Clinical audit in farm animal veterinary practice

Part 2: Conducting the audit

This is the second article in a two-part series. The first part was published in the xxxx issue of In Practice and discussed preparing for and initiating clinical audit in farm animal practice. This article focusses on the remaining steps of clinical audit, including data collection, analysis and discussion. Both articles are based on findings from a three year research project looking at the use of clinical audit in farm animal practice. The project included conducting audits using information already in existence in the practice setting, audits focused on actively collecting information over a period of time in three farm animal practices, and a nationwide survey on the experiences and attitudes of farm animal veterinary surgeons towards clinical audit in the UK. The findings from this work demonstrate that clinical audit is achievable in farm animal practice, with strategic planning, selection of relevant topics and the setting of realistic goals.

Part 1 of this series focussed on clinical audit preparation and initiation. This second article moves on to the second stage of clinical audit and beyond; data collection, analysis of results and discussion, making agreed changes and re-auditing.

You will have decided by now on the topic you and your practice are going to audit.

1. Data collection

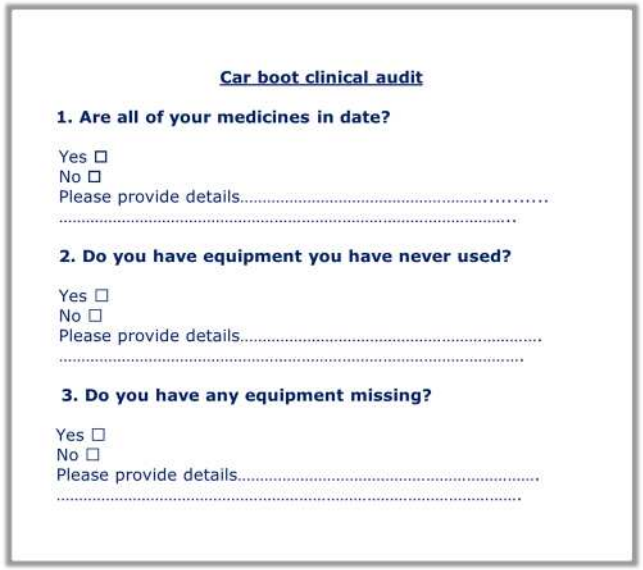
1.1 Preparing for data collection

Data collection for any clinical audit should be kept quick and easy, especially if this is the first clinical audit being conducted. Consider what you want to know and how you will analyse the data once it has been collected. Only collect data that is relevant to the audit, and ensure that the clinical audit lead is capable, and has the time available, to analyse the data.

Clinical audits can be conducted retrospectively, by looking at data that already exists within the practice, or prospectively, by collecting the data at the time the processes or actions happen. Retrospective data collection may be possible depending on the topic chosen and the availability of data; check what information exists within the practice before choosing to use this type of data collection method. Information contained within practice management software systems (PMS), billing tickets, paper records, the day book or diary and herd management software such as Interherd may all be potential sources of data that could be used for retrospective clinical audit. Data can also be collected prospectively, collecting the information on cases as you see them, by using paper data collection forms, either via individual sheets or booklets, or via computer tablets with short questionnaires completed for each relevant case at the time they are seen on farm. Online data collection forms (such as those that can be designed on software such as SurveyMonkey (SurveyMonkey Inc, Palo Alto, Califronia, USA; www.surveymonkey.com) either to be completed on farm or back at the practice could be used. Other options include Microsoft Excel spreadsheets shared via an online file storage program (e.g. Dropbox or Google Drive) or on a single computer at the practice, or a chart stuck to the office wall to be filled in when a certain case is seen. It is

important to try and keep the number of questions on a data collection form to a minimum (maximum of 10). Before including a field or question, consider what you are going to do with each piece of information at the analysis stage; if you don't know what you'll do with the information, you don't need to collect it in the first place and will make your clinical audit unnecessarily complicated. Figure 1 shows some example data collection forms.

Discuss with the team members how they would like to collect their data and what they think will be easiest for them. Think about the way that procedures within the practice occur and use established routines to help facilitate data collection. For example, if the practice has specific left displaced abomasum (LDA) surgical kits, and you have identified that a prospective clinical audit is required, ensure that a data recording booklet is kept with the kit to facilitate data recording. The person who usually puts the kits together could be given the task to ensure the booklet is always included. Particularly for prospective data collection, another important consideration that should be discussed prior to commencement is whether or not information relating to which vet or individual was responsible for a case should be recorded. Recording cases anonymously may help to facilitate a no-blame culture, which is vital when conducting clinical audit in veterinary practice.



