

RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE

**ruma**  
GUIDELINES

**Responsible use of  
antimicrobials  
in dairy and beef  
cattle production**

Produced by the Dairy and Beef Cattle Working  
Group of the  
**RUMA Alliance**

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RUMA is made up of the following organisations:

Agricultural Industries Confederation  
Animal Health Distributors Association  
Animal Medicines Training  
Regulatory Authority  
British Poultry Council  
British Retail Consortium  
British Veterinary Association  
LEAF  
Meat and Livestock Commission  
National Beef Association  
National Consumer Council  
National Farmers' Union  
National Office of Animal Health  
National Pig Association  
NPTC  
National Sheep Association  
Royal Association of British Dairy  
Farmers  
RPSGB  
RSPCA

Dear Reader,

It is with much pride and pleasure that I, on behalf of RUMA (the Responsible Use of Medicines in Agriculture Alliance), would personally like to welcome you to this second edition of the Guidelines. We trust that you will find them of benefit in the continual quest to maintain animals in maximum fitness and health and thereby provide food of the highest standard for the consumer.

This document is the result of the labours of many people and shows the benefit of an organisation such as RUMA which can call upon the knowledge and expertise of a large number of individuals in the different organisations that make up the Alliance.

This Guideline is a working document and is updated periodically as new information becomes available. The aim of these extended guidelines is to provide practical advice to advisers, be they veterinary surgeons or others, farm managers and interested farmers and stockpeople. Inevitably such a Guideline is lengthy and for many working at farm level they may find the shortened version. This can be found on the RUMA Website [www.ruma.org.uk](http://www.ruma.org.uk)

We are always interested in comments on how to best improve the Guidelines and any such suggestions will be welcome.

Peter Allen, MBE,  
Chairman, RUMA

## **FACTS ABOUT RUMA (RESPONSIBLE USE OF MEDICINES IN AGRICULTURE ALLIANCE)**

### **What is RUMA?**

It was set up in November 1997 to promote the highest standards of food safety, animal health and animal welfare in the British livestock industry. It is a unique independent non-profit group involving organisations that represent all the stages of the food chain from stable to table (allowing accountability and transparency) and from table to stable (allowing traceability). The aims, work and benefits of RUMA are recognised by members of the Veterinary Medicines Directorate, Food Standards Agency and DEFRA.

### **What are the Aims of RUMA?**

The main aims of RUMA are to:-

- (a) Identify issues of scientific and public concern in the areas of Public Health, Animal Health, Animal Welfare and the Environment.
- b) Provide an informed consensus view on the identified issues which will be developed by discussion and consultation.
- c) Establish and communicate guidelines which describe "best practice" in the use of medicines.
- d) Advise industry in the implementation of "best practice", especially in the development of Codes of Practice and Assurance Schemes.
- e) Communicate and to consult:
  - i) To change the way medicines are used.
  - ii) To influence the regulation of livestock production and use of medicines.
  - iii) To change the way farming is perceived.
- f) Promote the appropriate use of authorised medicines for disease prevention and control.
- g) Liaise with National Authorities.
- h) Identify practical strategies to sustain responsible use of medicines.

### **How Does RUMA Achieve its Aims?**

The most obvious way is the publication of the Guidelines for the responsible use of antimicrobials for all the major food producing species such as dairy and beef cattle, sheep, pigs, poultry and fish. These are all working documents and built up from the contributions from member organisations. They are always open to alterations in the light of new developments

RUMA is a policy making organisation rather than a political one. It aims to produce a co-ordinated and integrated approach to best practice. It has an established network with government departments and many non-governmental organisations. This allows a spread of information to be undertaken and responses to be obtained. There has also been considerable interest in Europe in RUMA's activities and discussions have taken place within the European Union and with other Member State's organisations.

Website: [www.ruma.org.uk](http://www.ruma.org.uk)

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## **Classification of Animal Medicines**

These Guidelines were drawn up at a time when the Veterinary Medicines Regulations 2005 are in draft format. The distribution categories will be changing: it is understood they will be:-

### POM-V (Veterinarian)

Medicines that may be prescribed by a registered veterinary surgeon following a diagnosis. The prescription may be dispensed by any registered veterinary surgeon or registered pharmacist.

To include: Current POM and some P products for food producing and pet animals together with current MFS products.

### POM – VPS (Veterinarian, Pharmacist, SQP)

Medicines which can be prescribed and supplied by a Registered Qualified Person (RQP) i.e. a registered veterinary surgeon, a registered pharmacist or a registered suitably qualified person (SQP) or they may be supplied separately by a RQP in accordance with a written prescription from another RQP.

Prior diagnosis is not a pre-requisite for a prescription for this category but the prescribing RQP must be satisfied that the person administering the medicine has the competence to do so safely and that the use is necessary for the routine control or treatment of endemic disease.

The RQP should take into account available Flock/Herd Health Plans when prescribing.

To include: Some current P, current PML products and MFSX products for food producing animals.

### NFA/VPS (Non Food Animal – Veterinarian, Pharmacist, SQP)

Medicines which can be supplied without a prescription by a Registered Qualified Person (RQP) i.e. a registered veterinary surgeon, a registered pharmacist or a suitably qualified person (SQP).

The RQP must check and be satisfied that the person administering the medicine has the competence to do so safely and that the use is necessary for the routine control or treatment of endemic disease.

To include: Some current P products, current PML products for pet animals (including horses which have been declared as not intended for human consumption) and MFSX products.

AVM-GSL (Authorised Veterinary Medicine – General Sales List)

Medicines which may be supplied by any retailer. These may be for non food producing animals or will be included in the exemption list for food producing animals currently being elaborated by the Commission.

**All antimicrobial products will be classified POM-V**

## **Responsible use of medicines in cattle production**

1. All antimicrobials used in the EU have been registered for their current uses on the basis that they are effective and safe to both man and animals. They reduce the suffering and distress associated with disease and speed recovery. Antimicrobials are sometimes used to prevent predictable disease incidence or at the outbreak of a disease in a herd to prevent in-contact infection (e.g. calf pneumonia, dry cow mastitis therapy).
2. Antimicrobials which are not of value in the treatment or prevention of diseases may not be used as feed additives from 1 January 2006, (Regulation (EC) No 1831/2003). The antibiotics flavophospholipol and monensin sodium were licensed as zootechnical additives to enhance performance (also called growth promoters or digestive enhancers). Used at low levels these improved the growth rate and efficiency of feed conversion in growing cattle.
3. The cattle industry recognises that human health must be the overriding consideration guiding antimicrobial use. The Responsible Use of Medicines in Agriculture Alliance (RUMA) is a coalition of organisations including agricultural, veterinary, pharmaceutical and retail interests. This guideline is one of a series of species-specific documents developed by RUMA. The main aims are to communicate practical strategies by which the need for use of antimicrobials might be reduced; and ultimately to enable a livestock producer to discontinue unnecessary antimicrobial use without adversely affecting either the welfare of his animals, or the viability of his business. RUMA fully supports the Government's Animal Health and Welfare Strategy and its Sustainable Farming and Food Strategy. RUMA seeks to promote responsible medicine use as an industry partner within these strategies.
4. Without good health, an animal's potential cannot be fully expressed. Health is essential for efficient performance and disease control is a key element of any successful management programme. Treatment of disease is not as effective or as economical as prevention. Poor health status and subclinical disease can be a major cause of losses in all forms of dairy and beef production, including organic production. Many disease conditions can be avoided or minimised by using management practices that minimise exposure to disease, reduce stress, and include good hygiene and vaccination programmes. Key management areas are highlighted in these guidelines.
5. Cattle farmers and their veterinary surgeons aim to ensure that animals are kept in the best state of health and welfare. This must be viewed against a backdrop of a sound commercial base and the economics of the business but never compromised by it. The medicinal use of antimicrobials on all farms is under the supervision of the veterinary surgeon. It is a legal requirement for farmers to keep a record of the administration of medicines, including in-feed medication, which must be available for inspection. Farm Assurance Schemes audit compliance with the legislation. Farmers and veterinary surgeons have a shared responsibility to ensure that medicines are used responsibly.

