Antibiotic use in surgical calf castrates: Clinical Audit

RCVS Knowledge Antimicrobial Stewardship Award Champion 2023

Tonia Simms BVSc DBR MRCVS, The Farm Vets at Hampden Veterinary Hospital, VetPartners

Introduction

As an industry we are trying to reduce antibiotic use, as highlighted by RUMA: Responsible Use of Antimicrobials in Cattle Production 2015 and RCVS Knowledge Farm Vet Champions. As a practice, we have delivered multiple Responsible Use of Medicines courses, and more specific Antimicrobial Stewardship lectures, to both our clients and the local farming community. These talks use current information from RCVS Knowledge, the World Health Organisation (WHO), and RUMA. We wish to educate our clients so that they are able to make informed decisions on when an animal may need antibiotics, how best to store and administer the medicines, and when to speak to their vet about a case.

This led us to as a team considering our own antibiotic use: The main concerns about farm practice are the conditions we are working in and the inability to create a sterile environment. Antibiotics are often used as a failsafe, rather than treating a current disease.

The discussion moved on to where we may be using antimicrobials prophylactically rather than as a treatment. Antibiotics have not been used routinely when neutering in small animals for many years, so we discussed the use in field conditions on farms for calf castrates. There was a mixed response as to whether people were using them routinely already, but no one was able to definitely say they did or did not use antibiotics prophylactically.

A risk assessment was discussed: Surgical castrates can be classed as clean-contaminated surgeries. The procedure itself is clean, although as performed on farm the environment is unavoidably not clean.

To understand our use of antibiotics for routine bovine castrates, we decided to perform a clinical audit.

Aims of the clinical audit

The first step was to quantify what percentage of routine surgical calf castrates were treated with antibiotics. Once that number was known, we could use that as a starting point to discuss with the team a new protocol for antibiotic use in calf castrates, and then communicate that to our farm clients.

Throughout the discussion we wished to protect the welfare of the animals, so we were all in agreement that if an issue arose where antibiotics were indicated, they would never be withheld.

Actions

Information on clinical audits and welfare assessments through RCVS Knowledge, SAC Quality Improvement in Veterinary Practice, and private CPD was used to construct an audit plan.

A scheduled compliance audit was performed on the Practice Management System data for the full 12 months from May 2021 – April 2022.

Each calf castration record performed by a farm animal veterinary surgeon was recorded as a 'yes' for the use of antibiotics (non-conformance) or a 'no' for the use of antibiotics (conformance). Each record had the vet (auditee) recorded.

Local anaesthesia and non-steroidal anti-inflammatory (NSAID) administration were also recorded.

Any complications or side effects of specific cases were noted, where they were recorded in the clinical notes.

This initial audit was performed to ascertain our current use of antibiotics and pain relief (non-steroidal anti-inflammatories: NSAIDs) while castrating calves. Through auditing, we identified this as an area where we could potentially reduce antibiotic use.

Results

719 castrates were recorded on 98 farm visits. 3% of visits did not contain sufficient data to analyse (either clinical notes or codes).

- 88% of castrates did not receive antibiotics – showing good compliance with the practice policy of not using antibiotics.
- 99.86% of castrates received NSAIDs.
- Of the calves that did receive antibiotics, 47% of these had clinical notes supporting this decision.
- Most common reasons for antibiotic use were placement of ligatures or cryptorchids.
- Individual vet antibiotic use ranged from 0% - 52%.
- There were no adverse effects reported from animals that did not receive antibiotics.

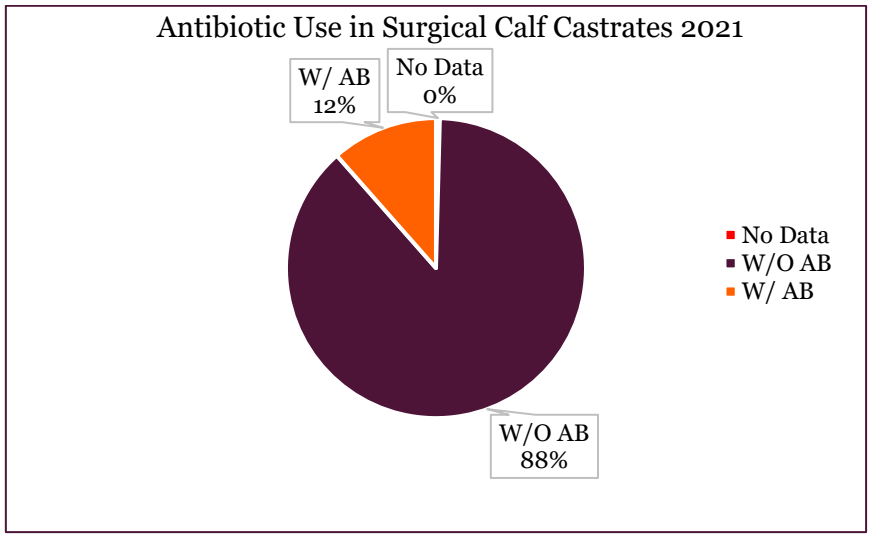

Figure 1: Breakdown of all surgical calf castrates who did and did not receive antibiotics.