Car boot clinical audit

1. Are all of your medicines in date?

Yes ☐
No ☐
Please provide details.....
.....

2. Do you have equipment you have never used?

Yes ☐
No ☐
Please provide details.....
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3. Do you have any equipment missing?

Yes ☐
No ☐
Please provide details.....
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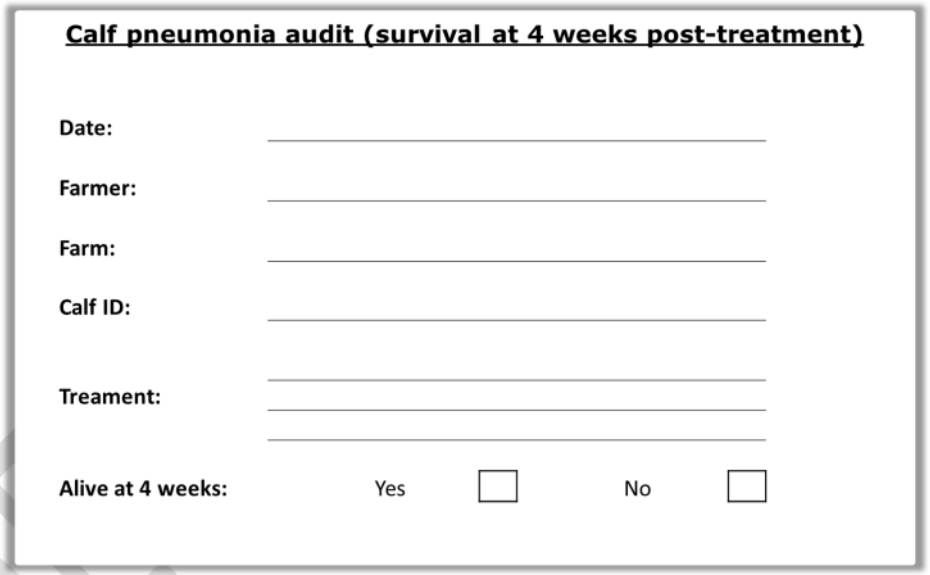


Calf pneumonia audit (survival at 4 weeks post-treatment)

Date: _____

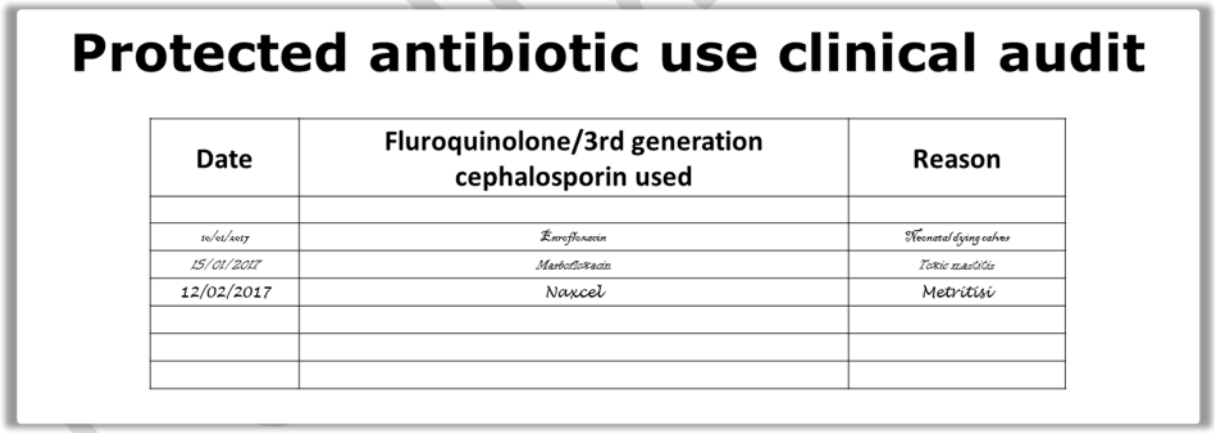
Farmer: _____

Farm: _____

Calf ID: _____

Treament: _____
_____
_____

Alive at 4 weeks: Yes ☐ No ☐



Protected antibiotic use clinical audit

Date	Fluroquinolone/3rd generation cephalosporin used	Reason
10/01/2017	Enrofloxacin	Neonatal dying calves
15/01/2017	Marbofloxacin	Toxic mastitis
12/02/2017	Naxcel	Metritisi