## **RUMA Guidelines**

The use of animal medicines carries with it responsibilities. Under UK legislation, all antimicrobials are licensed for specific species and uses.

A product will not be authorised unless very stringent requirements are met. The use of therapeutic antimicrobials is under the direct responsibility of veterinary surgeons.

Farmers, however, have a very considerable role to play in ensuring that the directions of the veterinary surgeon are properly carried out and also in developing and applying disease control measures which minimise the need for antimicrobial use.

- There is a joint responsibility between the veterinary surgeon and the farmer to ensure that antimicrobials are used correctly and for the right reason. Ultimately, it is the farmer who is responsible for ensuring that animal medicines are used in a safe, responsible and effective way on the farm.
- Dairy and beef farmers are committed to ensuring the safety of food they produce for consumers.
- Farmers have a responsibility to safeguard the health of the animals on their farm
- Therapeutic antimicrobial products should be regarded as complementing good management and farm hygiene. Herd health plans should be drawn up and include routine preventative treatments (e.g. routine foot care, mastitis, vaccination and worming).
- Treatment should be initiated with a medicine that is subject to veterinary prescription only with formal veterinary approval. Accurate information, including other medicines being administered, should be given to the veterinary surgeon to allow correct diagnosis and appropriate medication and dosage. Clear instructions must be left on the farm and made available to all staff responsible.
- The full course of treatment at the correct dosage should always be administered.
- The appropriate withdrawal period prior to slaughter, or for the sale of milk for human consumption, must be ensured. Information on the required withdrawal period can be found on the medicine labels.
- An animal medicines record book together with copies of relevant regulations and Codes of Practice must be kept on the farm.
- Accurately record the identity of the treated animals, the batch number, amount and expiry date of the medicine used, plus the required withdrawal period and the time and date the medication was completed for any specific animal. Appropriate information should be kept on file of medicines used (e.g. product data sheets, package inserts or safety data sheets). Records must be kept for a period of five years after the treatment has ended even if the animal has been slaughtered.

- Medicines must be stored according to the manufacturers' instructions. Unused or unwanted medicines must be disposed of according to manufacturers' instructions or returned to the veterinary surgeon or supplier for safe disposal.
- Any suspected adverse reactions in either the animals undergoing treatment or the staff treating them, should be reported to the Veterinary Medicines Directorate (VMD). Adverse reaction forms can be found on the VMD's website at [www.vmd.gov.uk](http://www.vmd.gov.uk). A report can be submitted by the farmer or the attending veterinary surgeon. Keep a note in the medicines book or a copy of the VMD's adverse reaction report if available.
- Cooperate with Farm Assurance Schemes that monitor medication and withdrawal compliance. However, such schemes should not constrain the farmer from preventing the suffering of animals.
- Work with the veterinary surgeon in monitoring the potency of antimicrobial use.

### **Farm Guidelines**

There should be written instructions on each farm outlining the farmer's obligations in law concerning his use of medications including antimicrobials. It should cover:

- Storage
- Administration techniques
- Recording
- Withdrawal periods

Part of the instructions should be specific to the farm including:

- The correct dosage and duration of medication
- The correct indications for use
- The correct procedures for ensuring adequate withdrawal periods

All of which is to ensure the accuracy of medication of animals at the anticipated site of infection.

### ***Integration with Herd Health Programme***

These written instructions should be in conjunction and co-ordination with a written Herd Health Programme tailored to meet the needs of the farm and emphasising those areas of management that are likely to reduce the requirement to use medication.

### ***Review***

There should be a written procedure for a regular periodic review of the medication prescribed to provide the opportunity to reassess the efficacy of treatment (treatment = medication + management) after this review, and where appropriate. Medication should either be stopped or reduced in duration.

Any suspicion of adverse reactions or evidence of bacterial resistance should be thoroughly investigated through the support of in vitro bacterial sensitivity testing with the medication changed appropriate to these findings.

### **Responsible Use - Veterinary Surgeons**

1. The Royal College of Veterinary Surgeons Guide to Professional Conduct makes specific and detailed reference to the use of pharmaceutical products. In 1998 the British Veterinary Association published their Code of Practice on Medicines. The challenge to the veterinary profession is to ensure that the new codes of practice are effective and properly implemented. The British Cattle Veterinary Association runs a pharmacy course for veterinary surgeons. Every veterinary practice should aim to ensure that at least one member has completed the Pharmacy course. The British Cattle Veterinary Association has also produced the BCVA Herd Health Plan plus guidance notes for the purposes of Farm Assurance. The pharmacy course is now run by the divisions BCVA, SPVS and BSAVA.
2. Antimicrobials may only be prescribed and used under the direction of a veterinary surgeon when:
  - a. the veterinarian has been given the responsibility for the health of the animal or herd in question by the owner or the owner's agent
  - b. the care of the animal or herd by the veterinarian is real and not merely nominal

Although circumstances will vary enormously the veterinary surgeon must at least: (a) have either seen the animal for the purposes of diagnosis or prescription; or (b) have visited the farm or other premises in which the animal or herd is kept sufficiently often and recently enough to have acquired from personal knowledge and inspection an accurate and up to date picture of the current health status on that farm sufficient to enable him or her to make a diagnosis and prescribe for the animal or herd in question.

3. In all uses of antimicrobials the best available information should be used to determine treatment, the most prudent regimes and dosages. The veterinary surgeon should perform post-mortem examinations, serology, farm visits and other relevant laboratory investigations where necessary. The aim is to provide optimal efficacy with minimal risk of resistance developing in either the target organisms, potentially zoonotic organisms, or organisms capable of transmitting resistance to pathogens. The veterinary surgeon will be the normal source of such information for the farmer.

4. All available practice information should be consolidated into one form or database, such that this information should:
  - Allow monitoring of the level of medication used
  - Contain a list of those medicines supplied to each farm
  - Contain a list of medicine withdrawal periods and a system for allowing information to be updated
  - A record of antibacterial sensitivities
  - Any comments concerning the response of medication under these circumstances

Any suspicion of adverse reactions or evidence of bacterial resistance should be thoroughly investigated with the support of in vitro bacterial sensitivity testing and the medication changed appropriate to these findings. Suspected adverse reactions should be reported to the Veterinary Medicines Directorate through the Suspected Adverse Reaction Surveillance Scheme (SARSS).

### **Responsible Use - Farm Assurance Schemes**

1. Farm assurance schemes have a very important role to play in promoting the responsible use of antimicrobials on farms. Credible farm assurance schemes with a credible inspectorate are essential if the industry is to reassure consumers. Farm assurance scheme assessments and audit trails should be consistent.
2. Farm assurance schemes often require farmers to nominate a veterinary surgeon or veterinary practice. Veterinary surgeons prescribing medicines are in a position to certify compliance with the standards of the farm assurance scheme in relation to antimicrobial usage providing the animals were actually under his care and he was aware of all products used on farm. Keeping records of medicine use whether or not medicines are prescribed and supplied by the veterinary surgeon is already a legal requirement on all farms in the UK. The VMD Code Of Practice On The Responsible Use Of Medicines should be adopted by the industry as a minimum standard.
3. Veterinary surgeons play an important role in farm assurance schemes while recognising the expertise of the farmer in managing his own livestock. A Herd Health Plan must be devised for the purposes of Farm Assurance where necessary with the assistance of a nominated veterinary surgeon. Regular and frequent review of the Herd Health Plan is recommended. It is recognised that the frequency of the review will vary according to the situation and the requirements of the particular farm assurance scheme.

