

# Veterinary Drugs

Veterinary Bulletin - Agriculture, Fisheries and Conservation Department Newsletter

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## I. Introduction

Throughout this article the words drug and medicines will refer to veterinary drugs or veterinary medicines or veterinary vaccines. One ancient proverb reads, "Laughter is good medicine". Of course, laughter is not a medicine but the writer is giving two hints here. A cure may not only be due to the use of drugs and secondly we are all looking for 'good' medicines or 'good' drugs. In the sphere of veterinary drugs some questions we can ask ourselves are as follows: Why are 'good' veterinary drugs so relevant today? What types of veterinary drugs are there and how are they used? What are the marks of a 'good' veterinary drug and the 'good' use of a drug? What are the potential dangers to the general public with regard to veterinary drugs? What is the role of government with regard to veterinary drugs? How are all these matters relevant to the situation in Hong Kong?



A Selection of Veterinary Drugs

## II. Why are 'good' drugs so relevant today?

With the advent of modern chemistry and pharmacology it has been realized that drugs are very powerful agents for obtaining cures. Thus an enormous reliance has been placed on drugs to achieve a cure. Drugs, and sometimes surgery, are the main tools used



Recipients of Veterinary Drugs (Photos sourced from Agricultural Research Service of USDA)

to achieve cures. In livestock farming, sometimes thousands of animals are treated at one time in “batch drug treatments”. However, there is now, in the veterinary world, a slight ‘reformation’ going on with the realization that nutrition, management of stress, genetics, quarantine, isolation, housing and nursing can in fact be equally relevant in successfully treating such animals. Every species of animal can be treated with drugs. Fish, reptiles and even insects can be given drugs. Drugs, for which there is a big market, such as in the livestock and fish industries, are specially designed and manufactured by large multinational companies for that species and are tested and licensed before they are released for use. Some of these drugs are produced and used by the ton and this has raised concerns about the overuse of drugs. Drugs, for which there is a small market, such as in the treatment of snakes, are often those which were originally designed and licensed for another species, but were found, by experience, to be effective.

### III. *What types of veterinary drugs are there and how are they used?*

The drugs used by vets are at least as many if not more than those used by doctors. The list would include antibiotics used to kill certain bacteria; anthelmintics (驅腸蟲藥) used to kill internal parasites; insecticides used to kill fleas, lice, mites and ticks; hormones used to treat infertility and promote growth; drugs to treat specific conditions such as heart and respiratory disease, anaesthetics and others. The list is endless.

The route of administration is similarly variable. Drugs can be injected by the subcutaneous, intradermal, intramuscular or intravenous route or they can be inhaled (nebulized) or mixed in the water or in the food. Drugs mixed into drinking water or food is a common method of administration used in pig and poultry farms, often to reduce the stress of handling individuals.

The addition of antibiotics into animal feed is a controversial matter, particularly if they are used as a growth promoter or for the prevention of disease. However, an antibiotic used in feed for therapy to treat a large group of sick animals, provided they still have an appetite, is considered a good way to



Intradermal Drug Route



Food Medicated Drug Route

Intramuscular Drug Route

treat thousands of individuals. Tons of food can be so medicated, having the antibiotic inside it.

Drugs for external treatment can be poured, shampooed, sponged or rubbed on and in some cases the whole animal can be placed in a bath dip of drug in solution. This 'dipping' is a common method used for treating sheep and cattle for parasites.

#### IV. What is the 'good' use of a veterinary drug?

The 'good' use of a 'good' drug is such that it achieves a cure. But a 'good' drug must also have series of 'caveats': A caveat is a warning or proviso (附帶條件) of specific stipulations, conditions, or limitations about the use of the drug; one reason being that many drugs are poisonous if used incorrectly. Drugs wrongly used can, in some circumstances, be lethal. Examples of the caveats about drugs are as follows: the drug should have little or no side effects or deleterious effects on the animal being treated, no deleterious effects on the person managing the animal, none on the person who may consume the animal if the animal is one designed to be eaten and little or no deleterious effects on the environment as whole. Government as we shall see, has involvement in these matters. In simple terms, the government tries to make sure that all the 'caveats' about a drug are complied with.



