CANTERBURY TEASER BULL STUDY

Chris Norton
Dairy Cattle Veterinarian, Dunsandel, Canterbury.

INTRODUCTION

Every mating season we all battle to get cows in-calf. Empty cows are expensive with a replacement cost of normally around $1300 (Nb. this figure has lifted and is presently sitting just above $2000!) Our current reproductive "tool box" for getting cows in-calf is not perfect. In an effort to control empty rates many farmers have had to leave bulls in their herds for longer and longer. This practice produces more and more late calving cows which require inducing the following season. We have been told that inducing is soon to be banned…… If and when this ban is enforced the NZ dairy industry will need additional reproductive tools in order to control empty rates and maintain farm profitability.

How many of you received aftershave or perfume last Christmas? Did it help…..?! Biostimulation and pheromones are a fact of nature. Birds and bees both use them but how do our daisies compare? Some of us are already convinced that the "bull effect" makes a difference however no large studies have been done in New Zealand. Our Dr Jock Macmillan (ex Ruakura scientist) completed some trial work on small mobs back in the seventies with mixed results (Macmillan et al, 1979). Any sheep farmer will tell you how ewes respond to the teaser ram, however cows are different, they ride each other! . The days of having the farm bull "vacationing" next to the milking shed seem to have long gone. Consequently the modern cow receives no bull biostimulation up until that day in December when "the lads hit the farm". How many of you have seen non-cyclers start cycling a day or two after the bulls were put out? Overseas controlled studies have shown biostimulatory effects on reducing calving to cycling interval (Gifford et al., 1989; Custer et al., 1990; Fernandez et al., 1993; Alberio et al., 1987; Burns and Spitzer, 1992).The NZ dairy industry needs to know if the addition of teaser bulls to non-cycling cows in NZ enhances the reproductive performance of these cows.

OBJECTIVE

To determine if running vasectomised bulls with non-cycling cows at the start of mating affects the reproductive performance of these cows.

MATERIALS AND METHOD

Over the ‘07/’08 season the following seven Canterbury dairy farms participated in a 2000 cow teaser bull study;

Trial farm	Herd size	Number of non-cyclers at the start of mating
1	1115	229
2	637	139
3	450	277
4	540	187
5	1350	368
6	580	167
7	1350	680

Cow Preparation

1. Tail paint was applied to all cows on the trial farms 23 days prior to the start of mating.
2. At the start of mating the presence of tail paint was used to identify non-cycling cows.
3. Cow calving date and age data were then used to evenly split the non-cycling cows into two groups.
4. The toss of a coin determined which group became the treatment group (with bulls) and which the control group (with no bulls).
5. The control group remained with the milkers and received no bull exposure. The treatment group was drafted out and farmed as a separate herd with the teaser bulls.
6. Bulling cows were drafted out daily for AB.
7. Treatment cows that were put up for AB were afterwards drafted back into the milking herd.

Teaser Bull Preparation

1. Thirty well grown yearling virgin bulls were sourced. The bulls were then disease tested, vaccinated, vasectomised, nose ringed and fitted with a chin ball harness.
2. At the start of mating teaser bulls were allocated to the trial farms at a ratio of 1 bull: 100 non-cycling cows.
3. Half of this allocation was then added to the treatment group giving a ratio of 1 bull: 100 treatment cows. The other half was rested.
4. Bull were rotated every two days i.e. two days work followed by two days rest.
5. Bulls were farmed so that they only came into contact with treatment cows and had no contact with any other cows on the farm.
6. Bulls were removed from the treatment group after 21 days.