4. The standards of the National Dairy Farm Assurance Scheme detail the responsibilities of stockmen for the safe use, storage and disposal of medicines. The herd health section of the National Dairy Farm Assurance Scheme can be used as an introduction to a set of guidelines on the responsible use of antimicrobials along with all other medicines. The herd health section of the National Dairy Farm Assurance Scheme includes a requirement to keep a herd health plan which should show routine preventative treatments (e.g. routine foot care, mastitis 5 point plan and vaccination and worming programmes).

## **Practical strategies for reducing the need to use antimicrobials on beef and dairy farms**

### **1. Introduction**

- a. For a specific disease to occur, certain combinations of factors involving the animal, the environment, and the disease agent must be present. Proper manipulation of nutrition, husbandry practices, and the environment will help to prevent disease. There are at least two reasons to give cattle proper care. One is an ethical concern for the animal's well-being. Another is production efficiency. Management practices that incorporate good animal care are usually also the most effective from a production standpoint. When cattle receive good care, production costs are less than when they are not well cared for.
- b. If certain management practices conflict with the well-being of the animals, it will be to the producer's long-term advantage to adopt practices that put the animals' welfare ahead of short-term cost savings.
- c. The health of cattle and the incidence of disease are directly affected by other areas of management. A high level of nutrition promotes general animal health and prevents many health problems. Farmers should know about the stresses, diseases, parasites and other health related conditions that may be unique to their area and especially to their specific operations. Disease control measures related to genetics and pasture management also deserve attention, especially when controlling health problems.
- d. Veterinary surgeons ensure that animal diseases are properly diagnosed and help to design preventive programmes. Farmers should therefore consult their veterinary surgeon when they require a diagnosis of disease in their animals or when they need to design or modify a preventive disease programme. Disease prevention resulting in increased levels of health and performance must be made a part of a total management programme.
- e. These guidelines are designed to help farmers evaluate their husbandry procedures with respect to the well-being of their animals. Proper management yields benefits to both the cattle and to the farmer.

## 2. **Disease prevention**

The best way to prevent disease is to prevent it from entering the farm. It is important to develop a preventive medicine programme and consulting with those who have additional expertise and experience in the use of medicines to prevent disease may assist this.

### ***Biosecurity***

- a. Biosecurity is a herd management strategy designed to minimise the potential for introducing disease-causing organisms onto the farm or its buildings. People, animals or wildlife may transport diseases from outside the herd.
- b. From a health standpoint, it is important to remember that disease can spread from cattle and sheep on neighbouring farms. Attention should be given to the location of the farm, prevailing winds and the likelihood of accidental exposure to other cattle, sheep or wildlife. Domestic pets that have been exposed to other animals may also be a concern. Good perimeter fencing will discourage people and stray animals from entering the farm.
- c. Lorries that have visited other holdings may also carry disease organisms. All equipment and tools should be cleaned thoroughly after each use. Ideally animals should be loaded onto lorries near the perimeter of the farm so that livestock lorries do not drive across the farm.
- d. Ideally, visitors and vehicles from outside the premises should be cleaned and disinfected before going on the farm. Keep disinfectants available for those who must come onto the farm.
- e. Movement of animals to and from auction markets and shows must also be considered a potential risk.

### ***Adding new stock to the herd***

- f. Purchase healthy stock from reputable sources. The best way to prevent having to deal with a specific disease is to never introduce it onto the farm. Incoming stock must not have diseases new to the herd. Certification schemes for several of the major cattle diseases e.g. BVD, IBR, Johnes Disease and Leptospirosis have been developed. Try to avoid mixing animals from several sources. Make sure that animals are properly identified and delivered in a clean disinfected truck.
- g. When possible, quarantine all incoming stock, particularly breeding stock, for at least three weeks. Longer periods -- 30 to 60 days -- offer even more security. Try not to expose calves to new animals.
- h. The quarantine period is used to observe the stock for any signs of illness. Clinical signs of illness disqualify the stock from addition to the main herd. Farmers should, if practical, try to notify the owners of the receiving farm if a disease outbreak should occur on the source farm during quarantine period.

- i. During quarantine, the animals can be tested for any diseases that may be of concern depending on the source of the stock. If the vaccination status of new animals is unknown the new animals should be vaccinated. Vaccination should be based on the prevalence of diseases in the area and the risk of contacting the organisms involved e.g. clostridial diseases, leptospirosis. Efforts should be made to establish the previous vaccination history. New animals should also be treated for internal and external parasites.
- j. Other methods for introducing new genetic material onto farms include the use of artificial insemination (AI) and embryo transfer (ET). Used properly, both can be useful for introducing new genes while minimising disease transmission risks.

**Table 1. Procedures to perform on incoming stock during the quarantine period.**

<b>Procedure</b>	<b>When to perform</b>
Observe for illness	Entire quarantine period
Serological tests?	14 days after arrival
Vaccinate for clostridial diseases, leptospirosis?	On arrival and two weeks later
De-worm and treat for lice	On arrival

**3. Routine health procedures**

- a. Because of the prevalence and impact of specific diseases, a vaccination programme is usually practised. Stringent prevention programmes involving biosecurity practices and the routine isolation and quarantine of new animals, combined with routine surveillance and action when necessary, are the best health procedures.

**4. Vaccination programme**

- a. Vaccination against diseases that are present in the area protects cattle from death, illness, and suffering and increases profitability. Vaccination programmes should be designed for individual herd situations. Proper diagnosis of health problems in sick animals and post-mortems on animals that die are excellent methods of updating a vaccination and preventive medicine programme. Proper storage and administration of vaccines are essential if they are to be effective.

- b. Vaccination is a powerful tool for controlling disease on farms. The use of vaccine has the ability to reduce the production losses associated with many diseases. Vaccines have two major effects. The primary benefit is to the animals that are vaccinated, as they are less likely to become diseased. These animals can therefore withstand disease challenges and perform better. The secondary effect of vaccination is on the herd. As the immunity of the individuals rises, fewer infectious organisms are shed. This further reduces the presence of disease on a farm, effectively raising the health of the total farm population.
  - c. Vaccines are available for a number of diseases that affect cattle. In some cases, vaccination constitutes the major part of the control of the disease. In many other cases, it is only a small part of the control programme. Vaccination programmes should be tailored to each farm and can be developed in consultation with the farm's veterinary surgeon. Remember that vaccination only raises an animal's level of resistance. If other important management procedures are neglected, even this elevated level of resistance may be inadequate to prevent disease.
  - d. Vaccines must be stored and administered according to label directions if they are to be effective. In most cases vaccines will need to be stored in a refrigerator. Refrigerator temperatures should be monitored. Withdrawal time to slaughter must be observed at all times to avoid residues. The most common times for administering many vaccines are before breeding and before parturition. This protects the dam and passes antibodies to the offspring for their protection.
  - e. Vaccines are available for the major respiratory pathogens of cattle and should be used where there is a history of viral pneumonia on farms. Where diagnostic tests are carried out the farm's veterinary surgeon will be able to advise on a vaccination strategy based on the farm history of such tests. Other vaccines should be evaluated on the criteria of risk of disease, cost and effectiveness.
  - f. The basic vaccination programme may need to be modified for an individual farm situation, and timing may be changed to fit exposure and other challenges unique to a farm or season.
5. **Internal and external parasite control**
- a. Successful parasite control and prevention programmes require planning. Controlling internal and external parasites promotes animal health. Treatment with antiparasitic medicines will usually stop death loss and cases of acute parasitism. However, unless this is part of a strategic programme, animals are often reinfected almost immediately by infective larvae and their worm burdens may return to near pre-treatment levels. Therefore, each programme should have as a goal the elimination of chronic subclinical parasitism and environmental contamination.