Figure 1 Example data collection forms that could be used for clinical audit

1.2 Pilot the audit

A short pilot (or trial run) of the clinical audit data collection will allow for any difficulties or general misunderstandings to be ironed out before embarking on the actual clinical audit takes place. A pilot also allows you to check that the data you are collecting can answer your question, and will give you an indication of how long it takes to complete and therefore, an idea of feasibility. Pilots are especially recommended for clinical audits that are planned to take place over a long period of time (e.g. collection of data for more than 3 months) or for topics with a very high case load. For simple clinical audits involving prospective collection of data, the pilot may just involve asking another member of staff to check that the data collection questions make sense, and trialling it with one or two cases you see. For retrospective audits, check to see that you can identify and pull out the data that you need to be able to answer your question. It is important from a feasibility perspective also, as if it is impossible to collect the data practically during the pilot, alterations will need to be made which will require discussion with the team. If possible (and this will depend on the clinical audit topic chosen), select an appropriate period of time for the pilot where most people will be available, or there is a slightly quieter time coming up, to enhance the changes of a successful pilot. If there are changes to be made, make sure this is discussed with the clinical audit team.

1.3 Collecting the data

Set a time limit for data collection. Try to keep this short (less than 3-6 months), especially for the first time you run a clinical audit. Some practices like to have an ongoing 'rolling' clinical audit to use as a base line for other activities within the practice. If you find you have

trouble keeping this going, consider instead running the clinical audit for a couple of months each year to avoid clinical audit 'fatigue' within the team.

Where cases are being collected prospectively, a defined time period should be stated at the beginning of the audit so that the individuals collecting the data know how long it will go on for. During the data collection period, reminders may need to be sent regularly by the clinical audit lead to prompt colleagues to continue to collect the data. For example, an email could be sent every 2 weeks reminding colleagues to record their cases.

The pilot of the clinical audit should have highlighted any potential problems with the data collection stage, but respond to any concerns raised by the clinical audit team during the data collection process. If things are not working then consider modifying or stopping the clinical audit (Box 1).

If a large number of cases are being collected, the clinical audit lead may need protected time or assistance to get the data entered into a database or spreadsheet – ensure support is available where necessary.

Box 1. Keep your clinical audit flexible

There is no need to rigidly stick to the original clinical audit plans if it is not working. Clinical audit should meet the needs of the practice; a completed audit cycle may not be necessary or appropriate, the period of time a clinical audit needs to be conducted over may need to be lengthened or shortened once it is underway or a topic may need to be changed due to lack of caseload. Any changes should be fully discussed and clearly communicated to all team members involved in the clinical audit process.

1.4 Keep good records of the clinical audit

Ensure clear records are kept from the beginning so that there is a record that the clinical audit happened (for governance purposes), and so the practice team can see what was

done. Good records will be useful for auditing the clinical audit (see later section), repeating the same, or conducting a similar clinical audit, in the future.

2. Analyse the data and discuss

2.1 Analysing the data

Analysis of the data collected should be simple and accurate (Mosedale 1998). Once the information has been gathered it should be collated in a way that can be easily analysed and then presented to the rest of the team. Analysis will depend on the type of data collected, knowledge and resources available – a small amount of numerical data may be analysed using pen and paper, larger quantities may require a programme such as Microsoft Excel. Descriptive statistics (e.g. how many people used a particular treatment or what percentage of animals survived) can provide some useful discussion points within the practice. Pie charts, bar graphs and tables may help to display the information that has been found (Figure 2). Statistical tests may give context to the results obtained where appropriate but these are often not needed and are not essential (see the section in Part 1 on the difference between clinical audit and research).