Farm Preparation

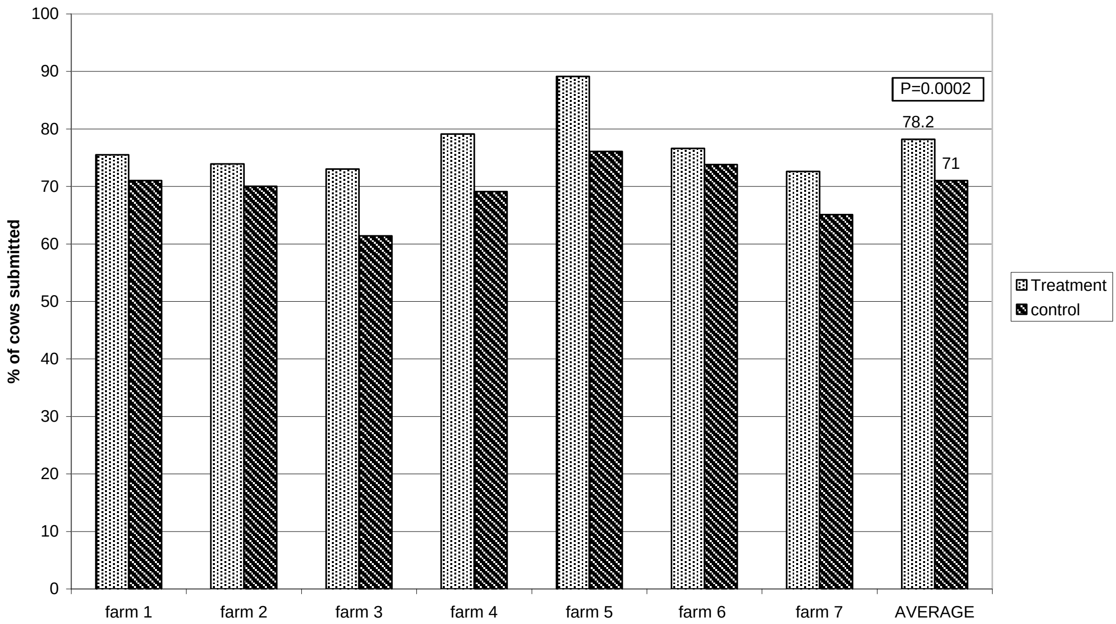
1. Flat irrigated farms were selected so that the control and treatment groups could be farmed in the same environment throughout the trial.
2. Farm managers were lectured on the importance of treating both groups equally. This included feeding levels, distance grazed from the shed, time spent on the yard etc.

Data Collection/Analysis

1. Submission data was collected over the 21 day period immediately following bull introduction.
2. Cows were scanned to determine in-calf data and final empty rate.
3. Data was compared between the two groups using the chi squared and t -test.