- b. Attention must be given to good management as well as judicious use of anthelmintics for any programme to be successful. Farmers should read and follow the label directions to assure an effective programme and to avoid residues.
- c. All incoming breeding stock should receive treatment with external and internal parasiticides. Monitoring faecal samples regularly from each production area can help to determine the presence of internal parasites allowing further refinement of the deworming programme.
- d. Animals in all phases of production should be observed routinely for signs of external parasites. An external parasite control programme should be designed based on the results of the monitoring.

## 6. Mastitis

- a. Mastitis control is essential to the production of milk of acceptable quality in accordance with EU Directives. Mastitis is caused by bacteria. The use of antimicrobials during lactation to control the spread of infection and reduce pain and inflammation is recognised as essential on welfare grounds. Treatment should be prompt and the predisposing causes investigated. The use of antimicrobials in the treatment of mastitis should follow strict prescribing practice with bacterial isolation and sensitivity testing, if appropriate, being carried out on a regular basis to confirm the identity of the pathogen responsible. Constant monitoring of response to treatment and accurate recording of clinical cases are essential aids to mastitis control. Good stockmanship is extremely important in monitoring mastitis and antimicrobial usage.
- b. Success in mastitis control has largely resulted from the application of the principles associated with the “6 point plan” which includes: post-milking teat end disinfection (teat dipping); dry cow therapy; proper maintenance and operation of milking machines; culling; therapy of clinical cases when they occur; and hygiene in the environment. These procedures were developed to control the contagious mastitis pathogens in dairy herds. Teat dipping, total dry cow therapy and culling have been the primary factors responsible for the marked reduction in the prevalence of mammary quarters infected with the contagious pathogens *Streptococcus agalactiae* and *Staphylococcus aureus*. The marked reduction in prevalence of contagious pathogens has in turn been responsible for the dramatic decreases in herd bulk milk somatic cell counts (BMSCC) that has occurred over the past 30 years.
- c. It is important that all clinical and subclinical cases of mastitis are recorded. Clinical mastitis records must be accurate and should be kept for a minimum of two years. Records should include the date; cow ID; quarter; clinical signs; treatment; date of last treatment; date to which milk withheld; and any other notes. All other treatments and dry cow therapy should also be recorded.

- d. The different environments on dairy farms generally influence teat-end exposure to environmental pathogens: 1) the calving area; 2) the environment of lactating and dry cows; and 3) milking parlour or milking time hygiene. Clean, dry conditions should be emphasised in all areas of the dairy cow's environment. Bacteria require food, moisture, and proper temperature to survive and multiply. Eliminating moisture may be one of the more productive ways to reduce the number of environmental pathogens and cases of environmental mastitis in the dairy herd. It has been suggested that overstocking may sometimes lead to an increase in the incidence of environmental mastitis.

***Post-milking teat end disinfection (teat dipping)***

- e. The primary means of reducing exposure of teat ends to the contagious pathogens is post-milking teat dipping. Good post-milking teat dipping with a bactericidal teat dip is essential to mastitis control in dairy herds. Teat dips are applied by either dipping the teat in the product or by spraying the product onto the teat. Teat spraying can be an effective means of applying teat dips but teat spraying is frequently found to result in less than adequate coverage of the teats and has been associated with a rise in contagious pathogen infections and BMSCC in some herds.
- f. The two primary objectives of teat dipping are to prevent mastitis and to enhance teat skin condition. Two factors can inhibit effectiveness: improper application and ineffective formulation. Farmers should demand proof of effectiveness before purchasing any teat spray - use only teat sprays which have proven effectiveness. On-farm mixing of teat dips can reduce effectiveness. Water quality, wrong dilutions and improper mixing can reduce bactericidal activity. Only use products authorised for use by the VMD.
- g. The amount of time after cup removal before teats are challenged is important. The effectiveness of teat dip is reduced when teats are exposed to manure and mud shortly after cup removal. The teat end closes on the outside first and then progresses inwards. This mechanism for teat closure following milking can trap environmental pathogens inside the distal portion of the teat canal. Teat dip needs to be applied immediately after removal of cups.

***Dry cow therapy***

- h. Dry cow therapy (DCT) has two main functions: to cure existing intra-mammary infections and to prevent new dry period intra-mammary infections. DCT is also associated with more rapid teat canal closure in early dry period. Most dry period infections develop in 'open teats'. All cows can be treated at drying off or the use of targeted dry cow therapy can be considered. This involves the treatment of cows with dry cow therapy following selection on the basis of higher than average cell counts, and / or more than one case of clinical mastitis in the same quarter during the previous lactation. The criteria for selection should be established in conjunction with the veterinary surgeon on farm and will be specific to the problem within the herd.

- i. The antimicrobials contained in dry cow preparations are incorporated in slow release bases. As the cow is not being milked the antimicrobial is not being diluted nor is it removed from the udder. Continuous contact between the antimicrobial and bacteria in the udder maximises the effect of the antimicrobial. The advantages of dry cow therapy are:
  - reduces sub clinical infection. Treatment is more successful during the dry period - it is the most cost effective and there are better cure rates.
  - reduces somatic cell counts - financial penalties are imposed for high somatic cell counts.
  - helps prevent new infections during the dry period.
  - less mastitis in early lactation and around calving.
  - improvement in milk quality and production in the following season.
- j. Time should be taken to make the correct decisions and administer the treatment properly. An SOP for infusion of intramammary treatment is at Appendix B. See also Appendix C which gives guidance on the responsible administration of an injectable product. Cows with a history of mastitis outbreaks or visible damage to the udder may be earmarked for culling. The preferred method of drying off is simply to stop milking the cows, restrict the feed but ensure an adequate supply of water. If there are mastitis problems just prior to drying off it is a good idea to take some samples and have them checked for sensitivity to antimicrobials so that the most effective dry cow product can be selected. It may also be necessary to define protocols with the farm vet for the use of parenteral antibiotics during the dry period to increase cure rates. Ideally samples should be taken from new cases of mastitis. There is little point in sampling milk if the quarter was treated less than a week to 10 days earlier.
- k. It is important to remember to check the withholding time of the dry cow product especially for cows that calve earlier than expected to avoid any antimicrobials residues in the milk after calving. Dry cow products state a Minimum Dry Period, that is the minimum period between infusion of the product into the dry udder and the calving date. The withdrawal period is the time for which milk must be discarded following a dry period which is at least as long as the Minimum Dry Period. If the cow calves before the end of the Minimum Dry Period the total withdrawal period must be extended to include the remaining part of the expected Minimum Dry Period plus the milk withdrawal.

***Maintenance and operation of milking machines***

1. The importance of the milking machine is in relation to sub-clinical mastitis cannot be over emphasised. Studies carried out both in Scotland and in the Veterinary Research Laboratories in Northern Ireland have shown that 68%-75% of milking machines were faulty in high cell count herds, the commonest faults being: 1) insufficient vacuum reserves 2) vacuum fluctuation 3) too high a vacuum due to faulty regulator. It is important that vacuum levels are set to the level appropriate to the system in use. Veterinary surgeons and machine

fitters should be consulted for advice.

