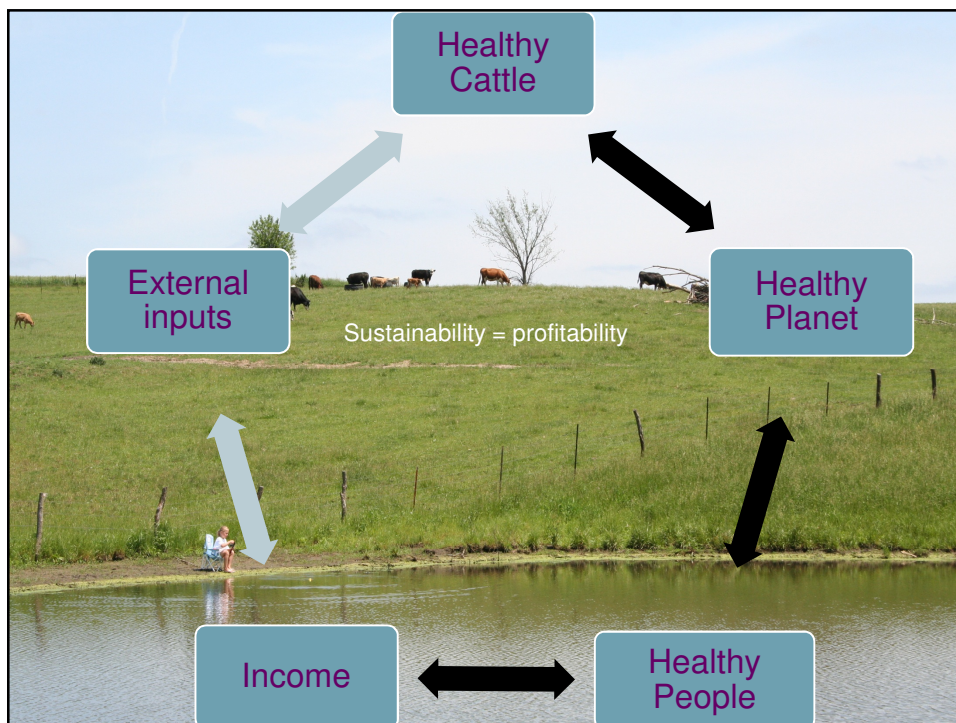


ANTIBIOTICS AND KANSAS BEEF PRODUCTION



Daniel U. Thomson PhD, DVM
Jones Professor of Production Medicine



Questions about antibiotics



It was on a short-cut through the hospital kitchens that Albert was first approached by a member of the Antibiotic Resistance.

Antibiotics:
Will they work when you really need them?



It's NOT about...	It IS about...
Facts	Their fear
Science as an explanation	Addressing personal concerns
"Doing what's proven to be safe and effective"	"Doing what's right"

Keep our antibiotics working: Preventative medicine and Animal Husbandry

- Respiratory disease
- Liver abscesses
- Foot rot
- Pink eye
- Calf scours
- Mastitis



“As much as cattle are worth, I’m going to do all I can to help them live”

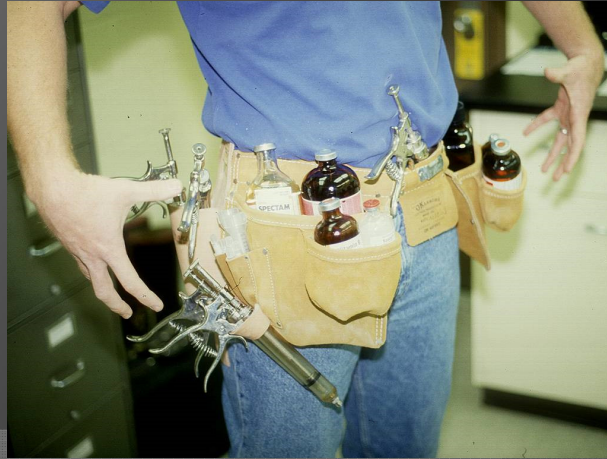


We know what is right, don't we?