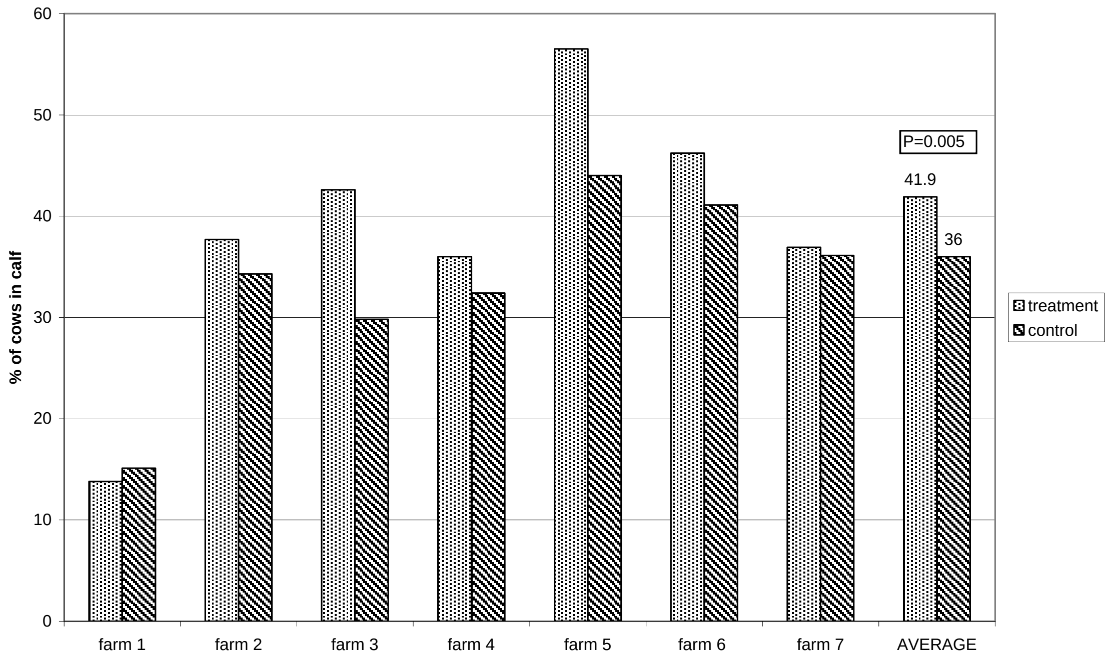
RESULTS

Figure 1: 21 day submission rate



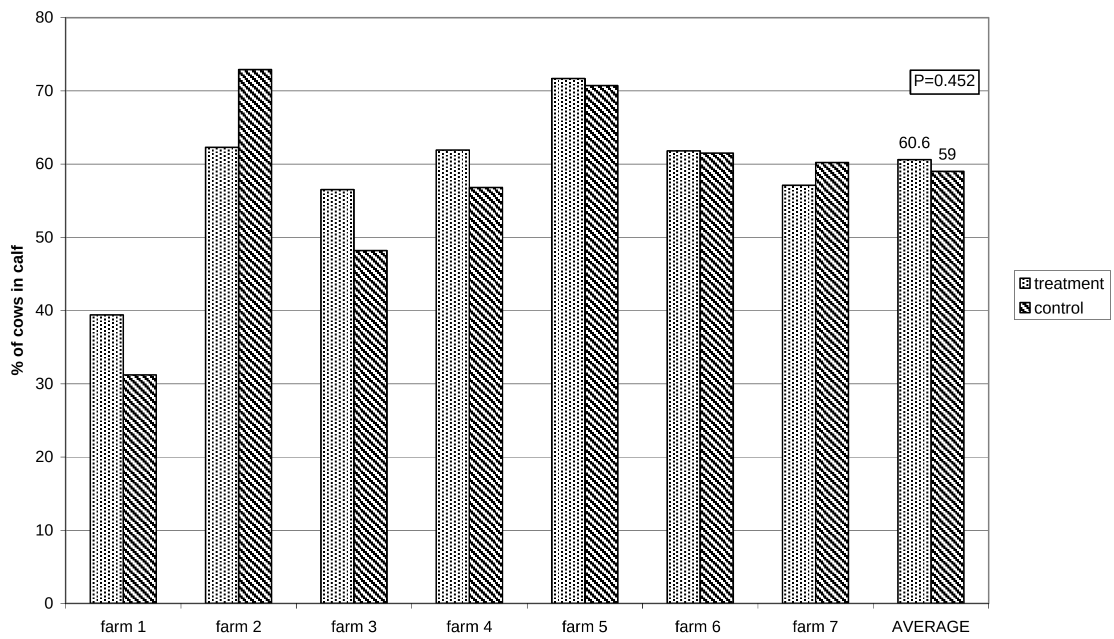
For all of the trial farms the twenty one day submission rate was higher in the treatment group (see figure1.). A total of 800 (78%) of the treatment group were seen to cycle while only 728 (71%) of the control group cycled over the first twenty one days following bull introduction. The difference of 72 cows is statistically significant (p=.0002).

Figure 2: Four week in-calf rate



On all but one of the trial farms the treatment group four week in-calf rate was higher (see figure 2.) A total of 429 (42%) of the treatment cows were in-calf while 369 (36%) of the control cows were in-calf at the end of week four. This difference of 60 cows is statistically significant (p=0.005)

Figure 3: Seven week in-calf rate



. The seven week in-calf rate difference between the two groups of 1.6% is not significant.