- m. Milking machines should be tested at least annually. Faults can still develop between tests. It is worthwhile doing a regular check to make sure the vacuum regulator is ‘hissing’ steadily other than when clusters are being changed. Check the vacuum gauge regularly as well - but remember it can be faulty. A blocked regulator can allow the vacuum level to rise up off the scale! Even a 2 kPa rise can be too much for the cows’ teats to take. Check liners regularly for cracks and other defects. Liners must have tension to provide a proper pulsation, so adjust if necessary. Seek advice when replacing liners and make sure that the liner is suitable for the shell. Note the date that liners were changed and replace in line with recommendations. (See the guidelines in NDFAS)

### ***Culling***

- n. Culling chronically affected cows is an effective means of reducing the reservoir of infection in a herd. Cows with a history of mastitis outbreaks or visible damage to the udder should be earmarked for culling. All cows with a lactational somatic cell count average over 500,000 cells/ml or that had more than three cases of mastitis during that lactation should be considered for culling, depending on age and previous mastitis history. Culling of non-responding cases may be an option of last resort in some cases. Cows with chronic recurring mastitis cases or high somatic cell cases that had dry cow treatment the previous year should be culled.

### ***Guidelines for treatment***

- o. Prompt and effective treatment of mastitis is a crucial part of any mastitis control programme.
  - identify early
  - strip as often and as completely as possible
  - treat using a complete course, particularly in heifers. Label instructions should always be read and followed completely regarding dose, frequency and timing of use, and withdrawal periods. Courses of treatment should be completed even if the milk returns to being visibly normal before completion of the prescribed course of treatment, to clear the bacterial infection.
  - culture some typical pre treatment cases from the herd to identify the organisms causing the problem and their sensitivity to antimicrobials. Samples can be frozen for up to 6 weeks. Glycerol can be included in the sample pot to enhance keeping quality of the frozen sample
  - if clinical cases stop responding or respond more slowly get more pre treatment samples checked for bacterial identification and sensitivity

- p. Samples can be taken from cows with mastitis that have not been treated with antimicrobials within the previous 7-10 days so that the organism and its sensitivity to antimicrobials can be identified at the laboratory. Ideally samples should be taken from new cases of mastitis. It is important to avoid contaminating samples with organisms from the environment. Keep the sample in the fridge or in a cool place and send to the laboratory as soon as possible.
- q. The aim of treatment is to ensure :
  - A rapid return to visibly normal milk
  - Rapid return to normal health and milk yield of the cow if systemically ill
  - No threat to the production of finest quality milk at the farm gate, i.e. rapid return to low bacteria and cell counts and no antimicrobial residues when milk from the affected cow is returned to the bulk supply.
- r. In order to select the most appropriate treatment regime a sufficient range of clinical and/or subclinical cases should be cultured and the sensitivity of the organisms determined. Other factors which have to be considered before considering treatment include the severity of infection, degree of inflammation, presence of postparturient oedema, and presence in one or more quarters. Farmers and vets should agree a defined treatment protocol within the health plan along with guidelines on identification of cows that are systemically ill that should be examined by a veterinary surgeon.
- s. Segregation of cows with clinical mastitis and high SCC cows is usually impractical if not impossible under grazing conditions. If possible, these cows should be ‘cut out’ immediately prior to milking. Milking these cows last would reduce risk of contaminating herd mates. Segregation or use of separate units for cows known to be positive for *Staph. aureus* can be an effective control on the spread of mastitis. Effective treatment of clinical cases, with appropriate ‘quarantine’ of their milk so as to minimise cross contamination to other cows during the milking process will remain one of the most effective means of controlling the spread of mastitis.

## 7. Lameness

- a. The stresses of late pregnancy, calving and early lactation interfere with hoof growth, hooves are softer as a result of the winter conditions, settling heifers into the main herd and rain damage to the surface of farm tracks all contribute to a higher incidence of lameness. Try to identify any contributory factors and remedy them. Poor farm track maintenance and the impatience of stockmen have been identified as major factors contributing to an increase in herd lameness. Cows can negotiate most track surfaces safely if allowed to drift, because they have their heads down looking for where to comfortably place their front feet. Each surface has its own safe walking speed. Where tracks are poorly maintained, unstable areas develop where coarse material may be exposed. Cows will try to avoid these “danger spots”. Congestion occurs at

the troublesome point as the front cows slow down or stop to reorganise in order to get past the congestion point.

- b. Treat all cows as soon as lameness is noted and minimise walking distances until sound again. Most lamenesses are in the foot. Interdigital necrobacillosis (foul in the foot) which is characterised by inflammation and swelling of the foot is one of the few conditions likely to be responsive to systemic antimicrobials. Digital dermatitis which is characterised by acute lameness with varying degrees of circumscribed dermatitis classically at the bulbs of the heel responds to topical antimicrobial rather than systemic. All lame feet should be checked before using antimicrobials. Check between the toes for stones and foot rot. If there is no evidence of infection there will be no response to antimicrobials. Hoof trimming is an important part of routine foot care as well as often being necessary to make a diagnosis and as part of treatment of lame animals. Consider using a footbath to increase hoof strength. Every effort should be made to control lameness, as it can be a serious welfare problem. If the cause of lameness is not clear, normal treatments are not working or the animal is severely lame veterinary help should be sought on welfare grounds.

## 8. **Retained placenta**

- a. Where cows do not pass their placenta (afterbirths, cleanings) within 24 hours of calving no immediate action is required in general unless there are other signs of illness (dull, depressed, not eating, raised or lowered body temperature - normal range 37.8 - 39.2°C). In general the retained placenta can be left in a healthy cow for 7 to 10 days before calling the vet to attempt to remove them. The hanging portion can be cut to improve hygiene in the milking parlour. Sick animals should be treated promptly. Milk from animals with a uterine discharge should not be used for human consumption.

## 9. **Health management of calves**

- a. Feed colostrum -- the sooner the better! The first hour after birth is optimum but they should all receive colostrum within six hours of birth. Newborn animals that receive adequate amounts of colostrum are far less susceptible to scours and other diseases. Make sure that newborn calves suckle, or administer stored colostrum in a nipple bottle or with an oesophageal feeder. Quality colostrum collected on-farm is better than the commercially available substitutes.
- b. For some of the scours that are a potential problem in calves the cows can be vaccinated during pregnancy to raise colostral antibodies. Accurate diagnosis is important for determining prevention and treatment procedures.
- c. Treatment for scours is very similar regardless of the cause. It should be directed toward correcting the dehydration, acidosis, and electrolyte loss. Antimicrobial treatment can be given simultaneously with the treatment for dehydration but is not always necessary. Dehydration can be overcome with simple fluids given by mouth early in the course of the disease. If dehydration is allowed to continue, intravenous fluid treatment becomes necessary.

- d. Keep daily records on the treatment administered and a record of the calves treated. This aids in evaluating the treatment and using follow-up treatments as necessary. If an outbreak of scours occurs, persistent treatment and records are essential for doing a good job.
- e. Scour problems are an ever-existing threat to young calves. A good programme of adequate nutrition, management, cleaning and disinfection and a good herd health programme are necessary to minimise the incidence and losses. Early diagnosis and treatment will reduce the threat of a herd outbreak. The correct diagnosis is also very important when considering vaccinations and other procedures for the cow herd the next calving season.
- f. Ear tag calves to identify as per current legislation. Keep and use records of cow-calf pairs and their health history.

#### 10. **Enteritis and pneumonia in young cattle**

- a. Management practices are important in the prevention and control of enteritis and pneumonia, especially in terms of vaccination and housing, including appropriate disinfection routines and adequate ventilation. In the treatment of scours good management and the use of electrolyte solutions often removes the need for antimicrobial usage. Good management and the use of appropriate vaccines often remove or significantly reduce the need for antimicrobial usage in the treatment of pneumonia. Early diagnosis of pneumonia and effective treatment helps to limit the spread of pneumonia within groups of cattle and should also reduce the effects of pneumonia in individual animals. Particular attention should be given to options for improving ventilation when pneumonia occurs. It is important to accurately diagnose the cause of the disease so that in consultation with the farm veterinary surgeon measures for treatment and prevention can be tailored for the agent responsible.