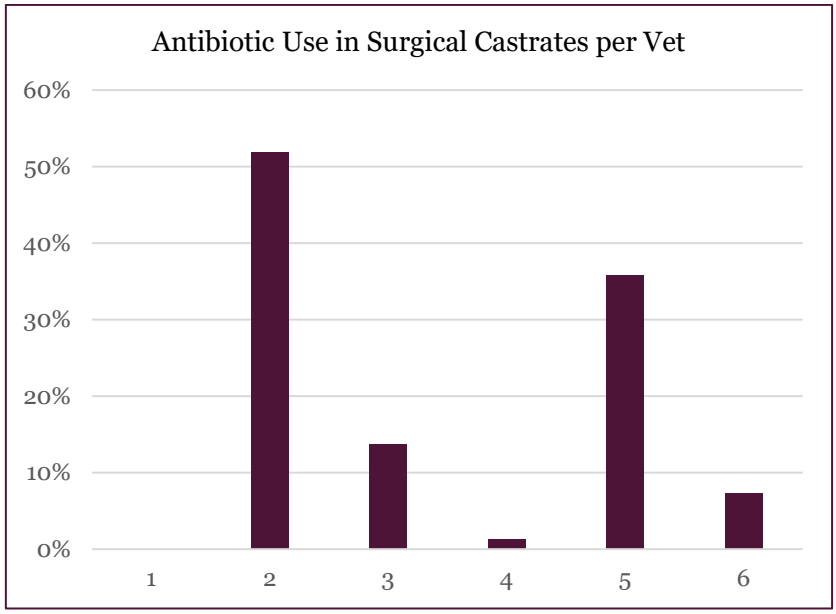

Figure 2: Antibiotic use in surgical calf castrates per vet

As a team, we were extremely pleased with the results, but we did identify that there were still areas in which we could afford to reduce antibiotic use without detrimental effects on the calf, through evidence shown by some vets not using antibiotics in the same clinical situation.

Impact of intervention

After performing the audit, the main positive effect was the morale of the team. We collectively felt like we were making active decisions to reduce antimicrobial use. We were happy that animal welfare was not compromised, especially given that the vast majority of animals were also given NSAIDs.

The audit and discussion have now led to us considering other scenarios where antibiotics are not necessary. We feel empowered to not prescribe in situations where the norm would be to do so.

There haven't been many negatives – clients do still query why we would not use antimicrobials for castrates where traditionally they have always been so. However, having the evidence that antibiotics are not needed, based on over 700 procedures, has increased the confidence of the team to say no and explain why.

Financially the clients are pleased though as each castrate costs less per head! The financial loss to the practice is largely outweighed by:

- The positive effect on the vets is that they are performing ethically.
- More time spent in discussions with clients about antimicrobial use and how the vet team can work together with them to reduce their antimicrobial use without compromising animal health.

Although the audit process was led by myself, the whole team engaged positively with the audit and the subsequent policy changes.

A policy, checklist, and standard operating procedure were written as a team based on the audit results. Everyone had an input of the content to ensure buy-in with the protocols.

The positive outcome of the audit and knowing that we're moving in the right direction has meant that the team is really well engaged with antimicrobial stewardship.

My team members needed very little support in discussing with farmers/clients about the reduction in antibiotic use as they felt self-assured that the evidence was there to prove that their use was not needed.

As with all audit cycles, the audit should be repeated after implementation of any changes to assess any impact.

2022 Reaudit

The audit was repeated for May 2022 – April 2023 to see if we had further reduced the amount of antibiotics being used. The re-audit data was collected from 929 castrates and recorded on 81 farm visits. Again, 3% of visits did not contain sufficient data to analyse (either clinical notes or practice management system codes). The results showed improved compliance with the SOP to avoid the use of prophylactic antibiotics:

- The re-audit data was collected using the same method as the first audit, where the practice management system was interrogated for the word 'castrate' and filtered to exclude any species aside from bovine/calf.
- In 2022, there was a large reduction in antibiotic use by 7% compared to 2021.
- NSAID use increased to 100% of castrates.
- Most notably, the recorded reason for antibiotic use increased from 47% to 98% - an excellent improvement in clinical notation.

