



**ASSURING THE SAFETY, QUALITY & EFFICACY  
OF VETERINARY MEDICINES**



## **GOOD PRACTICE GUIDE**

# **Medication of Pigs via Liquid Feed**

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# Good Practice in the Medication of Pigs via Liquid Feed

The content of this document is considered to be good practice and you are encouraged to follow it.

## INTRODUCTION

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1. This document provides information on good practice to help veterinary surgeons and farmers with the oral medication of pigs in the UK that are fed via a liquid feed system. In this document, we have used liquid pig feed to mean porridge, meal and fully liquid feeds.

## BACKGROUND

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2. A significant number of farms are set up to deliver feed to pigs as a liquid feed. Due to the design of such farms, it is not usually practical to medicate the pigs using dry medicated meal or pellets. Also, because of the low intake of plain drinking water in pigs that are liquid fed, it is difficult to medicate these animals via their drinking water. There are a number of authorised veterinary medicinal products (VMP) where the required dose may be added to the feed of an individual pig. However, this is not usually a practical method of administration when a large number of pigs are housed together and it is necessary to treat the whole group as the disease could be transmitted to healthy animals. Consequently, in order to medicate liquid fed pigs it is usual to administer the medicine via the liquid feed.
3. There are currently very few medicines where there are data available to demonstrate that they may be used safely and efficaciously when administered in liquid pig feed and, therefore, very few medicines are specifically authorised in the UK for addition to liquid feed. In order to identify those products which are appropriately authorised for incorporation into liquid feed you can search for these on the VMD's website, using the product information database. You can search the database according to the active substance and/or the species and you will then need to check the contents of the SPC for the details concerning the authorised posology/method of administration. Alternatively, on the VMD website use the main search tool and insert the words "liquid feed" then select the tab marked SPCs and check the contents of the individual SPCs. The VMD is encouraging Marketing Authorisation Holders to generate the necessary data and obtain specific claims on their Summary of Product Characteristics (SPCs) for relevant products. Until this happens for a sufficient number of products, there will be unmet needs in terms of authorised medicines to deal with the all of the different disease situations. Therefore, veterinary surgeons often find it necessary to prescribe VMPs in liquid feed as:

- an in-feed veterinary medicinal product (VMP), which is authorised for addition to dry feed, or
  - a veterinary medicine authorised for administration via drinking water (which are referred to in the remainder of this document as water soluble VMPs).
4. Using in-feed and water soluble VMPs, especially antimicrobials, to medicate liquid feed which do not specifically state on their SPCs and labels that they may be administered in liquid feed, should be avoided, if at all possible, to ensure that the correct amount of medicine is consumed and that the risks of over-dosing, developing resistance or poor health through under-dosing are minimised. However, if a veterinary surgeon considers this type of usage to be necessary, then the following should be taken into account.

## USE IN ACCORDANCE WITH THE SPC AND CASCADE USE

5. Wherever possible VMPs should be used in accordance with their SPC and label instructions. The prescribing cascade may be used when there is no authorised VMP in the UK for a condition. This means that if a clinically suitable product is authorised for use in liquid feed, then this should be the first choice of treatment before resorting to using a product which has no specific recommendations for inclusion in liquid feed. A veterinary surgeon may though under their own responsibility prescribe, according to the cascade, the use of a product which does not correspond to the clinical guidance in the SPC. Where this happens the animal owner should be informed. The following table is intended to illustrate examples where products are considered by the VMD as being used in accordance with the SPC and where the use corresponds to use under the cascade.

	<b>Use in accordance with SPC</b>	<b>Cascade use</b>
<b>In-feed VMPs</b>	Addition of a VMP directly or indirectly to a co-product liquid feed where the SPC specifically states this is permitted.	Addition of a VMP directly or indirectly to a co-product liquid feed where the SPC does not specifically state this is permitted.
	Addition <sup>1</sup> to complete meal at the mill, followed by addition to water at the farm directly prior to feeding.	Addition <sup>1</sup> directly to liquid feed where the product label makes no such recommendation.
	Intended dose mg/kg bodyweight corresponds to that specified on the product label of the VMP.	Intended dose mg/kg bodyweight differs from that specified on the product label of the VMP.

<sup>1</sup> Addition means incorporation in this instance

		Addition of VMP to a dry balancer meal/complementary feed (premixture) designed to balance the nutritional profile of liquid co-products and which is mixed with the co-products directly before feeding.
		Addition of VMP to a mineral based premixture (no cereals, soya etc) for incorporation into co-product based liquid feed directly before feeding.
<b>Water soluble VMPs</b>	Addition <sup>1</sup> of water soluble VMP to water at the farm and then addition to complete meal directly prior to feeding.	Addition <sup>1</sup> of water soluble VMP to water for further addition to liquid feed, or directly to liquid feed
	Intended dose mg/kg corresponds to that specified on the product label of the water-soluble product.	Intended dose mg/kg bodyweight differs from that specified on the product label of the water-soluble product.

6. The table also applies to the addition of VMPs via premixtures (a premixture is a mixture of a VMP (or a specified feed additive) with feed materials that is intended for further mixing with feedingstuffs before being fed to animals).
7. Where there is no suitable UK authorised VMP indicated for use in liquid pig feed a veterinary surgeon can import an EU authorised veterinary medicine with such an indication. In this case a Special Import Certificate from the VMD will be required.