Nebulized Drug Route



Poured on Skin Drug Route

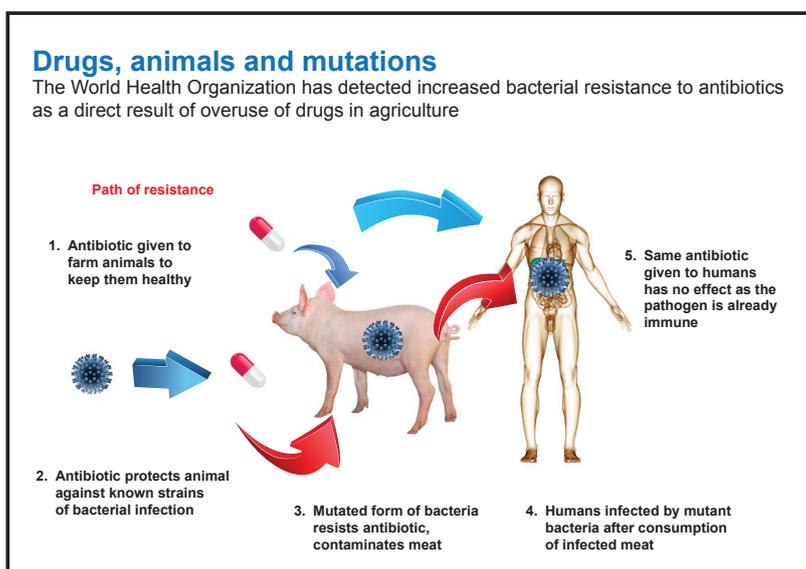


Water Medicated Drug Route

#### V. What are the potential dangers to the general public with regard to veterinary drugs?

As mentioned above, the overuse of antibiotics in livestock production may lead to antibiotic resistance developing in both animal and man. The potential spread of antibiotic resistance is of serious concern worldwide.

Recently, scientists have detected low levels of veterinary medicines in soils, surface waters, and ground waters worldwide. Although the environmental occurrence and associated impacts of

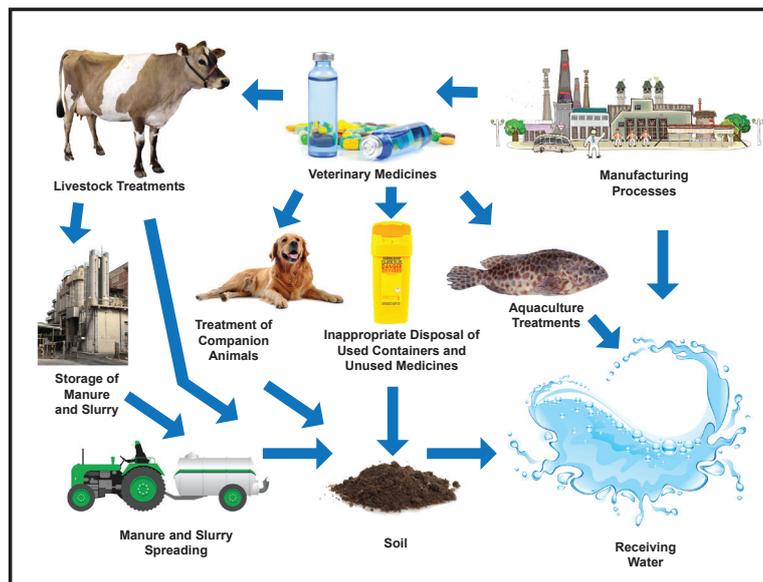


Antibiotic Resistance  
Sourced from World Health Organization

some compounds such as selected antibacterial compounds have been investigated, the impacts of many other substances found in the environment are not well understood. As a result, questions have arisen about the effects of veterinary medicines on organisms in the environment and on human health.

## VI. What is the role of government in these matters?

The answer is that just as there are 'good' drugs so there must be 'bad' drugs. That is drugs that are fakes, drugs that are ineffective, drugs that are dangerous. Although to some extent the pharmaceutical industry, through its own industry standards, can set certain controls, it is the opinion of nearly every government in the world that it is government's role to stop the sale and supply of 'bad' veterinary drugs. Furthermore, it is the role of government to stop the incorrect or 'bad' use of any drug no matter whether the drug itself is good or bad.



Veterinary Medicines in the Environment  
[http://toxics.usgs.gov/highlights/vet\\_meds.html](http://toxics.usgs.gov/highlights/vet_meds.html) (Ref. 1)

It is, after all, perfectly possible to take a good broncho-dilator drug like clenbuterol (鹽酸克倫特羅), designed to treat allergic respiratory disease in horses and to misuse it. Thus people have been known to manufacture clenbuterol and supply it to pig farmers. The pig farmers give it to the pigs as a 'lean meat' growth promoter. This is good business for the drug company and the farmer but in fact is placing members of the general public at risk because the residue of clenbuterol in the meat is dangerous to humans where it is known to cause muscle tremor, headache, dizziness and gastric irritation.