- To change the outcome, we must -
 - Change the process
 - Distort the process
 - Distort the data

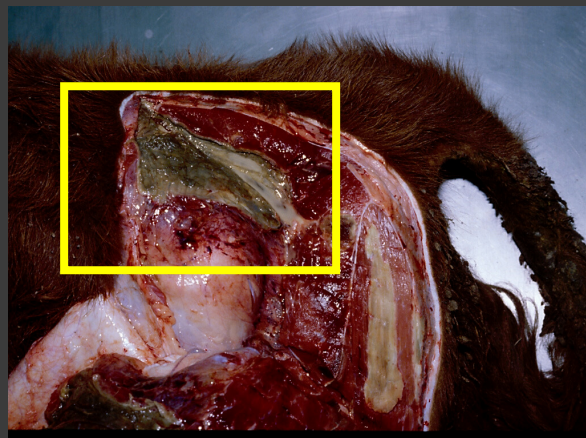


ANTIBIOTIC RESIDUE AVOIDANCE AND JUDICIOUS ANTIBIOTIC USAGE



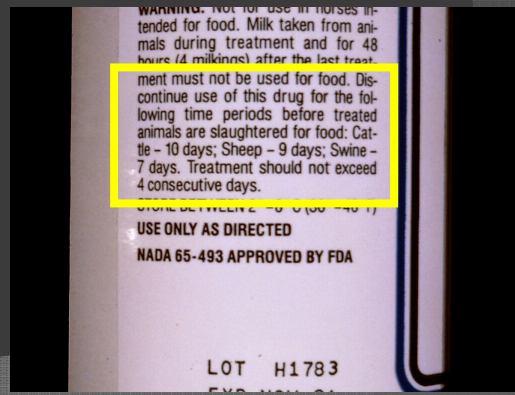
Injection Site Lesions

- Don't inject into top butt



Drug Residue Avoidance

- Observe withdrawal times
 - Injectable products
 - Oral products
 - Feed additives



What is a VCPR (state defined)?

- A VCPR indicates the veterinarian
 - engages with the client to assume responsibility for making clinical judgments about patient health
 - has sufficient knowledge of the patient by virtue of patient examination and/or visits to the facility where the patient is managed
 - Can provide any follow up care
- AND
 - The producer agrees to comply with prescription

What is extra-label (ELDU)?

- The use of an antimicrobial:
 - in a species that it isn't on the label
 - at a dosage above or below the label directions
 - use of a human drug on a food producing animal



Animal Medicinal Drug Use Clarification Act
Signed into law 10/22/94

Veterinary records and bottle label requirements

- Identify the animals
- Animal species treated
- Number of animals treated
- Name of drug and active ingredient
- Dosage prescribed
- Duration of treatment
- Extended withdrawal
- FDA may have access to records
- Name and address of the prescribing veterinarian
- Established name of each drug
- Specified directions including identification of animal or herd or pen, dosage frequency, route of administration and duration of therapy
- Cautionary statements
- **Withdrawal – US FARAD**



Animal Medicinal Drug Use Clarification Act Signed into law 10/22/94

No extra-label
usage of any
non-nutritive
feed
additives!! No
excuses, no
authority.



Two VFD guidance documents

- ◉ Guidance #209
 - the use of medically important antibiotics in food-producing animals should be limited to uses necessary for assuring animal health
 - use of medically important antibiotics in food-producing animals should be limited to those uses that include veterinary oversight or consultation.
- ◉ Guidance #213
 - drug companies to voluntarily revise their product labels to remove growth promotion and feed efficiency claims
 - provide for moving over-the-counter products to prescription or [veterinary feeddirective](#) (VFD) status (by December 2016)

<http://feedstuffs.com/vfd.aspx>

What are VFD Drugs?

- ◉ VFD drugs:

- Antimicrobials that FDA approved for use in animal feeds
- Antimicrobials used under veterinarian supervision and issued under written veterinary feed directive orders

<http://feedstuffs.com/vfd.aspx>

What will change with VFD?