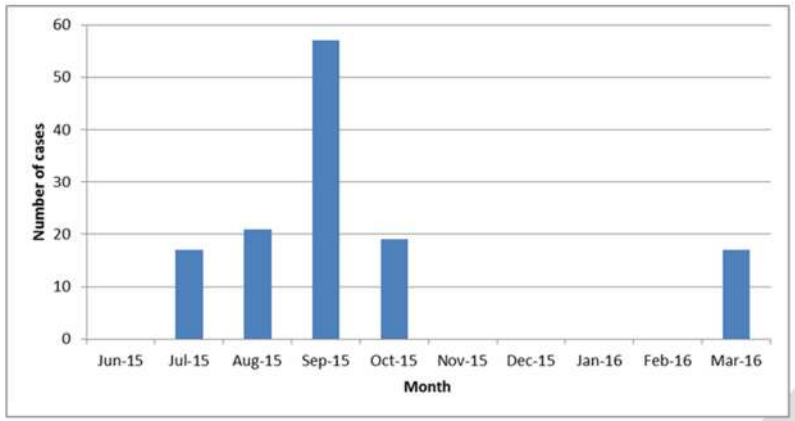
2.2 Discussing the findings

A no-blame culture is vital at this stage, even when prospective data has been collected, or displayed anonymously by the clinical audit lead. Discussing the results can be seen as a threat to some individuals (Morrell and Harvey 1999). Analysis of the results may have highlighted a procedure that doesn't appear to give as good a result as another, or an individual that has a higher failure rate compared to the rest of the team. The findings therefore must be discussed tactfully. Full support should be given to the individuals

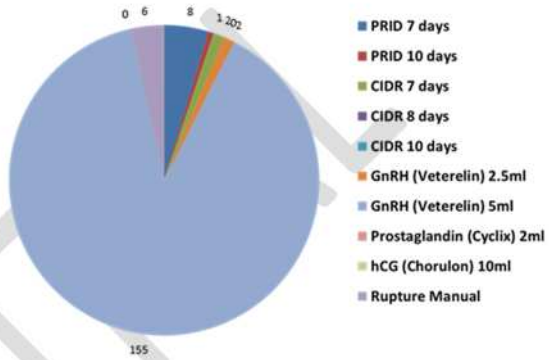
involved with the aim of discussions leading to an improvement in all case management or processes.

Where standards or information is available in the literature, the practice findings can be compared to these, taking into consideration how applicable the literature is to the practice and the type of work conducted (e.g. specialist practice versus first opinion practice; studies conducted in other countries versus in the UK etc.). Where no information is found in the literature, the team should discuss the findings and decide if and where changes need to be made. Where good or excellent practice has been demonstrated, staff should be congratulated and successes celebrated (Morrell and Harvey 1999).

The results should be readily accessible to all the team members and discussed in detail. The discussion about the results should be arranged for when the majority of team members are available, and the results and discussion dissemination to those who can't attend (e.g. via email, or other agreed method) in a timely manner.



Cases of endometritis collected by month for a clinical audit looking at the treatment of endometritis



The treatment of follicular cysts for a clinical audit looking at the treatment of cystic ovary disease

	Survival at 7 days		Survival at 2 months	
Alive	46	96%	41	95%
Dead	2	4%	2	5%

No data 20 25

Seven day and two month survival rates for cows that had undergone LDA surgery, as part of a clinical audit looking at outcomes of LDA surgery

Figure 2 The use of descriptive statistics methods to display results from clinical audits

3. Make changes

Where improvement is needed, all stakeholders should have a say in what changes need to be made. Changes may include a revision of practice procedures, extra training, investment in further equipment or facilities, improved record keeping, the implementation of practice guidance or other actions required to improve practice (Rayment 2002). Agreeing on actions to take can be difficult. For each area of change there should be a consented course of action, a named person responsible for the action (this could be the clinical audit lead, or other individuals) and a time-scale over which it should take place (Morrell and Harvey 1999).

If changes are to be made, they should be clearly communicated and expectations of staff members clearly described. Support should be given where necessary. Further discussion may be needed with certain team members who are reluctant to make the changes that have been agreed.

4. Re-audit

A re-audit should be undertaken at a subsequent time to determine how things have changed. Where good or excellent practice has been identified, re-auditing a period of time later should determine whether this good or excellent practice has been maintained. Where changes have been made as a result of the clinical audit, the re-audit should identify if the changes have made a difference. This should take place after an agreed period of time (Mosedale 1998).

The same data collection methods should be suitable for the re-audit. Re-audit data should be analysed and discussed as before, with further changes made if necessary.