Figure 4: Average number of days taken to get back in-calf

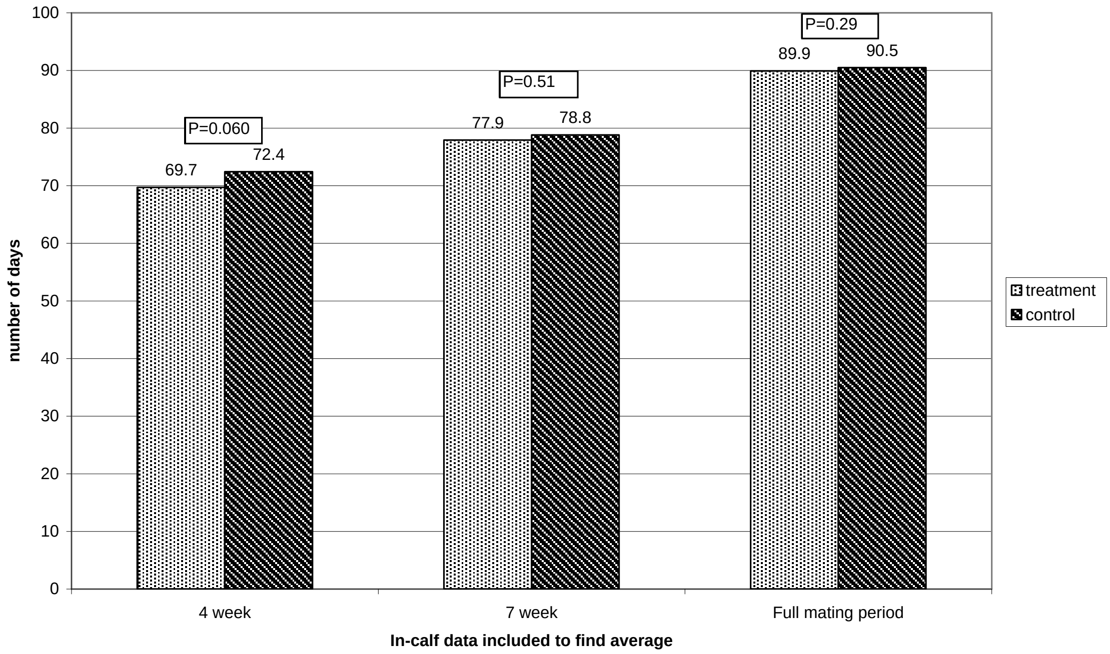


Figure (4.) shows that treatment cows that got in-calf over the first four weeks had an average time from calving to getting back in-calf of 69.7 days, compared to the control cows which took 72.4 days. For the cows getting in-calf over the first four weeks the bulls have reduced the time taken to get back in-calf by just under 2.7 days (p=0.06)

When we analyse the seven week period the treatment cows had an average time from calving to getting back in-calf of 78 days. This compares with 79 days for the control cows. This difference is not statistically significant. For the full mating period the average number of days for the treatment cows to get back in-calf after calving was 90 days, compared with 90.5 days for the control group. This difference is also not statistically significant.

Figure 5: Cumulative number of cows getting in-calf over the 1st 7 weeks of mating