Prohibited Chemicals in Farm Animals

Even when administered correctly, veterinary medicine residues can thus remain in animal products such as meat (as in the case of clenbuterol above), fish, eggs, honey and milk after slaughter or collection, and so make their way into the food chain. Withdrawal periods are therefore imposed.

The withdrawal period is the waiting time that must elapse before treated animals can be slaughtered or their products, such as milk and eggs, are collected for human consumption. A safety-based legal

Maximum Residue Limit (MRL) For Tissues of Food Animals					
Item	Chemical	Chemical Metabolites	Food Animal species	Tissues	MRL
1.	Amoxycillin		All food animals	Muscle	50 µg/kg
				Liver	50 µg/kg
				Kidney	50 µg/kg
2.	Ampicillin		All food animals	Muscle	50 µg/kg
				Liver	50 µg/kg
				Kidney	50 µg/kg
3.	Benzylpenicillin		All food animals	Muscle	50 µg/kg
				Liver	50 µg/kg
				Kidney	50 µg/kg
4.	Chlortetracycline	Sum of the parent drug and its 4-epimers	All food animals	Muscle	100 µg/kg
				Liver	300 µg/kg
				Kidney	600 µg/kg
5.	Cloxacillin		All food animals	Muscle	300 µg/kg
				Liver	300 µg/kg
				Kidney	300 µg/kg

Maximum Residue Limit (MRL) For Tissues of Food Animals					
Item	Chemical	Chemical Metabolites	Food Animal species	Tissues	MRL
6.	Dicloxacillin		All food animals	Muscle	300 µg/kg
				Liver	300 µg/kg
				Kidney	300 µg/kg
7.	Doxycycline		Bovine	Muscle	100 µg/kg
				Liver	300 µg/kg
				Kidney	600 µg/kg
			Porcine	Muscle	100 µg/kg
				Liver	300 µg/kg
				Kidney	600 µg/kg
8.	Oxytetracycline	Sum of the parent drug and its 4-epimers	All food animals	Muscle	100 µg/kg
				Liver	300 µg/kg
				Kidney	600 µg/kg
9.	Sulfonamides	Sum of all substances belonging to the sulfonamide group	All food animals	Muscle	100 µg/kg
				Liver	100 µg/kg
				Kidney	100 µg/kg
10.	Tetracycline	Sum of the parent drug and its 4-epimers	All food animals	Muscle	100 µg/kg
				Liver	300 µg/kg
				Kidney	600 µg/kg

Maximum Residue Limits in Food Animal Tissues

limit called a maximum residue limit (最高殘餘限量) (MRL) is calculated for most registered veterinary drugs, and represents the maximum amount of the drug that is safely and legally permitted in the meat or other animal products for human consumption. The use of withdrawal periods ensures that residues do not exceed legal limits and provides assurance of public safety.

Government is thus required to produce legislation controlling such matters and has to employ and empower enforcement officers to make sure the law to prevent the misuse of drugs is applied. See X below.

## VII. What is the role of the general public in using veterinary drugs?

The role of the general public in these matters is to understand and act in accordance with the 'good' use of any drugs they have dealings with. This would also mean that their actions would comply with the laws of Hong Kong. Thus, if they have been given veterinary drugs to give to an animal they should give that drug to the correct animal. That is, the one animal or one group of animals that the veterinarian has told them to give it to. For example, if they have been given a drug that has been supplied to them for the use in poultry, they should not give it to pigs.



Chemical Residues Regulations for Farm Animals

They should only use drugs supplied to them by a legal supplier. They should not use drugs obtained from 'doubtful' or illegal sources. The reason for this is common sense: it is not simply a matter of law. Any drug supplied from a dubious(可疑的) source is an 'unknown' quantity. It could have anything in it! It might kill the animal or it might cure it. Even if the animal survives the experience of this 'unknown' drug, the

residues of the drug or any contaminants present in the drug may be left in the body tissues of the animal such as the muscle. This may well make it dangerous for humans at some later time to consume the meat of this animal.

The fact that the person has used the drug before, obtained by an illegal or dubious source, is no guarantee that the most recent batch of the drug supplied to them is safe. The reason is that there is no control or guarantee. The drugs legally and correctly supplied in Hong Kong do have a strong form of guarantee. This is because, as we shall see, checks have been made to ensure as far as possible when used correctly, the risk to the animal, to the environment and to the general public is minimal and acceptable. The aim, which is in line with government's aim, is to comply with the 'caveats' of the use of any drug.