	2021	2022
Number of "Castrate Visits"	98	81
Number of surgical castrates performed	719	929
Percentage of visits with sufficient clinical notes to analyse	96.94%	96.94%
Percentage of castrates administered antibiotics	**11.54%[a]**	**4.63%[b]**
Percentage of castrates not administered antibiotics	**88.46%**	**95.37%**
Of those prescribed antibiotics, how many had clinical notes supporting the decision	**47%**	**97.67%**
Percentage of castrates administered NSAIDs	**99.86%**	**100%**
Compliance	Good	Good

Figure 3: Comparison of all audit data table

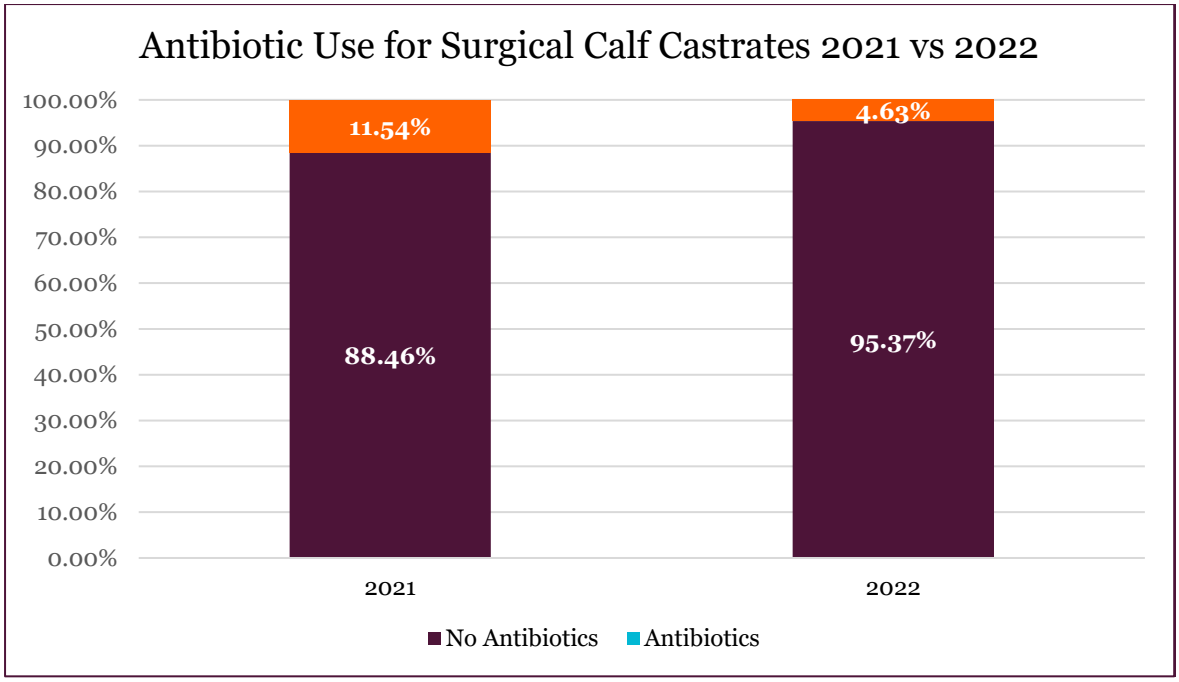

Figure 5: Comparison of antibiotic use for surgical calf castrates 2021 vs 2022

The 2022 data showed that vets were happier to perform more complicated castrates without antibiotics, such as cryptorchidism. The data and discussion empowered the team to give justification to farmers about their antibiotic choices, showing that breaking from the norm of "just in case" prophylactic administration is possible.

I am immensely proud of my team. We have demonstrated that with knowledge of current levels of antibiotic use and discussion of our prescribing choices, we can make a tangible difference in the reduction and refinement of antibiotic administration.

Summary

Clinical audit is a process for monitoring standards of clinical care to see if it is being carried out in the best way possible, known as best practice.

A clinical audit can be described as a systematic cycle. It involves measuring care against specific criteria, taking action to improve it, if necessary, and monitoring the process to sustain improvement. As the process continues, an even higher level of quality is achieved.

What the clinical audit process is used for

A clinical audit is a measurement process, a starting point for implementing change. It is not a one-off task, but one that is repeated regularly to ensure ongoing engagement and a high standard of care.

It is used:

- ⇒ To check that clinical care meets defined quality standards.
- ⇒ To monitor the changes made to ensure that they are bringing about improvements and to address any shortfalls.

A clinical audit ensures concordance with specific clinical standards and best practices, driving improvements in clinical care. It is the core activity in the implementation of quality improvement.

A clinical audit may be needed because other processes point to areas of concern that require more detailed investigation.