#### 11. **Monitoring**

- a. Animals should be observed at least daily for any sign of illness, injury, or unusual behaviour. Take time to walk through and observe animals on a daily basis and pay particular attention to those which are slow to move onto a fresh grazing area and those which stop eating earlier than others. Animals which are losing condition or failing to put on condition should be closely monitored. It is important to identify sick animals as early as possible as the stresses of calving and early lactation reduce their resistance to diseases. Prompt treatment is especially necessary for uterine infections and mastitis as these can rapidly become life threatening. Proper isolation facilities should be made available for the treatment of sick animals (NDFAS standards).

- b. Serological tests could be done for diseases common in the area where the herd is located. Diseases that can be monitored routinely include serology for BVD, Johne's Disease and IBR. Positive results must be correlated with clinical signs and farm history before specific recommendations can be made concerning the significance of the findings.
  - c. Bulk milk and individual cow cell counts can be used in the monitoring of udder infections in dairy herds. To a lesser extent Total Bacterial Counts may also be an indicator of the prevalence of infection.
  - d. Records of vaccinations and parasite treatments should be available to help detect health problems. These records do not need to be elaborate, yet are a valuable management tool. The more detail provided, the more likely that problems will be detected early.
12. **Environment**
- a. Insulation and proper ventilation of buildings will help prevent disease. Good ventilation and proper waste management will ensure acceptable air quality. Eliminate draughts and provide clean, dry lying areas for housed animals. Ensure that water of acceptable quality is available at all times. Shallow ponds, slow moving streams, and other wet places breed disease. Drain or keep animals away from such areas.
13. **Cleaning and disinfection**
- a. Cleaning and disinfection is the most basic and most important of all the disease control measures. Prompt and proper removal of wastes, and cleaning and disinfection of both equipment and the environment is central to disease control. Effective disinfection requires cleanliness first because the disinfectants have little or no action on dirty surfaces. The organic material in manure and dirt inactivates the chemical disinfectant. Also, dirt and manure provide protection for disease organisms and the chemical solution is unable to penetrate and reach them. Cold temperatures reduce the effectiveness of most disinfectants. The chemical agents commonly used require several minutes in contact with disease-producing agents to be effective.
  - b. Cleaning can be done with a shovel and a brush or speeded up by use of high-pressure washers and detergents or steam cleaners. When there is an excessive amount of manure or dirt present, the use of a detergent will speed up the job of removing the dirt by increasing the wetting speed, while a layer of water containing the disinfectant will remain on the surface to destroy the bacteria left after cleaning. Some detergents and disinfectants can be combined for easier one-step cleaning and disinfection.

- c. If possible allow surfaces to dry before using disinfectants. It is important to make up the disinfectant at the correct concentration – read the label. Add a measured amount of disinfectant to a known volume of water e.g. If the correct concentration of a disinfectant is 4% add 4 litres of disinfectant to 100 litres of water. It may help to have a barrel of known volume and a specific measuring container for the disinfectant.
- d. Avoid using a pressure washer to apply disinfectant if possible. Many disinfectants are corrosive and will damage a pressure washer. Try to apply disinfectant with a low pressure sprayer as this gives droplets that are more likely to cling to surfaces and have time to be effective.
- e. Disinfectants need time to kill micro-organisms. Follow the manufacturer’s instructions and rinse to remove residues if required. Allow sufficient time for the building to dry out completely before re-stocking. Many micro-organisms are killed by drying.
- f. Some detergents and disinfectants can be combined for easier one-step cleaning and disinfection. Steam is also an effective method of cleaning and reducing infection but the cleaner nozzle would need to be held not more than 6 to 8 inches from the surface to have much effect in killing organisms.
- g. Disinfectant foot-baths should be strategically placed and well-maintained. Maintenance is important as otherwise foot-baths may become a source of contamination rather than preventing transmission. Dilution by rainwater, wrong concentration and infrequent replenishing reduce the effectiveness of foot-baths. Disinfectants will be inactivated by the accumulation of faecal matter in foot-baths. Soiled boots should be cleaned thoroughly and all gross faecal material removed before using foot-baths. Disinfectants will not kill infective organisms that are protected within faecal matter.

**Table 2. Common disinfectants, their characteristics and uses.**

Active compound	Uses	Range of effectiveness	Disadvantages
Chlorhexidine	Equipment, premises, foot baths	Some bacteria and viruses, ineffective against parvovirus, pseudomonas	Reduced activity against certain organisms
Cresols, Phenols	Equipment, premises, foot baths	Variety of bacteria, limited effect on fungi and viruses, poor against bacterial spores	Strong odour with coal or wood tar distillates
Formaldehyde, other Aldehydes	Equipment, premises, foot baths	Variety of bacteria, bacterial spores, fungi and viruses	Irritating fumes
Iodophors	Cleaned equipment	Bacteria and fungi, limited effect on bacterial spores and viruses	Inactivated by organic material
Inorganic Peroxygen Compounds	Cleaned equipment & buildings	Many bacteria, viruses, fungi and spores	Inactivated by organic material

Quaternary Ammonium Compounds	Cleaned equipment	Variety of bacteria, limited effect on bacterial spores, fungi and viruses	Inactivated by organic material, neutralised by soaps
Chlorine, Hypochlorites, Chloramines	Cleaned equipment	Bacteria and fungi, limited effect on bacterial spores and viruses	Inactivated by organic material, may be irritating

**14. Pest Control**

- a. Pest management programmes are needed to control the infestation of pests on farms. Rodents, flies and some species of birds are the common environmental pests. In addition to being a nuisance, pests can be a vector for transmission of diseases. Entrance points in feed mixing and storage areas should be covered with screens or sealed to prevent entry by pests, and by cats and dogs. The elimination of breeding, roosting, and shelter sites will aid in pest control. Minimise contact between cattle and badgers.
- b. Only approved pesticides, properly applied, should be used in pest control. Guarding against any contamination of feed is essential to eliminate the possibility of unapproved materials being consumed by animals.

**15. Preventing Injuries**

- a. Animals can be injured in many ways. Good judgement must be used when designing and maintaining a safe environment for the animal. During the design process, it is necessary to think about potential problem areas, such as sharp corners, slippery concrete or improper spacings. Existing facilities should be routinely evaluated to ensure that they are safe for the animals. Farmers should check the facilities regularly, noting the condition of fences, pens and flooring and making necessary repairs. The key to preventing injury to both animals and employees is being observant.

**16. Disease treatment**

- a. In spite of good preventive medicine programmes and proper care, animals may still become sick or injured. Accurate diagnosis allows selection of the proper treatment and helps in deciding what management steps, if any, are needed to prevent the spread of disease in the herd. Where the diagnosis indicates the potential for disease spread sick animals should be isolated to minimise the spread. Isolation also makes it easier to observe and treat affected animals.
- b. Whenever possible, precise diagnosis of deaths should be attempted. This allows for a more rational choice of treatment as well as identifying steps that need to be taken to protect animals that have not been infected. When the presence of a specific pathogen has been established in the laboratory, antimicrobial susceptibility (sensitivity) tests can be conducted to aid in proper antimicrobial selection. These services (including post-mortem examination of dead animals) are available through veterinary surgeons and the Veterinary Laboratories Agency. Contact names and telephone numbers should be kept in a handy location.
- c. Sick animals should be treated promptly. When using medicines, it is essential

to read and follow the label instructions. A record of the product used, to include the batch number dose, duration of treatment, and period of withdrawal should be kept. A record of medicine usage is a legal requirement but it can also be useful in developing and documenting an adequate health care treatment plan.