One of the most important but often forgotten roles of the general public is to correctly store or dispose of any as yet unused, excess or out of date drug. Drugs unused and/or incorrectly stored, represent a possible danger to others and to the environment; while there is legislation to cover this aspect, it is the primary responsibility of every adult citizen at all times to store or dispose of drugs in a sensible and responsible manner. Many drugs can in fact be regarded as diluted poisons; if these potential poisons are found by say young children, or by pets, or disposed of in a river, tragedies can occur.

### *VIII. How are veterinary vaccines and veterinary drugs related?*

Vaccines are not drugs or medicines and although they do have some chemical preservatives inside their makeup, they are not chemicals, as we normally understand the term, but usually highly complex biological materials. Or to put it another way, they are made of chemicals but because they are "biological agents" the active chemical molecules are usually much larger and more complex than normal drugs. Nevertheless, because vaccines are often put into an animal in an unnatural way, for example, by injection and because, by their by nature, many vaccines are 'unnatural' and made by man, it has been thought that the safe option is to treat them in many respects like drugs. The root of the argument for doing this is 'safety first'. The laws and procedures involved with these vaccines reflect this approach.

### *IX. How does government, by legislation and enforcement action, ensure that only 'good' veterinary drugs are used and these drugs are used in a 'good' way?*

The government does play an active role in this matter. At first sight this action is not very obvious. The legislation looks good, but it is not obvious at first sight what is actually happening. Or to give an illustration, the legislation looks like a beautiful



Avian Influenza Vaccination

swan but it is hard to see the legs in the water underneath paddling away. It is hard to see the enforcement action used to ensure the law is complied with. It is not possible in this short article to describe all the actions taken. But if one looks at the whole process from importation (Hong Kong has no veterinary pharmaceutical manufacturing industry), to retail supply, to use of drugs, to disposal of drugs and protection of consumers from exposure to these drugs, one can see examples of this work. These are described in the following Boxes 1 and 2.

## **Box 1**

### ***How are Veterinary Drugs Prescribed in Hong Kong?***

In general, in Hong Kong, veterinary drugs may only be purchased on and in accordance with a prescription signed by a registered veterinary surgeon or, in the case of farmers, in accordance with an antibiotic permit issued by the Agriculture, Fisheries and Conservation Department.

In order to prevent the misuse of drugs, strict conditions apply to the giving of a prescription and to their dispensing, supply and labeling.

In so prescribing, the veterinarian will have examined the animal(s) recently and would be personally acquainted (通曉) with the keeping and care of the animal(s).

The prescription will be for animal treatment only and the drug shall not be dispensed more than once. It will be signed and dated by the prescribing veterinarian, specifying his or her address and the name and address of the person to whom the medicine is to be delivered. It will also indicate the name and total amount of the medicine to be supplied by the dispenser/pharmacist and the dose to be taken by or administered to the animal(s).

In addition the dispenser/pharmacist is under strict orders to label the medicine "for animal treatment only", to label the dose to be taken or administered and in certain situations to state the expiry date of the medicine.

Furthermore and for inspection purposes, specific records must be maintained by the prescribing veterinarian and by the person (usually a pharmacist) who dispenses the veterinary drugs.

### ***How are 'Extra' or 'Off-Label' Drugs used in Animals in Hong Kong?***

The approval and licensing of a veterinary drug is very costly. It requires a series of toxicological and pharmacological tests to prove that it does not harm. Pharmaceutical companies are reluctant to test drugs in species that are considered minor in terms of economic value as there is no return on their investment.

As a consequence, veterinarians are allowed to use and prescribe drugs in an 'extra' or 'off-label' manner, so as to alleviate the pain and suffering of an individual animal, or in cases of severe life-threatening disease, or where no approved/licensed drug is available to treat the condition or in the veterinarians professional opinion it is likely that the drug treatment will be safe and efficacious.

The usual requirement for a veterinary drug to be licensed for sale in Hong Kong is that the toxicological and pharmacological tests proving its safety have taken place and have been approved for use or sale in at least two other approved jurisdictions abroad.

## Box 2

### **Who is permitted to treat animals with veterinary drugs in Hong Kong?**

Only persons registered under the Veterinary Surgeons Registration Ordinance may medically treat animals.

However, under this ordinance, a certain few non-registered persons are exempted and they include: the owner (or his employee or a member of his household) when treating his own animal; a person who administers first aid to an animal for the purpose of saving its life or relieving pain and a person who is employed or retained by the Government for performing vaccinations on animals.

