

What antibiotics should I choose?

National Advice Hub

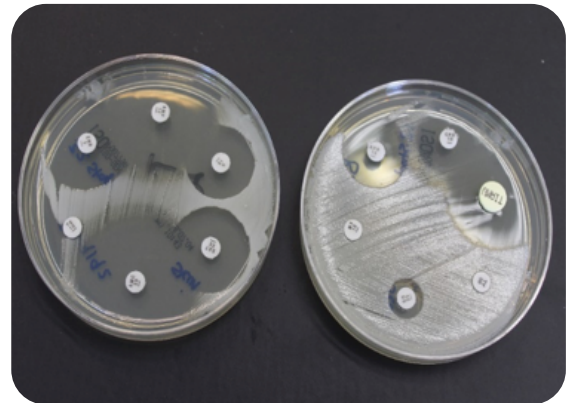
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Sensitivity testing

Antibiotic sensitivity testing (AST) is a laboratory technique that is used to select the most effective antibiotic against an isolated bacteria. As a gold standard this should be carried out on all bacterial infections before antibiotic treatment begins. The picture shows two plates with a bacterial growth, seen as the light grey material. The white discs are impregnated with different types of antibiotics. Following further incubation, zones of clearance appear around the effective drugs, as the bacteria have been killed. The more effective an antibiotic, the wider the zone of clearance. As you can see there are two antibiotic types on the right hand plate that are ineffective against this bacteria. If these were used to treat an animal, they would be ineffective, a waste of money and could contribute to resistance. Bacteria can be isolated from milk samples, swabs from infected wounds, faecal samples, nasal or lung swabs. Time scale for this procedure to be carried out can be as little as three days, in the meantime empirical antibiotics can be considered.



Empirical use of antibiotics

Antibiotics are often used empirically, while awaiting results of an AST or where an AST is not carried out due to cost, time constraints or previous experience of a similar condition. The disadvantages of not doing an AST may involve the bacterial infection getting worse if the wrong antibiotic is selected. AST should always be carried out where any antibiotic therapy has failed. In general, repeat doses of a short acting antibiotic are likely to be more effective than a single long acting injection however in some situations long-acting antibiotics are more convenient. Consider the following headings and discuss with your vet and appropriate first line antibiotic to use for each. In an industry effort to reduce the use of antibiotics you should consider if antibiotics are definitely required and take into consideration adjunctive treatments that may reduce the need for antibiotics and speed up recovery.



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Wounds or abscesses

- Drain the pus
- Antibiotics will not be required if the animal is not sick
- Superficial wounds can often be treated with topical sprays that do not always need to contain antibiotics

Lameness

Very few causes of lameness will benefit from antibiotic therapy

- Lift and examine the foot as sole ulcers, white line disease and foreign bodies will not respond to antibiotics.
- Consider footbathing as part of a control plan for infectious causes of lameness

Scour

- Focus on correcting dehydration either by use of oral or intravenous fluids, dehydration is what kills scouring calves
- Antibiotics have no action against cryptosporidiosis, rotavirus, coronavirus or coccidiosis
- Antibiotics may have some use where there is associated high temperature
- Oral antibiotic boluses have the potential to cause gut dysbiosis which in turn can cause rather than resolve scour symptoms.

Pneumonia

- Environmental conditions and good husbandry are the mainstays of controlling outbreaks of pneumonia
- *Mycoplasma bovis* is becoming more commonly involved in respiratory disease, against which antibiotics have very limited effect
- Using vaccines to prevent primary viral infection to reduce the incidence of pneumonia and requirement for antibiotics should be the focus rather than treating sick animals.

Mastitis

- AST is often carried out and is useful to identify if the bacteria involved are contagious or environmental; this points towards where control should be focussed.
- Milk samples can be frozen and submitted at a later date
- Empirical intramammary antibiotics can then be selected based on previous bacteria identified on the farm.
- Toxic mastitis. The clinical signs of a recumbent, dehydrated cow are the result of toxins produced rather than the bacteria itself. Fluid and anti-inflammatory therapy is much more essential in these cases than antibiotics.



Should I use anti-inflammatories?

Yes! The most common anti-inflammatories used in agriculture are Non-Steroidal Anti-inflammatories (NSAIDs) and include drugs such as meloxicam and ketoprofen. The main effects of anti-inflammatories are to reduce inflammation, provide pain relief and reduce temperatures and are a useful adjunctive therapy in the treatment of many diseases.

- **Mastitis**

It has been shown that using an NSAID in addition to an antibiotic leads to quicker resolution and lower SCC than using an antibiotic alone¹.

- **Lameness**

As lameness is a symptom of pain, pain relief is always going to be welcomed. Reduction in pain will have beneficial knock on effects such as increased feed intakes, production and fertility.

- **Pneumonia**

It has been shown that mild cases of pneumonia or those that have been detected early can be successfully treated using NSAIDs alone².

- **Scour**

NSAIDs have been shown to increase feed intakes in cases of scour leading to higher growth rates.

Withdrawal periods

As food producing animals, withdrawal periods are there to prevent antibiotic residues being present in food which could prove dangerous to human health or affect quality. Before licencing, every drug has a maximum residue limit (MRL) calculated, this is the maximum concentration of a substance legally permitted in food. The withdrawal period is defined as the time period between the last dose given to the animal and the residues becoming less than or equal to the MRL. The datasheet of all drugs has the withdrawal period for milk, meat and eggs clearly stated. If a drug is being used, under veterinary supervision off licence the withdrawal period is a standard 28 days (meat) and 7 days (milk). If drugs are being used together, the longest withdrawal period will apply.