5. Post-audit

At the end of the clinical audit process, it is important to gather views on how people thought it went and what they might do differently, if anything. Did people maintain interest in the topic? Did they engage with the process? If not, why not? What might help increase engagement next time? The clinical audit lead should keep notes so that these issues can be avoided for the next clinical audit.

6. Clinical audit examples

Some examples of simple clinical audits that could be used as a starting point in your practice are listed below in Box 2. For information about the different types of clinical audit that could be undertaken, see Waine and Brennan (2015).

Box 2: Clinical audit examples

1. **The use of fluoroquinolones – Process audit**
   (Possible literature to compare to: Tisdall and others (2015) achieved a 87% reduction in the use of protected antimicrobials, including fluoroquinolones, in their farm animal practice)

This is a relevant and current important topic in farm animal practice. A clinical audit looking at the use of fluoroquinolones in practice could be done retrospectively (if dispensing reason is recorded on the PMS for each dose or bottle sold), or prospectively where a simple data collection form (collecting drug name and reason for drug use) could be developed and stuck on the wall of the vets' office (See example in Figure 1). After 20 cases have been collected, a meeting could be held to discuss when and why the drugs are being used. Changes may then be implemented if considered necessary. A re-audit could be conducted 3-6 months later to see if the changes have been successful. Depending on practice culture, education of staff or clients may be required; keeping clients informed of the clinical audit may assist in highlighting the importance of the topic and promote by-in from clients. If the practice no longer uses fluoroquinolones, an audit of third-generation cephalosporin use could be considered instead.

2. **Car boot audit – Structure audit**
   (No information found in the peer-reviewed literature: As a practice, set your own benchmark as a starting point)

This is a simple, short clinical audit that all farm animal veterinary surgeons can do. Create a short data collection form with 5 – 10 questions (e.g. are all medicines in date, do you have equipment you never use, is there equipment that you need but don't have, is anything you carry not suitable for use in farm animals – see example in Figure 1). Protected time may be needed for each vet (1-2 hours) to ensure call outs don't interrupt the data collection process. A simple table of results can be created by hand or electronically (depending on the number of vets and the number of questions) and the results can then be discussed as a group. A re-audit can be conducted 3 months later to see if any changes have made a difference. This audit may also encourage tidiness and cleanliness of kit which is beneficial from a biosecurity point of view.

3. **Management of uterine prolapses – Process audit**
   (Literature to compare to: Guidelines developed by Wapenaar and others (2011))

The guidelines produced by Wapenaar et al. (2011), if not already, could be adopted by the practice. Data could be collected using a tick box paper data collection form or booklet using the guidelines as a framework by each vet. After amalgamation and analysis, adherence to the guidelines could subsequently be discussed by the team and changes made where necessary. A re-audit could be planned for 6 months later to see if any changes required have been successfully implemented.

4. **Reporting of lab results – Process audit**
(No information found in the peer-reviewed literature: As a practice, set your own benchmark as a starting point)

For this clinical audit you might decide to set a target for the time period that you would like laboratory results to be reported within. It perhaps would not be expected that any information would be found in the literature on this topic as perhaps there isn't really a 'right answer'. As a practice you might decide that you would like all lab results reported to clients within 48 hours of them being received by the practice. To do this, a data collection form could be developed with the date the results are received from the lab, the details of the lab report and the time and date the farmer was contacted. Recording could be run for 2 months and at the end of this time you could see how many results were reported within 48 hours. There may be changes needed such as what to do with urgent results, or results that might come in when the responsible vet is on holiday. It may highlight areas that need to be improved between the point the results are received by the practice and the vet actually receiving them. A re-audit would be recommended for this topic to see if any changes have resulted in the targets being met.

5. **Survival rates post left displaced abomasum (LDA) surgery – Outcome audit**
(Possible literature to compare to: Pedersen (2006) reported a 96% survival rate at 60 days post-surgery)

This audit could be conducted retrospectively if cow ID is recorded at the time of surgery and it is possible for a search for 'LDA surgery' to be carried out in the practice software. If so, a list of all LDA surgery could be collected for a 12 month period and the cows followed up a period of time afterwards – either by calling the farmer and asking directly or by using milk records (taking into consideration that not all farms milk record so this information may not be available for all farms). If individual cow ID is not recorded, a prospective audit could be undertaken. The cow ID of all LDA surgeries could be recorded (either on the ticket used for billing or on a separate data collection form) and then followed up 2 months later with the farmer or via milk records to see if they were still alive. A discussion of the findings should take place to see how survival rates in your practice compare to the Pedersen (2006) study, and if any subsequent changes need to be made to the management of LDAs, followed by a re-audit.