[http://www.legislation.gov.hk/blis\\_pdf.nsf/6799165D2FEE3FA94825755E0033E532/14EE1D5769F1C2A6482575EF00151935/\\$FILE/CAP\\_529\\_e\\_b5.pdf](http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/14EE1D5769F1C2A6482575EF00151935/$FILE/CAP_529_e_b5.pdf) (Ref. 2)

### **What is the Overriding Veterinary Drug Legislation in Hong Kong?**

In the main, the responsible and enforcing government agency in Hong Kong is the Department of Health. It legislates to control veterinary drugs and vaccines through the Pharmacy and Poisons Ordinance and Regulations (Cap 138) and the Antibiotics Ordinance and Regulations (Cap 137). This legislation can be found on the Internet at the following links:

- Pharmacy and Poisons Ordinance and Regulations (Cap 138):

[http://www.legislation.gov.hk/blis\\_pdf.nsf/6799165D2FEE3FA94825755E0033E532/0F66D4839C78DBDA482575EE00438DD5?OpenDocument&bt=0](http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/0F66D4839C78DBDA482575EE00438DD5?OpenDocument&bt=0) (Ref. 3)

[http://www.legislation.gov.hk/blis\\_pdf.nsf/6799165D2FEE3FA94825755E0033E532/98C7D17989BE0FD1482575EE0043A3C8/\\$FILE/CAP\\_138A\\_e\\_b5.pdf](http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/98C7D17989BE0FD1482575EE0043A3C8/$FILE/CAP_138A_e_b5.pdf) (Ref. 4)

- Antibiotics Ordinance and Regulations (Cap 137):

[http://www.legislation.gov.hk/blis\\_pdf.nsf/6799165D2FEE3FA94825755E0033E532/8CA8AB37ACC51404482575EE00437AB8?OpenDocument&bt=0](http://www.legislation.gov.hk/blis_pdf.nsf/6799165D2FEE3FA94825755E0033E532/8CA8AB37ACC51404482575EE00437AB8?OpenDocument&bt=0) (Ref. 5)

[http://www.legislation.gov.hk/blis\\_ind.nsf/CURALLENGDOC/555E70C5903AF8B288256489000ADE35?OpenDocument](http://www.legislation.gov.hk/blis_ind.nsf/CURALLENGDOC/555E70C5903AF8B288256489000ADE35?OpenDocument) (Ref. 6)

The Department of Health also maintains a comprehensive, informative and useful web page outlining and explaining its guidelines, forms, lists (of pharmaceutical products, dangerous drugs, poisons, authorized sellers, registered wholesalers, retailers, importers, exporters and manufacturers), codes of practice and other information. This can be found at: <http://www.psdh.gov.hk/eps/root/en/level.html> (Ref. 7)

### **How are Veterinary Drugs Imported into Hong Kong?**

“Pharmaceutical products”, which includes veterinary drugs, must be registered before they can be imported, or manufactured locally, for supply in Hong Kong.

- Guidance notes on the registration of pharmaceutical products/substances, including

veterinary drugs, can be found on the Department of Health's Pharmaceutical Services web page at: <http://www.psdh.gov.hk/eps/eng/html/guid.pdf> (Ref. 8)

### **Where can Veterinary Drugs be Bought in Hong Kong?**

- The Drug Office of the Department of Health provides a search engine on the Internet where consumers can search for registered drugs and retail suppliers of such in Hong Kong. This can be found at: [http://www.drugoffice.gov.hk/eps/root/en/consumer/search\\_drug\\_database.html](http://www.drugoffice.gov.hk/eps/root/en/consumer/search_drug_database.html) (Ref. 9)

## **Box 3**

### **How are Veterinary Drugs Regulated in Other Countries?**

Useful guidelines on the regulation of veterinary drugs in other countries can be found at:

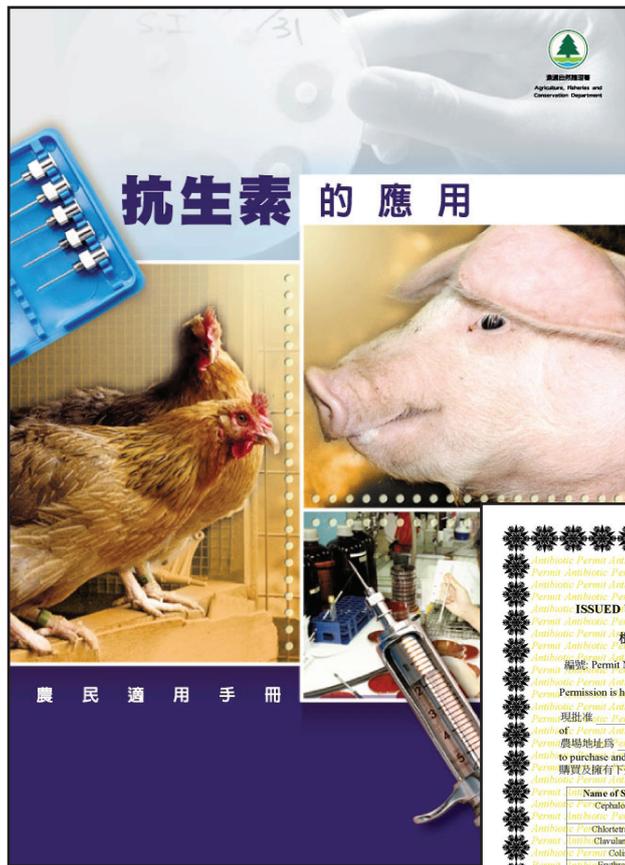
- Food and Agriculture Organization of the United Nations (FAO):  
<http://www.fao.org/DOCREP/004/AC343E/AC343E00.HTM> (Ref. 10)  
<http://www.fao.org/legal/prs-ol/lpo38.pdf> (Ref. 11)
- European Union:  
[http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/landing/veterinary\\_medicines\\_regulatory.jsp&mid=WC0b01ac058001ff8a](http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/landing/veterinary_medicines_regulatory.jsp&mid=WC0b01ac058001ff8a) (Ref. 12)
- Australia:  
[http://www.ava.com.au/sites/default/files/documents/Other/Guidelines\\_for\\_prescribing\\_authorising\\_and\\_dispensing\\_veterinary\\_medicines.pdf](http://www.ava.com.au/sites/default/files/documents/Other/Guidelines_for_prescribing_authorising_and_dispensing_veterinary_medicines.pdf) (Ref. 13)
- UK:  
<http://www.bsava.com/LinkClick.aspx?fileticket=Pik2rSpsRWA%3D&tabid=372> (Ref. 14)
- USA:  
[http://www.avma.org/issues/policy/prescription\\_drugs.asp](http://www.avma.org/issues/policy/prescription_drugs.asp) (Ref 15)
- Canada:  
[http://www.hc-sc.gc.ca/dhp-mps/vet/faq/faq\\_dap-pam-eng.php#a5](http://www.hc-sc.gc.ca/dhp-mps/vet/faq/faq_dap-pam-eng.php#a5) (Ref. 16)  
<http://antimicrobialcanada.com/pdfs/monday-Oct-31/Manisha-Mehrota-Animal-Drug-Regulation.pdf> (Ref. 17)

# X. The correct use of veterinary drugs, particularly on farms:

From time to time the Agriculture, Fisheries and Conservation Department provide farmers with information on the correct use of antibiotics, other drugs and vaccines in farm animals. The handbook pictured below is an example.

The handbook provides background information on the proper use of antibiotics and discusses important public health issues such as drug residues and antibiotic resistance. In addition it provides information on the various types of antibiotics, guidelines on disease prevention and also some guidelines on selecting antibiotics for treating specific diseases. Useful reference tables on drug withholding periods, MRLs and vaccination schedules are also given.

The use of antibiotics on farm animals in Hong Kong is controlled. Farmers are allowed to buy only specified antibiotics and the permit below is a photocopy of such.



AFCD Farmers Handbook

香港特別行政區政府  
漁農自然護理署  
九龍長沙灣道303號  
長沙灣政府合署五樓

THE GOVERNMENT OF THE HONG KONG  
SPECIAL ADMINISTRATIVE REGION  
AGRICULTURE, FISHERIES AND  
CONSERVATION DEPARTMENT  
Cheung Sha Wan Government  
Offices  
303 Cheung Sha Wan Road  
5<sup>th</sup> Floor, Kowloon, Hong Kong

檔案編號 File Reference: \_\_\_\_\_

暫停供應食用動物的命令  
ORDER TO SUSPEND THE SUPPLY OF FOOD ANIMALS

《公眾衛生(動物及禽鳥)(化學物殘餘)規例》(第139章·附屬法例N)第9條  
Section 9 of the Public Health (Animals and Birds) (Chemical Residues) Regulation (Cap. 139 sub. leg. N)

致: XXX  
To: \_\_\_\_\_  
(適用於所有人士或食肉動物的牌照)  
(Food animal farmer or food animal trader)

漁農自然護理署署長現根據《公眾衛生(動物及禽鳥)(化學物殘餘)規例》(第139章·附屬法例N)第9條·命令  
你由2012年X月X日[至2012年XX月XX日(包括首尾兩日)]暫停供應所有來自下列各掌管  
的農場食用動物:  
牌照號碼/牌照類別: LK XXX  
農場地址為: 新界 元朗 錦田 大江埔村 第XXX 約 XXX 地段。

Pursuant to section 9 of the Public Health (Animals and Birds) (Chemical Residues) Regulation (Cap. 139 sub. leg. N), the  
Director of Agriculture, Fisheries and Conservation hereby orders you to suspend the supply of all food animals from the  
following farm under your charge from XX 2012 [to XX XX 2012 (both dates inclusive)]:  
Licence No./Licence Class: LK XXX  
XX in DD XXX, Tai Kong Po Tuen, Kam Tin, Yuen Long.

