrowth
- Fewer injuries or deaths from fighting and riding
- Less damage to fences and infrastructure

TOWARDS BETTER MANAGEMENT OF BULLS AND PASTURE

Bopriva provides farmers with more grazing management options. Bopriva helps to manage larger mobs of bulls in close confinement, providing savings in time and labour.

Bopriva is particularly beneficial for winter grazing schedules, e.g. strip grazing or grazing crops. As the vaccine effect wears off in the spring the testosterone levels rise, allowing the natural growth rate advantage of bulls to be matched to the increased spring feed supply.



Bopriva may also help to preserve pasture as better behaved bulls are less likely to paw, dig, or otherwise damage valuable pasture, reducing pugging and ensuring more rapid regrowth.

PRODUCTION BENEFITS

Bopriva allows farmers to benefit from the natural growth rate advantages associated with rearing bulls vs steers, and without the need for surgical castration or the use of artificial hormonal growth promotants.

IMPACT ON GROWTH RATES

Bopriva is primarily a management tool, rather than a product used for a direct effect on meat production. Production benefits may be evidenced through improved grazing management and pasture utilization, and because Bopriva enables bulls to focus on feeding not fighting.

The impact of treatment on growth rates has been measured in clinical trials in Australia and New Zealand. These studies involved 3 properties with bulls on restricted feed intakes, typical of winter feed management in New Zealand. In all studies there was no significant difference in the growth rate of control bulls vs treated bulls.

The impact of treatment with Bopriva on growth rates under conditions of unrestricted feed supply has not been assessed at this time.

AGREEABULLS™

FLEXIBILITY

Bopriva is particularly suited as a labour and cost saving winter grazing management tool, however it can be used at any time of year when an improved behavioural effect is desired, for example summer drought feed pad management.

Bopriva provides 3 months of testosterone reduction, but for longer periods of control, additional injections of Bopriva can be given.

MARKETABILITY

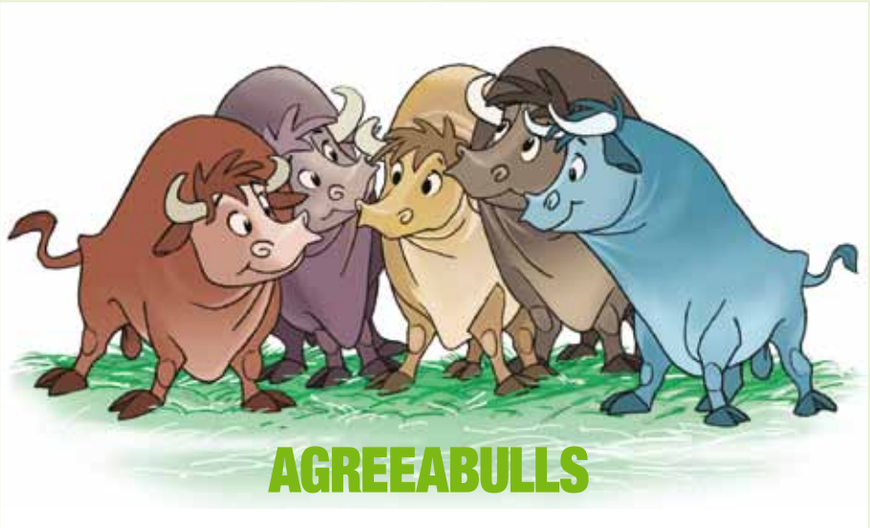
Bopriva is a vaccine with no GMOs or artificial growth promotants and has a nil meat withdrawal period.

Consumer acceptance of this technology has already occurred in the global swine industry where immunocastration is routinely used to improve pork eating quality, by reducing the testosterone mediated problem of “boar taint”.

SAFETY

Treated bulls are less likely to engage in behaviours such as fighting and mounting which can cause injuries or deaths. Reduced aggression also improves worker safety, although normal precautions must always be observed when handling bulls.

FARMER USER GUIDE INFORMATION



SELECT NON-BREEDING BULLS FOR TREATMENT

Do not treat stud bulls or bulls intended for breeding.

SELECT DATE OF TREATMENT

First vaccination should be given at least 3 weeks prior to the second dose, i.e. at least 4–5 weeks before the desired behavioural effect.

USE APPROVED SAFETY VACCINATOR

Avoid self injection.

VACCINATION

Vaccinate bulls with 1mL Bopriva and repeat at least 3 weeks later. Inject under the skin in the anterior half of the neck. Some swelling may be noticed at the injection site which may persist for a few weeks before subsiding.

MANAGE AGREEABULLS

Agreeabull™ behaviour should be noticed within 1–2 weeks of the booster, and bulls can be managed accordingly.

Up to 3 months post booster – manage any ‘short responders’ showing undesirable or disruptive behaviour – either remove from the mob or consider revaccination with Bopriva (discuss with your veterinarian).

3–4 months post booster – anticipate return of bull behaviour across the mob and manage accordingly.

BOPRIVA TECHNICAL SUMMARY

BOPRIVA

For the reduction of testosterone blood levels in post-pubertal bulls for a minimum of 12 weeks.

INDICATIONS

Bopriva is for use in post-pubertal, non-breeding bulls only.

Use in pre-pubertal bulls may result in a lengthy delay in the onset of puberty, which could have a detrimental effect on growth rates.

Use in bulls intended for breeding is not indicated as the long term effect on fertility is unknown but may be detrimental.

DOSAGE AND ADMINISTRATION

2 doses of 1mL, given at least 3 weeks apart, by subcutaneous injection, in the anterior half of the neck.

The second dose of Bopriva should be timed to be given 1–2 weeks before the desired onset of effect.

Use with a recommended safety injector to avoid self injection.

WARNINGS

Accidental self-injection may cause infertility in both men and women, adversely affect pregnancy or cause atrophy of sexual organs. Not to be administered by women who may be pregnant. Care should be taken to avoid accidental self injection and needle-stick injury when administering this product. Using a safety vaccinator is recommended. In the event of accidental self injection, seek medical advice immediately and do not administer the product in the future.

Some swelling may develop at the site of vaccination, and in a small proportion of cattle, may last for several weeks before gradually subsiding.

PRESENTATION

Vaccine flexipacks of 50mL (50 dose).

STORAGE

Store between 2°C and 8°C (Refrigerate. Do not freeze.)

ADDITIONAL INFORMATION

For any additional information or to download the Bopriva Treatment Calculator, which assists in vaccination date planning and the resulting duration of effect, please go to **www.bopriva.co.nz**.

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