Conclusion

Clinical audit should be tailored to suit your practice. If planned and carried out in a simple way it can be possible to undertake in all setting types, and can be an extremely rewarding exercise. A practice based on one site with a small number of vets and few support staff are likely to be able to successfully manage different types of clinical audits to a multi-centre

practice with numerous vets and multiple farm animal administrators and support staff. The key here is to attempt questions that are relevant to each individual practice setting and the most simple of clinical audits should be attempted whilst the practice team get used to the process. More complicated clinical audits perhaps should only be attempted when individuals feel confident at conducting them, and appropriate resources are available. If practices follow carefully the steps of clinical audit, from planning through to re-audit, successful change can be made, resulting in improvement in the services that veterinary practices deliver.

Acknowledgements

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Car boot clinical audit

1. Are all of your medicines in date?

Yes ☐
No ☐
Please provide details……
……..

2. Do you have equipment you have never used?

Yes ☐
No ☐
Please provide details……
……

3. Do you have any equipment missing?

Yes ☐
No ☐
Please provide details……
……

Calf pneumonia audit (survival at 4 weeks post-treatment)

Date: _____

Farmer: _____

Farm: _____

Calf ID: _____

Treament: _____

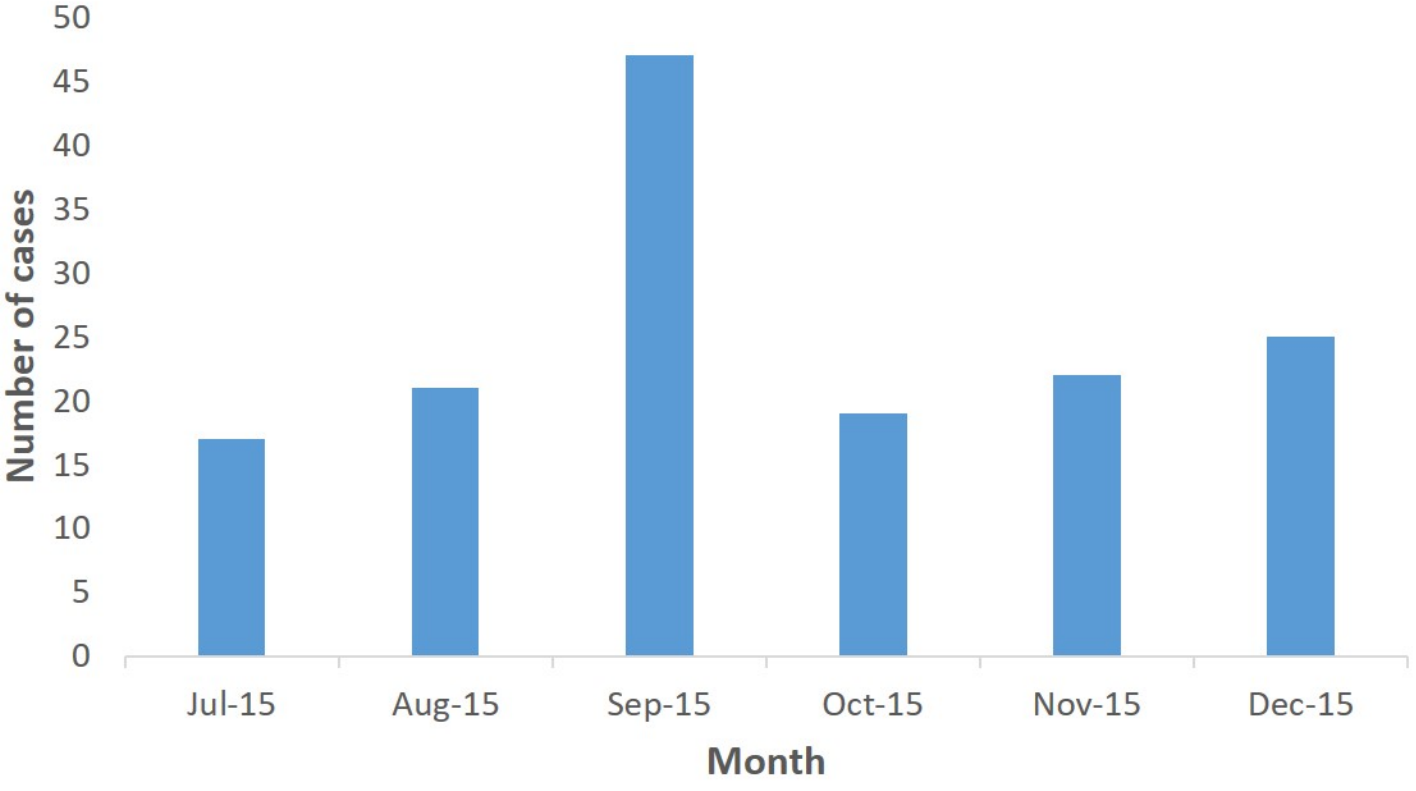
_____

_____

Alive at 4 weeks: Yes ☐ No ☐

Critically important antibiotic use clinical audit

Date	Fluoroquinolone/3rd or 4th generation cephalosporin used	Reason
10/01/2017	Enrofloxacin	Neonatal dying calves
15/01/2017	Marbofloxacin	Toxic mastitis
12/02/2017	Ceftiofur	Metritis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Number of cases
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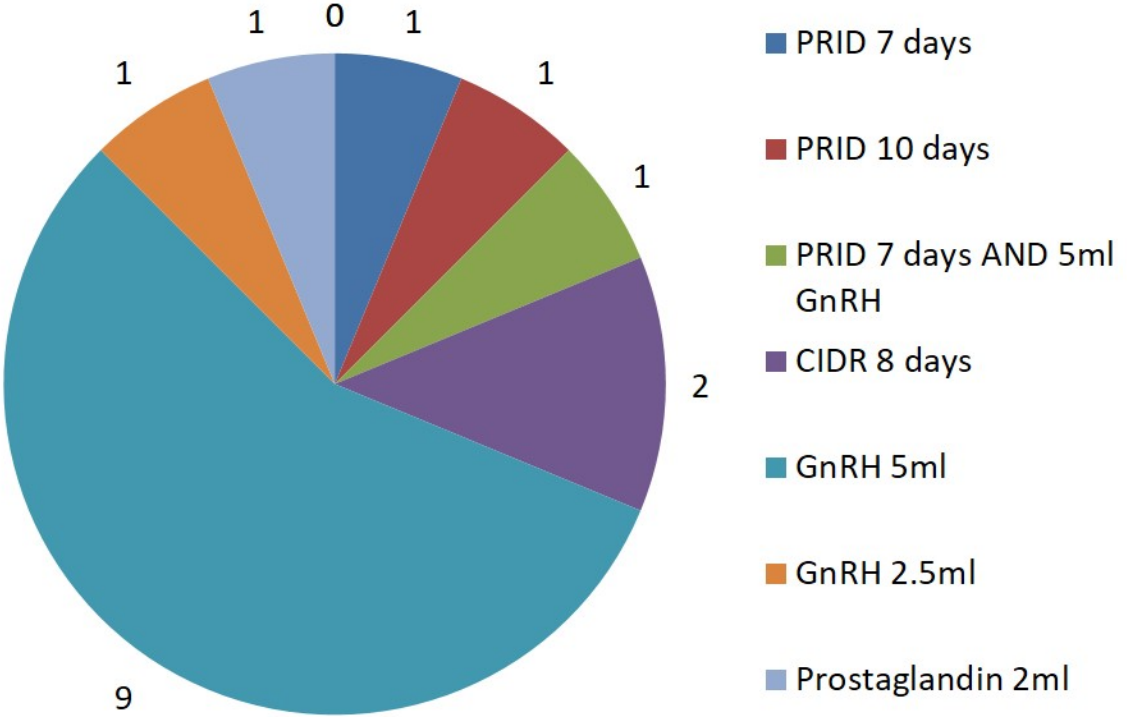
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PRID 7 days AND 5ml GnRH
CIDR 8 days
GnRH 5ml
GnRH 2.5ml
Prostaglandin 2ml