是基於下列理由:  
場所供應的屠殺, 其組織內的農藥及獸醫用化學物(即強力毒藥)的濃度被懷疑超過規  
場所供應的屠殺被懷疑含有違禁化學物(即氫氯素))

has been made because:  
an agricultural and veterinary chemical, namely Doxycycline, in the tissue of a pig supplied by the above  
farm is suspected of exceeding the maximum residue limit  
the above farm under your charge is suspected of containing a prohibited chemical, namely Chloramphenicol.

漁農自然護理署署長 2012年XX月XX日  
( ) 日期  
Director of Agriculture, Fisheries and Conservation Date

ANTIBIOTIC PERMIT  
抗生藥許可證

ISSUED UNDER SECTION 6(2) OF ANTI-BIOTICS ORDINANCE  
(CAP.137) 抗生藥條例第六(二)條簽發

根據香港法例第137章抗生藥條例第六(二)條簽發

牌照號碼/牌照類別: LK XXX  
農場地址為: 新界 元朗 錦田 大江埔村 第XXX 約 XXX 地段。

Permission is hereby granted to \_\_\_\_\_  
to purchase and possess for the purpose of veterinary treatment the following antibiotics:  
購買及擁有下列抗生藥用以治療動物疾病(以英文名稱為準):

Name of Substance (物質名稱)	Drug Name (藥物名稱)
Cephalosporins (頭孢菌素類)	Cefalexin (頭孢菌素)
Chloramphenicol (氯黴素)	Chloramphenicol (氯黴素)
Clavulanic acid (克拉維酸)	Clavulanic acid (克拉維酸)
Colistin (多粘菌素)	Colistin (多粘菌素)
Erythromycin (紅黴素)	Erythromycin (紅黴素)
Germanium (日曬大藥)	Germanium (日曬大藥)
Josamycin (5S) (5S紅黴素)	Josamycin (5S) (5S紅黴素)
Kanamycin (卡那黴素)	Kanamycin (卡那黴素)
Lincomycin (林可黴素)	Lincomycin (林可黴素)
Neomycin (新黴素)	Neomycin (新黴素)
Novobiocin (新生素)	Novobiocin (新生素)
Oxytetracycline (氧化紅黴素)	Oxytetracycline (氧化紅黴素)
Penicillin (青黴素)	Amoxicillin (阿莫西林)
Penicillin (青黴素)	Ampicillin (安匹西林)
Penicillin (青黴素)	Benzylpenicillin (苯甲基青黴素)
Penicillin (青黴素)	Procaine Penicillin (普魯卡因青黴素)
Fleptomycin (佛羅普黴素)	Fleptomycin (佛羅普黴素)
Rifamycin (利福黴素)	Rifamycin (利福黴素)
Spectinomycin (大觀黴素)	Spectinomycin (大觀黴素)
Spiramycin (螺旋黴素)	Spiramycin (螺旋黴素)
Spectinomycin (大觀黴素)	Spectinomycin (大觀黴素)
Tetracycline (四環黴素)	Tetracycline (四環黴素)
Doxycycline (多西環素)	Doxycycline (多西環素)

for Director of Agriculture, Fisheries and Conservation  
漁農自然護理署署長

AF 332 (04/2011)

Farmers Antibiotic Permit

Order to Suspend Supply of Pigs as a Result of a Chemical Residue Finding

## XI. How is the consumer protected from exposure to veterinary drugs that may be present in food of animal origin?

Inspection procedures nowadays include laboratory checks to look for substances such as growth promoters, hormones, antibiotics or chemicals used in the production of the meat, milk, eggs and other foodstuffs of animal origin with the aim of significantly reducing the risk of the public consuming harmful chemicals.

The picture below shows veterinary public health staff collecting the urine of a pig that may contain traces of an illegal substance, clenbuterol.