- d. Medicines that are approved to be injected into animals or added to feed or water must be used only when absolutely necessary and where relevant, on advice by a veterinary surgeon and only as recommended by the manufacturer. Such products can help ensure the health and well being of animals and, when used strictly according to recommendations and regulations, will ensure a safe and wholesome product. Simple rules should be followed:
  - Label instructions must always be read and followed completely regarding dose, frequency and timing of use, and withdrawal intervals before marketing.
  - Treat all animals at the dose and for the duration recommended.
  - All medicines should be stored according to the manufacturers instructions. Those medicines requiring refrigeration should be identified and kept in an efficient working fridge. Temperatures within the fridge should be monitored.
  - Details of purchase, use and disposal of unused medicines should be kept.
  - Treated animals should be identified to ensure that withdrawal times are observed.
  - When in doubt, seek professional advice.
  - Do not use any product for which clear instructions are not available.
- e. A variety of effective compounds are available for external and internal parasite control that can be administered in several ways. Again, the specific ones used and the timing of their administration should be planned carefully. As with vaccines, parasite control compounds must be administered according label directions, and withdrawal times to slaughter must be strictly observed.
- f. Prompt and appropriate disposal of dead animals is important for animal and human health. Dead animals can be a source of disease for other animals. They should either be removed immediately by a licensed rendering truck or completely incinerated.

## 17. **Withdrawal periods**

- a. Withdrawal periods are only established after considerable research and are set for the purpose of ensuring consumer safety. The withdrawal period is the time between the last dose given to the animal and the time when the level of residues in the tissues (muscle, liver, kidney, skin/fat) or products (milk, meat) is lower than or equal to the Maximum Residue Limit. The Maximum Residue Limit (MRL) is the maximum concentration of residue resulting from administration of a veterinary medicinal product which is legally permitted in the Community or recognised as acceptable in or on a food.

- b. When medicines are used for food animals studies must be carried out to assess the time needed for any residues of a substance or its metabolites which may still be present in an animal's body to fall below the level shown to be safe. Once this has been determined, the withdrawal period is established. The withdrawal period is the minimum time required between the last treatment and the collection of meat or milk for human consumption.
- c. The National Office of Animal Health (NOAH) includes a table of 'withdrawal periods for animal medicines' in the back of the NOAH Compendium of Data Sheets for Animal Medicines. The marketing authorisation holder must always be the absolute reference point for any information on a specific product.
- d. Authorised products have stated withdrawal periods. Where products are used outside the data sheet recommendations e.g. the dosage is increased; the treatment period is increased; the interdose interval is shortened; the treatment is changed to another product or there is simultaneous administration of other antimicrobials by the same or other routes, then the veterinary surgeon should set a withdrawal period not less than the minimum of 7 days for milk or 28 days for meat.
- e. Farmers should inform the milk purchaser immediately if bulk tank contamination with antimicrobial is suspected in order to protect the public milk supply. Any bulk tank antimicrobial failures should be investigated to establish the cause so as to ensure that there are no further episodes. Evidence has shown that these arise usually as a result of the failure of on farm procedures. NOAH, together with the BCVA, have produced a form for the investigation of bulk tank antimicrobial failures.

## Summary

**A herd health plan including vaccinations and parasite control should be developed and reviewed and updated often where appropriate with the help of expert assistance including that of the veterinary surgeon. Basic disease prevention and control methods should be used to the greatest degree possible.**

### Keep disease out

1. Source of cattle: Only buy or bring in cattle from herds with similar or better health status. Quarantine newly introduced cattle and test for diseases where appropriate.
2. Vehicles: As far as possible keep vehicles outside the farm boundary – visitors, feed delivery, cattle delivery/collection, and especially CARCASE COLLECTION vehicles.
3. Minimise contact with other stock particularly at farm boundaries. Minimise contact with badgers. Control rats and mice. Keep birds, cats and dogs away from feed stores. Remove rubbish that provides potential breeding sites.
4. Visitors: Don't allow visitors near stock unless essential. Provide CLEAN overalls and boots and/or appropriate cleaning and disinfection facilities.

### **Keep disease levels down and stop spread**

5. Vaccination: Develop a vaccination programme in consultation with your vet and make sure that animals are vaccinated and receive boosters as agreed.
6. Water : Keep water system clean, use known safe water source, avoid watercourses.
7. Cleaning and disinfection: Thorough cleaning and disinfection between groups of animals. Keep passages, walkways, loading ramps and trailers clean and disinfected.
8. Farm tools and equipment: Remember that farm tools, tractors and equipment can carry disease between groups of animals. Clean and disinfect shared tools and equipment between groups especially when moving from older to younger stock.
9. Personal hygiene: CLEAN and disinfect boots and wash hands between groups of animals. Provide staff toilet with wash basin, always wash hands after use. Take care if staff have Salmonella-like infections.
10. Order of work: Start with youngest animals and work up through age groups, change overalls at end of day, wash hands, clean and disinfect boots.

### **Help the stock to help themselves**

11. Colostrum: Try to make sure all calves get enough colostrum
12. Feed: Feed an appropriate balanced diet. Keep all feed stores/bins pest proof. Clean and disinfect feed bins regularly. Only buy from certified sources. Check for spoilage and mycotoxins.
13. Environment: Eliminate draughts, provide adequate ventilation and avoid large variations in temperature.

RUMA 2005.

## **Appendix A - Antimicrobials in cattle production**

### **Treatment and prevention of disease**

A1. Microbial diseases cause pain, distress and economic loss. Authorised therapeutic antimicrobials reduce this suffering and distress and speed recovery in infected animals. Since the animal should not be allowed to suffer the alternative is to kill the animal. The removal of antimicrobials from veterinary medicine would cause great welfare problems.

<p>A2. The antimicrobials that are authorised for use in animals in the UK are detailed in the NOAH Compendium of Veterinary Data Sheet for Animal Medicines published by NOAH, and in the Handbook of Feed Additives published by Simon Mounsey Ltd. Withdrawal periods for veterinary medicines are set to ensure that any residue which may remain after treatment is harmless. Information on withdrawal periods is contained as a table in the back of the NOAH Compendium.</p>
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A3. The major antimicrobial exposure in cattle occurs during the treatment of mastitis, pneumonia and enteritis in calves. The next most common conditions for which

antimicrobials are used are periparturient problems in cows and lameness. A wide range of antimicrobials is used in the treatment of bacterial diseases in cattle. Treatment of groups of animals is generally only undertaken after diseases known to affect whole groups have been identified in a proportion of the group (e.g. calf pneumonia). Veterinary surgeons will always take a range of factors into account before deciding to prescribe antimicrobials and other forms of medication e.g. severity of disease in affected animals, definitive diagnosis, bacterial isolation and sensitivity if time scale permits, housing conditions, local farm knowledge and positive response to treatment.

- A4. Therapy usually involves an individual animal or group of diseased animals. Antimicrobials, used responsibly, are an essential element in the fight against animal disease. However, in animals, as in humans, a significant proportion of those treated for infectious disease would recover without antimicrobials but at the expense in many cases of welfare and productivity.
- A5. Antimicrobials are sometimes used to treat a group of animals to prevent diseases that might occur. In some situations when the proportion of animals diseased during a defined time period reaches a threshold value, all animals in the group are medicated as the probability of most or all of the animals getting infected is high.
- A6. In both treatment and prevention the drug is administered over a defined, preferably short, period of time and is prescribed by a veterinary surgeon.
- A7. Antimicrobials help prevent the spread of infection by reducing the bacterial burden in infected animals and may reduce zoonotic disease by reducing bacterial contamination in the food chain at source.
- A8. Antimicrobials are administered by the most convenient and effective routes. Sick cattle are usually treated individually either orally or by injection. In some rare situations individual treatment may not be feasible and mass oral medication is the only practical method of treatment.
- A9. A review has been published of the diseases of cattle most commonly requiring treatment including treatment with antimicrobials (Bennett R.M., Christiansen K.H. and Clifton-Hadley R.S. (1999) Direct costs of endemic diseases of farm animals in Great Britain. *Veterinary Record* (1999) **145**, 376-377.) The authors of the review admit that the availability of appropriate disease data was a limitation on the estimation of the direct costs associated with each disease. In addition only the direct costs associated with the impacts of disease on livestock production were considered and not wider economic impacts, such as the implications for human health, animal welfare and the effects on markets, including international trade. The data presented are the best present day estimate available but demonstrate the potential economic impact of disease on the industry and an indication of the costs of control. The estimates also indicate the likely scale of detriment to the welfare of cattle if antimicrobials were not available for treatment.