A clinical audit facilitates a detailed collection of data for a robust and repeatable recollection of data at a later stage. This is indicated on the diagram wherein in the 2nd process we can see steps 4, 5 and 6 repeated. The next page will take you through the steps the practice took to put this into practice.

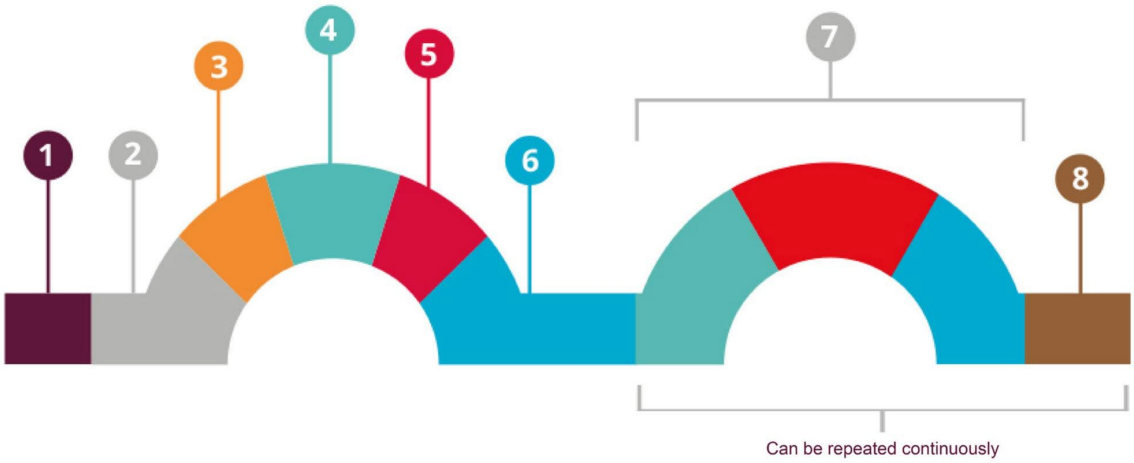

Figure 6: The Veterinary Clinical Audit Cycle by RCVS Knowledge. Available from www.rcvsknowledge.org. Developed by the Royal College of General Practitioners www.rcgp.org.uk/qi-ready

1. Choose a topic relevant to your practice

The topic should be amenable to measurement, commonly encountered and with room for improvement. The audit aimed to quantify the number of routine calf castrates receiving prophylactic antibiotics.

2. Selection of criteria

Criteria should be easily understood and measured. Retrospective data was collected for all calf castrates in 2021 to assess antibiotic, local anaesthesia, and non-steroidal anti-inflammatory use. Details of any complications of specific cases were also collected.

3. Set a target

Targets should be set using available evidence and agreeing best practices. The first audit will often be an information-gathering exercise, however, targets should be discussed and set. The target was to assess the current prescribing habits in surgical calf castrates to inform and support team discussions and the production of updated practice protocols and vet-farmer discussions to reduce antibiotic use without compromising welfare.

4. Collect data

Identify who needs to collect what data, in what form and how. Tonia Simms led the audit process with support from the whole team to gather, discuss, and then develop and implement new protocols, checklists, and standard operating procedure documents.

5. Analyse

Was the standard met? Compare the data with the agreed target and/or benchmarked data if it is available. Note any reasons why targets were not met. These may be varying reasons and can take the discussion from the entire team to identify. This audit focused on establishing the benchmark. Of the 719 calf castrates recorded, 88% did not receive prophylactic antibiotics, with 47% of those that did having clinical notes to support the decision.

6. Implement change

What change or intervention will assist in the target being met? Develop an action plan: what has to be done, how and when? Set a time to re-audit. A policy, checklist, and standard operating procedure were produced based on the audit results with input from the whole team to ensure buy-in with the protocols.

7. Re-audit

Repeat steps 4 and 5 to see if changes in step 6 made a difference. If no beneficial change has been observed them implement a new change and repeat the cycle. This cycle can be repeated continuously if needed. Even if the target is not met, the result can be compared with the previous results to see if there is an improvement. A repeat audit was carried out in 2022 to assess if a further reduction in antibiotics was achieved. Of the 929 castrates performed, 95% did not receive prophylactic antibiotics, with 98% of those that did having clinical notes to support the decision. 100% of castrates received NSAIDs.

8. Review and reflect

Share your findings and compare your data with other relevant results. This can help to improve compliance. The audit results and team discussions had a positive effect on team morale and confidence to reduce prophylactic antimicrobial use without compromising animal welfare.

You should reference this resource like this: RCVS Knowledge,. Simms, T (2024). *Antibiotic use in surgical calf castrates: Clinical Audit*. [Online] Available at www.rcvsknowledge.org/calf-castrate-audit/

Interested in submitting your own case example? Email us at ebvm@rcvsknowledge.org.