Clenbuterol Residue Checking in a Hong Kong Slaughterhouse

## XII. Recent veterinary drug issues in Hong Kong that may be considered.

The world is a constantly changing place and consideration could be given to reviewing the legislation, much of which has not been altered in many years. This is because, for example, the registration of a veterinary drug is not easily accomplished in Hong Kong and most drug companies do not bother to register veterinary drugs here, as it is not worth their while to do so because:

- The Hong Kong market for veterinary drugs is very small;
- The human dose standard is used for the specific drug/chemical's registration, if the chemical/drug is already registered for human use; and if the veterinary dose standard is essential (and the drug is already registered for human use) the drug/chemical has to be declared a new molecule which then involves an enormous amount of additional paper-work proving its safety and efficacy.
- Once the veterinary drug is registered, similar or the same non registered veterinary drug (often of a poorer or dubious quality, or of a poorer/dubious quality control standard, or a cheaper produced one) may be legally imported from overseas and prescribed here.



Registered Avian Influenza Vaccine



Carcass Residue Checking Prior to Sale

In order to improve the system of registering veterinary drugs in Hong Kong, it has been suggested, by some, that a system be adopted whereby a veterinary drug that is tested and registered in say the UK/EU/Australia/New Zealand/USA is then permitted to be registered in Hong Kong without further ado. Furthermore, once it is so registered the same/similar such veterinary drugs should not be allowed to be imported from other sources.

Another issue of concern with the current veterinary use of antibiotics worldwide is that veterinarians are legally permitted and quite often do use human antibiotics of last resort on the animals (pets) that they are treating. This

potentially renders such antibiotics useless if antibiotic resistance develops in these animals (pets) and this resistance is then transferred to the pet owners and the human population at large.

### *XIII. Conclusion*

Even before man was treating animals with medicines, animals were in fact treating themselves. (Ref. 18 and 19). There is nothing fundamentally new about animals receiving medication. As soon as man started to domesticate animals thousands of years ago he also began to treat them.

The major change has however arisen in the last two hundred years, whereby the industrial revolution, the development of modern chemistry and biological sciences has caused quantitative and qualitative changes in the treatment of animals with medicines. The main changes have been increases in the complexity and range of medicines, the 'power' of these medicines, the total quantities that can be administered at one time and the effects these medicines can have not only on the animals themselves, but in the product the animals produce whether meat or milk. Finally, the effect on the environment of some of these veterinary drugs is not fully known. This is also true for some human drugs: for instance there is still a lively debate about the effect of human contraceptive pills excreted in urine and ending up in water catchments and rendering fish and other marine life infertile.

In broad terms man is playing 'catch up' with his own success. Thousands of different drugs have been produced. The majority are very safe and effective and have been well tested. But equally well, we know that even with all the best trials and testing, the use of drugs may have unexpected

consequences. On the rare occasions this occurs, it is often dramatically highlighted by the media who ignore the massive successful application of veterinary medicines with its great benefit for animal welfare. Today some animals receive therapy as good as humans and thousands of animals lives have been saved by the correct or 'good' use of these veterinary medicines.

Given this vast range of potential issues, government has to focus on areas where the misuse or 'bad' use of drugs is known to have serious and immediate effects. Hence there is a testing regime for pig meat. There is inspection and regulation of farmers and farms. There is control on who can obtain these veterinary drugs, restricting the source, in the first instance, to registered veterinarians. There is control of the importation of veterinary drugs. This is not to be complacent. The challenge is to correctly target and adapt the government regulation process to make the best use of resources to address modern problems. Thus there is reason to reassess the process of importation of veterinary drugs and to consider purely on practical safety grounds to link it directly to another jurisdiction. This would be a jurisdiction which governs a much larger drug turnover than Hong Kong.

The modern veterinary armament (裝備) was even ten years ago sufficient to counter nearly all farm diseases. This is because the farm veterinarians also have the option of hygiene control such as quarantine, isolation, and all-in all-out policies on farms. In this context certain very modern drugs should probably not be used in farms and legislation to that effect should probably be brought in. Although small animal veterinarians do not have the hygiene controls available to farm veterinarians they still have a powerful 'drug cabinet' to choose from.

In one sense, to use the English phrase, "the genie has been let out of the bottle". In the last two hundred years, modern veterinary medicines have arrived. They are literally 'let out of the bottle' in many cases. Like the genie they are very powerful and able to do great good. But also like genies, they can run "amok" and once out of control can cause harm. The challenge is how to regulate and control such a rapidly changing, powerful vast range of veterinary drugs. It is obvious there is no perfect solution to the governance of the use of veterinary drugs. If there was it would be out of date within a year. The continual challenge is thus to correctly target and effect changes related to the main issues of the day.

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