- Growth promotion uses of antibiotics in feed will no longer be allowed (examples: CTC, [Aureomycin](#), virginiamycin),
- The use of “medically important” feed antibiotics will need a VFD and can only be used for treatment, control, or prevention

<http://feedstuffs.com/vfd.aspx>

What won't change

- Use of non-medical feed additives
- Ionophores
- Coccidiostats
- Drugs not allowed for animal use

<http://feedstuffs.com/vfd.aspx>



Unaffected by FDA proposals		Affected by FDA proposals	
Animal use only	Drugs used exclusively in animals:	Shared use	
<ul style="list-style-type: none"> - Ionophores - Polypeptides - Carbadox - Bambermycin - Pleuromutilin 	<ul style="list-style-type: none"> - Penicillins - Cephalosporins - Quinolones - Fluoroquinolones - Tetracyclines 	Drugs deemed "important for human medicine" and used by both animals and humans, such as: <ul style="list-style-type: none"> - Macrolides - Sulfas - Glycopeptides - Others 	
Human use only	Drugs used exclusively in humans:	Therapeutic uses (still allowed under veterinary supervision) <ul style="list-style-type: none"> Treat animals diagnosed with an illness Control the spread of illness in a herd Prevent illness in healthy animals when exposure is likely 	
<ul style="list-style-type: none"> - Daptomycin - Glycylcyclines - Mupirocin - Mycobacterium anti-infectives 		Production uses (No longer allowed) <ul style="list-style-type: none"> Enhance growth or improve feed efficiency 	

Veterinary Feed Directive

- Must have a VCPR as defined by the state
- Each VFD will have a specific VFD form or DVM will have their own clinic VFD form
- 3 copies – Veterinarian, Producer and Feed store
- All parties must maintain copies of the VFD for two years
- Faxes and electronic VFD (including smart phone)
 - No verbal VFDs

Information required on VFD

1. The veterinarian's name, address, and telephone number;
2. The client's name, business or home address, and telephone number;
3. The premises at which the animals specified in the VFD are located;
4. The date of VFD issuance;
5. The expiration date of the VFD;
6. The name of the VFD drug(s);
7. The species and production class of animals to be fed the VFD feed;
8. The approximate number of animals to be fed the VFD feed by the expiration date of the VFD;
9. The indication for which the VFD is issued;
10. The concentration of VFD drug in the feed and duration of use;
11. The withdrawal time, special instructions, and cautionary statements necessary for use of the drug in conformance with the approval;
12. The number of reorders (refills) authorized, if permitted by the drug approval, conditional approval, or index listing;
13. The statement "Use of feed containing this Veterinary Feed Directive (VFD) drug in a manner other than as directed on the labeling (extra-label use), is not permitted;"
14. An affirmation of intent for combination VFD drugs as described in 21 CFR 558.6(b)(6); and
15. The veterinarian's electronic or written signature.

Pulmoil® (tilmicosin) Veterinary Feed Directive for use in Cattle

Client: _____ Veterinarian: _____
 Address: _____ Address: _____

Phone #: _____ Phone #: _____
 Fax #: _____ Fax #: _____

Cattle to be treated (number and location): _____ Special Instructions: _____

Mix into Type C Medicated Feed to Provide: _____ VFD Expiration Date: _____
 Total lbs Type C Complete Feed at _____ g/ton Monthly/Day/Year (not to exceed 45 lbs)
 Type C complete feed range of 160 to 157 g/ton Amount of final (Type C) feed: _____
 Total lbs Type C Complete Feed at _____ g/ton
 Type C complete feed range of 160 to 157 g/ton Veterinarian's signature: _____
 Date: _____ License # and State: _____

CAUTION: Federal law limits this drug to use under the professional supervision of a licensed veterinarian. Animal feed containing or containing this veterinary feed directive drug shall be fed to animals only if or upon a valid veterinary feed directive issued by a licensed veterinarian in the course of the veterinarian's professional practice. Cattle label use, for use of the VFD feed is a manner other than as provided for in the VFD drug approval, is strictly prohibited.