## CONSIDERATIONS

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8. When prescribing in-feed VMPs or water soluble VMPs in liquid pig feeds it is essential that the prescribing veterinarian considers the impact on the active substance and how this may affect the concentrations of the active substance that reach the blood or target tissues. If the concentrations are too low, the VMP may not have the required efficacy and the development of resistance to antimicrobials and anthelmintics will be encouraged. If the concentrations are too high, the VMP may produce adverse effects and give rise to higher than permitted concentrations of residues in meat.
9. The veterinary surgeon is required to issue a prescription when medicating feed with premixes classified as Prescription Only Medicines – Veterinarian (POM-V), which is the case for all premixes containing an antimicrobial.

The main points the veterinary surgeon needs to consider are:

<b>Homogeneity</b>	Will the active substance be evenly distributed throughout the liquid feed?
<b>Absorption</b>	Will the extent and rate of absorption of the active substance be affected by the feed?
<b>Dosage</b>	What is the correct dose in mg/kg bodyweight and should this be given as a single dose or should it be divided and given at set intervals across the day?
<b>Stability</b>	Will the active substance degrade in the liquid feed?
<b>Consumption</b>	What is the intake of liquid feed and what is the percentage of dry matter?
<b>Withdrawal period</b>	Will the withdrawal period specified on the label be sufficient?

The Marketing Authorisation Holder may be able to provide the veterinary surgeon with information which would help them consider these points.

When the cascade is followed, with regard to withdrawal periods the EU law only requires the application of a minimum standard withdrawal period where the target species is not one of the species listed on the SPC (2001/82/EC – article 11, paragraph 2). However, as indicated above, veterinary surgeons will need to consider when advising on a suitable withdrawal period whether the withdrawal period specified on the SPC for the species concerned is likely to be sufficient to avoid the presence of residues in food above the Maximum Residue Limit.

10. The answers to the above questions depend on the active substance and its formulation. **This is why wherever possible, the veterinary surgeon should prescribe and a farmer should use a VMP that has been specifically authorised for addition to liquid feed.** Where this is neither possible nor appropriate the veterinary surgeon and the farmer can adopt a number of measures to minimise the risk of incorrect dosing.

## **SUGGESTED MEASURES TO MINIMISE INCORRECT DOSING**

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### **IN-FEED VMPs**

11. The following are some of the measures that veterinary surgeons and farmers can take to minimise incorrect dosing when using an in-feed VMP in liquid pig feed:
- VMPs should be incorporated into premixtures, which include dry balancer meals<sup>2</sup> or complete dry feeds, by a suitably approved manufacturer;
  - ensure the final medicated liquid feed is thoroughly mixed;
  - take steps to help ensure that the pigs will consume the quantity of the final medicated liquid feed very quickly and, where possible, within an hour;
  - where a medicated dry balancer meal is being used, only mix the meal with the liquid feed at the farm immediately before feeding.

### **WATER SOLUBLE VMPs**

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12. When using a water-soluble VMP, the following measures can be taken to minimise incorrect dosing:
- after adding the product to some or all of the water needed to make the liquid feed, ensure the product is fully dissolved. This medicated water can then be mixed with the dry complete meal and, if appropriate, the remaining water. The system used should ensure that the medicated water is evenly distributed into the feed. Once prepared, the final medicated liquid feed should be fed to the pigs immediately with the aim of this being consumed very quickly and, where possible, within an hour.
  - the same recommendation applies when using water soluble VMPs in liquid co-products<sup>3</sup>, except that the medicated water is mixed with the liquid feed and, if appropriate, the remaining water.

## **ACTIONS THAT SHOULD BE AVOIDED**

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13. Whether in-feed VMPs or water soluble VMPs are used:
- farmers should not ferment medicated liquid feed;
  - farmers should not store medicated liquid feed;

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<sup>2</sup> Dry balancer is the dry ration.

<sup>3</sup> Co-products are by-products from the dairy, starch, brewing, bio-fuel and human food industries e.g. whey, yoghurt washings, wheat starch/yeast mixtures or liquid potato feed.

- veterinary surgeons should avoid prescribing in-feed VMPs or water soluble VMPs for addition to liquid feed, if it is contra-indicated or advised against on the label.

## **SUSPECTED ADVERSE REACTIONS**

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14. Irrespective of whether or not a product is used in accordance with its label, veterinary surgeons are encouraged to report any adverse reactions, including any cases of lack of efficacy, to the company or to the VMD. For more information about suspected adverse reactions please see VMG Note 11: *Pharmacovigilance – Guidance on Adverse Events*.

## **JOINT RESPONSIBILITY**

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15. The veterinary surgeon and farmer have joint responsibility for ensuring that:
  - the pigs will consume the quantity of medicated liquid feed very quickly and, where possible, within an hour;
  - the pigs receive the appropriate medication at the appropriate rate/frequency (e.g. for time-dependent antibiotics, the daily dose should be divided between an appropriate number of feeds over a 24 hour period);
  - any VMP, or premixture, is only incorporated into feed at a suitably approved premises;
  - VMPs are used responsibly and that all appropriate steps are taken to help avoid the development of resistance to antimicrobials and anthelmintics;
  - measures are taken to avoid cross contamination of one batch of liquid feed to the next.
16. The farmer is responsible for ensuring that the withdrawal period specified by the veterinary surgeon is met.

## **FURTHER INFORMATION**

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17. Further information is available from the Veterinary Medicines Directorate, Woodham Lane, New Haw, Addlestone, Surrey, KT15 3LS - Tel: (+44) (01932) 336911, or Fax: (+44) (01932) 336618. Veterinary Medicines Guidance Notes and other information, including details of VMD contacts, are available on the VMD website ([www.vmd.defra.gov.uk](http://www.vmd.defra.gov.uk)).
18. The register of approved manufacturers of medicated feedingstuffs can also be found on the VMD website.



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