### **The use of antimicrobials as zootechnical additives**

- A10. Antibiotics, other than coccidiostats and histomonostats, may not be used as feed additives from 1 January 2006, (Regulation (EC) No 1831/2003). Where antimicrobials are used as zootechnical additives they are used at low levels. Some resistance may develop to the antimicrobials used even at these levels but at a much lower frequency than if they were to be used at treatment rates. Only antimicrobials which are not of value in human or animal treatment can be authorised for use as feed additives in the EU at present. The use of antimicrobials as zootechnical additives is strictly regulated and companies must demonstrate that they meet the following standards:
- They must be non toxic.
  - Performance must be improved with economic benefit.
  - There must be no adverse effects in relation to other antimicrobials.
  - They must not alter the bacterial flora in the gut, or allow one organism to predominate over another, for example, salmonella.
  - They must not pollute the environment.
  - They must not increase drug resistance
- A11. Monensin sodium and flavophospholipol were the only antimicrobials licensed for use as zootechnical additives in cattle production (not for milking or dry cows). Flavophospholipol and monensin do not appear from the literature to induce or co-select mutants with cross resistance to medical therapeutics. The use of these products in compounds is dictated by feeding rate.
- A12. The main zootechnical additive used in cattle in the UK was monensin sodium. Monensin sodium (Romensin) is an ionophore and has no medical equivalent. The use of monensin therefore has no implications for human medicine. Monensin controls bloat, coccidiosis and methane production as well as improving feed conversion. A healthy microbial population is essential for normal rumen function and the breakdown of plant material for digestion further down the digestive tract. Monensin greatly improves the ability of the animals to utilise their nutrition. The animals grow faster on less feed, resulting in more efficiently produced beef. Its usage is believed to have declined dramatically in recent years as a result of negative pressure on the use of growth promoters. Monensin sodium (Romensin) was licensed for improved feed conversion efficiency and/or weight gain in cattle except lactating dairy cows.

### **International perspective**

- A13. Resistance to antimicrobials is an international problem. Action by the EU on the basis of the precautionary principle cannot be enforced internationally. Imports of meat and dairy products from outside the EU may therefore come from animals that have been exposed to antimicrobials that are not authorised within the EU. There should be harmonisation of rules governing the use of medicines internationally.

## **Appendix B – Standard Operating Procedures**

### **B1. Administration of a lactating cow intramammary tube.**

- Milk out the mastitic quarter fully
- Use rubber gloves
- Clean and dry dirty teats
- Pre-dip (with proprietary pre-dip) and leave for 30 seconds
- Thoroughly clean and disinfect the teats with cotton wool soaked in 70% alcohol, paying particular attention to the teat ends
- Leave to dry
- Administer the antibiotic with care, using partial insertion of the tube end ensuring the utmost cleanliness
- Dip teats in proprietary post milking teat dip
- Record in medicines book
- Clearly note when milk can return to the bulk tank after the withdrawal period
- Identify cows once treated and notify all other persons likely to milk the cow to prevent contamination of the milk supply
- Consider using an antibiotic test kit to ensure milk is residue free prior to making milk available for sale.

### **B2. Administration of a dry cow intramammary tube or teat sealant**

Administration of dry cow therapy requires adequate time and the utmost care, and should not be done during milking.

- Administer after the last milking of a lactation, preferably after the other cows have been milked
- Use rubber gloves
- Clean and dry dirty teats
- Pre-dip (with proprietary pre-dip) and leave for 30 seconds
- Thoroughly clean and disinfect the teats with cotton wool soaked in 70% alcohol paying particular attention to the teat ends
- Leave to dry
- Thoroughly clean teats again with cotton wool soaked in 70% alcohol and leave to dry
- Administer the product with care, using partial insertion of the tube end ensuring the utmost cleanliness
- Always administer the first tube into the same positioned teat (e.g. front left), and proceed the same way around the udder (i.e. clockwise) to avoid missing one teat or double dosing teats
- Dip teats in a proprietary post milking teat dip
- Record in medicines book
- Identify cows once treated and remove from the herd to prevent accidental contamination of the milk supply

- Keep treated cows standing in loafing areas for approximately 30 minutes to allow proper closure of the teat canal.

## **Appendix C – Responsible administration of an injectable product**

Intravenous injection of animal health products should only be undertaken by a Veterinary Surgeon.

Recommended Guidelines for Subcutaneous and Intramuscular Injections.

1. Ensure all injection apparatus is sterile before use. Check that the packaging of disposable syringes and needles is intact.
2. Maintain cleanliness at all times.
3. Keep needles sharp and clean; replace frequently.
4. Use needles of appropriate gauge and length. For subcutaneous administration, use shortest needle possible, certainly not exceeding 25 mm (1 inch).
5. As far as possible avoid injection of animals in wet weather.
6. Intramuscular injections should be made into muscle tissue on the side of the neck.

Subcutaneous injections should be made under the skin high on the neck behind the ear.

The preferred injection site for both intramuscular and subcutaneous injections is the neck except for Calcium borogluconate or Magnesium sulphate where the preferred injection site is subcutaneously behind the shoulder.

Avoid carcass damage, especially of the cuts of meat with significant commercial value.

Also consider Worker Health and Safety implications of handling animals before and during the administration of the injectable product.

### **Workers**

Be aware of your work area surroundings

Identify an exit route should something occur

Be aware of uneven or changing walking surfaces or routes

Observe all potential hazards in the given environment

Work in a team, or if alone, advise someone of your location and how long you plan to be there

Clearly establish the team leader, roles and responsibilities

Evaluate the experience of those around you and help them to understand how their actions can impact safety

Keep children and bystanders out of livestock handling areas

### **Cattle Safety And Behaviour**

- Check that no other animals in the area pose a risk to the cattle handlers
- Properly restrain the animal before starting any procedure
- Use adequate facilities such as a squeeze chute and/or head gate
  - Remember separation from other animals can cause unpredictable behaviour
- Minimize handling stress
  - Avoid loud noises and quick movements
- Adjust your activity with the temperament of each individual animal

The Responsible Use of Medicines in Agriculture Alliance (RUMA) was established in November 1997 to promote the highest standards of food safety, animal health and animal welfare in British livestock farming.

A unique initiative involving organisations representing every stage of the food chain process, RUMA aims to promote a co-ordinated and integrated approach to best practice in the use of animal medicines.

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**RUMA is made up of the following organisations:**

*Agricultural Industries Confederation (AIC)*

*Animal Health Distributors Association (AHDA)*

*British Poultry Council (BPC)*

*British Retail Consortium (BRC)*

*British Veterinary Association (BVA)*

*Linking Environment and Farming (LEAF)*

*Meat and Livestock Commission (MLC)*

*National Beef Association (NBA)*

*National Consumer Council (NCC)*

*National Farmers Union (NFU)*

*National Office of Animal Health (NOAH)*

*National Pig Association (NPA)*

*NPTC*

*National Sheep Association (NSA)*

*Royal Association of British Dairy Farmers  
(RABDF)*

*Royal Pharmaceutical Society of GB  
(RPSGB)*

*Royal Society for the Prevention of Cruelty to Animals (RSPCA)*