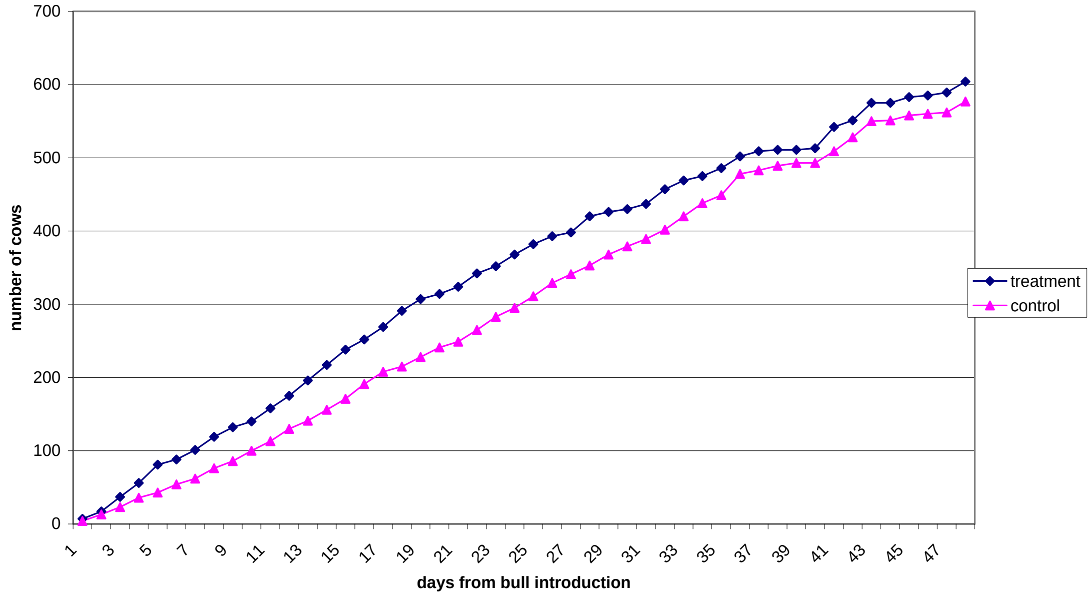
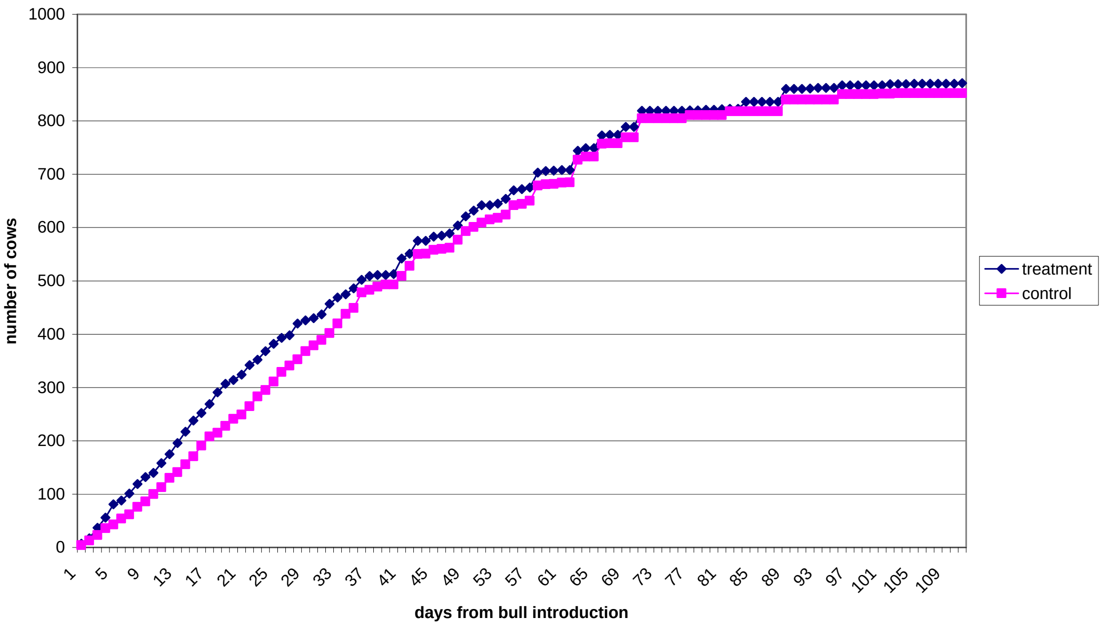
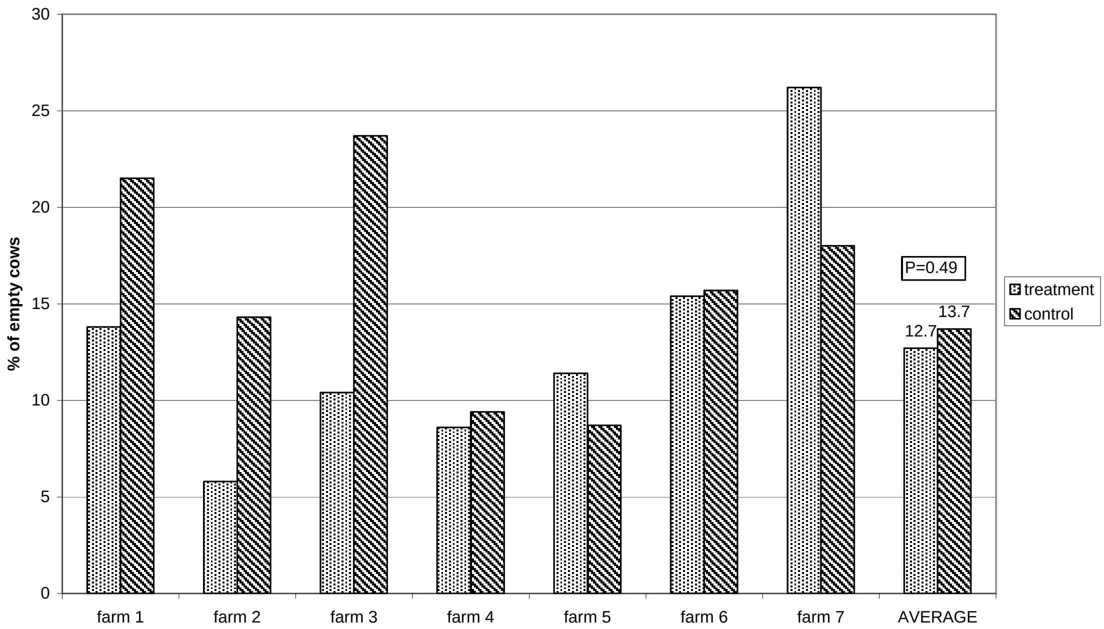


Figure 6: Cumulative number of cows getting in-calf over mating period



After day three the separation between the treatment and control groups became significant. This separation continued to be significant up until about day thirty three. From this day onwards the separation closed and was no longer significant.

Figure 7: Empty rate



Empty rates were 12.7% for the treatment cows and 13.7% for the control cows. Whilst this result favours the treatment group the difference is not statistically significant.

RESULTS SUMMARY

The addition of teaser bulls to the treatment cows produced the following statistically significant results:

1. An extra 7% (p=0.0002) of treatment cows coming into heat over the first 21 days.
2. A 6% (p=0.005) difference in the 4 week in-calf rate in favour of the treatment group.
3. An average reduction in the time taken to get back in-calf of 2.7 days for the treatment group over the first twenty eight days of mating (p=0.06).
4. A shift in the cumulative in-calf curve to the left (significant between day 3 and 33).

DISCUSSION

Submission rate data shows the bulls had a positive effect on the treatment group. There was some concern that a few "teaser-enthusiasts" might have been a little hasty with drafting out treatment cows for AB. Any of these mistakes will have falsely elevated the submission rate data in favour of the treatment group. Scanning data provided the "acid test" as to what difference the bulls were making. The cumulative in-calf rate graph shows that initially the bulls had a positive effect on getting the treatment cows in-calf. This observation is similar to what is seen when using pharmaceutical treatments such as CIDR and Ovsynch programs. A long mating period means that at the end of mating farms are left with “problem cows” that just don’t want to get in-calf. As the trial cows were initially evenly split we would expect a similar number of these “problem cows” to be present in the treatment and control group on each farm. This would explain why final empty rates were roughly the same for each group.

It was critical that treatment and control cows were treated the same throughout the study. Farm spot visits and a meeting after the bull exposure period allowed for any biases to be recorded. Walking distance and time spent on the yard was moderately shorter for about half of the treatment cows. These study biases in favour of the treatment cows were not ideal however they are thought to be minor only and thus very unlikely to have significantly affected the trial results. Feeding levels were constant between the two groups. Bulls may have had minimal exposure to the control cows at the time of yarding. This practice would have favoured the control cows however it is thought the level of exposure was also very unlikely to have significantly affected the trial results.

The tail paint system is by no means the perfect technique for identifying non-cycling cows. It is sensitive to operator interpretation and false negatives (e.g. missed/silent heats) and more so, false positives (e.g. tree rubs/flaking paint) are not uncommon. In this study veterinary rectal palpation was not used to exclude missed/silent heats. Consequently, what I have called “non-cyclers” should in fact be referred to as “no visible oestrus” cows.

The odd bull became mildly lame during the study. However the enforced two day rest period allowed time for these animals to completely recover before being used again. The chin-ball harnesses required servicing at least weekly. Having quiet animals fitted with nose rings and a good head bail facility made this job a lot easier. Some farms believed this marking aid provided no real advantage over the tail paint system however the general consensus was that the harnesses did help to detect bulling cows.

The cost/benefit analysis of the teaser bull system requires determining the expected profit difference. The Incalf “gap calculator” tool was used to determine how much more operating profit was generated by having the 2.4% higher 6 week in-calf rate in the treatment group (1023 cows). At a $5.50 payout and $1000 empty cow replacement cost a figure of $12,685 was generated. Using this figure and applying it to an average 800 cow herd with 300 non-cyclers at the start of mating we would see a benefit of approximately $4000 from using the teaser bulls. In today’s economic climate this figure will be a lot higher. In order to better compare the profit gap this calculation should be reworked using the 6% four week in-calf rate difference, a payout of $6.50 and a $1500 replacement cost. The teaser bull system has its costs. Bull preparation requires locating quiet stock followed by blood testing, vaccinating and surgery at a cost of between $150 -$250 per bull. Bulls should be virgins as this will limit the spread of sexually transmitted diseases. Bulls must be old enough to be sexually active however they should not be too old and heavy as these animals are more likely to damage cows. For these reasons it is likely that a vasectomised bull will only be able to be used for a maximum of two seasons. Finally, between seasons the bulls will need to be farmed somewhere- easier said than done!

ACKNOWLEDGEMENTS

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