Active Drug Ingredient: tilmicosin (as tilmicosin phosphate) 0.7 g per lb (200 g per kg) feed equivalent ground corn cob.

Description: Tilmicosin is formulated as the antibiotic tilmicosin. Tilmicosin is produced semi-synthetically and is in the macrolide class of antibiotics. Each kilogram of Type A Medicated Article contains 200 grams (0.44 lbs) of tilmicosin advertised onto ground corn cob.

Indications: Cattle: For the control of bovine respiratory disease (BRD) associated with Mannheimia haemolytica, Pasteurella multocida, and Histophilus somni in groups of beef and non-lactating dairy cattle, where active BRD has been diagnosed in at least 10% of the animals in the group.

Feeding Instructions: Cattle (Complete Feeds): This tilmicosin feed is to be fed continuously for a single, 14-day period at 568 grams to 757 grams (208 ppm to 284 ppm) per ton of Type C medicated feed as the Complete Type C medicated feed (not to be pelleted).

IMPORTANT: Must be thoroughly mixed in feeds before use.

Feeding Instructions: For Pelleted Feeds: Cattle Feeds Complete Feeds: Thoroughly mix Pulmoil Type A medicated article with feed to provide a complete Type C medicated feed containing 568 to 757 grams tilmicosin per ton. Complete Type C medicated feeds should not be pelleted.

Starting concentration of Pulmoil Type A Medicated Article	Amount of Type A Medicated Article to add per ton	Resulting concentration in Type C Medicated Feed
grams per pound	pounds	grams per ton
0.7	8.58	757
	8.28	568

CAUTION: Do not allow horses or other equines access to feeds containing tilmicosin. The safety of tilmicosin has not been established in cattle intended for breeding purposes. Use of antibiotic drugs in the presence of a susceptible bacteria (infect) is unlikely to provide benefit to treated animals and may increase the risk of development of drug-resistant pathogenic bacteria. To assure both food safety and responsible use in cattle, the treatment of cattle with the medicated feed is required to be initiated within the first 45 days of the production period. Treatment should not occur concurrent with treatment administration of an antibiotic, or within 1 day following administration of a non-macrolide antibiotic (B2 Therapy). Tilmicosin medicated feed treatment has not been evaluated in cattle with severe clinical disease. Cattle with severe clinical illness should be treated for individual treatment with an alternative non-macrolide therapy.

Complete Type C medicated feeds containing tilmicosin should not be pelleted. Do not use in any feeds containing barbiturates, cottonseed meal, or cottonseed hulls. Barbiturates, cottonseed meal, or cottonseed hulls in feeds may affect the efficacy of tilmicosin.

The expiration date for a tilmicosin Veterinary Feed Directive (VFD) for cattle must not exceed 45 days from the time of issuance. VFDs for tilmicosin phosphate shall not be refilled.

RESIDUE WARNING: Cattle: Cattle intended for human consumption must not be slaughtered within 28 days of the last treatment with this drug product. This drug product is not approved for use in female dairy cattle 30 months of age or older. Use in these cattle may cause drug residues in milk. This drug product is not approved for use in calves intended to be processed for veal. A withdrawal period has not been established for pre-ruminating calves.

User Safety Warnings: Avoid inhalation, contact with eyes, and direct contact with hot surfaces. Operators mixing and handling this VFD should wear protective clothing, respiratory gear, goggles, and a NIOSH-approved dust mask. Wash thoroughly with soap and water after handling. If accidental eye contact occurs, immediately rinse thoroughly with water. If irritation persists, seek medical attention. Use for multiple generations. Feed out of reach of children. The Material Safety Data Sheet contains more detailed occupational safety information. To report adverse effects in users, to obtain more information, or to obtain a Material Safety Data Sheet, call 1-800-428-4141.

For technical service call 1-800-428-4141.
 Store at less than or equal to 25°C (77°F). Excursions to 40°C (104°F) are acceptable. Avoid excessive moisture. Elanco Animal Health, A Division of Eli Lilly and Company
 IND-000001-11-144, APPROVED BY THE FDA
 Pulmoil® is a registered trademark of Eli Lilly and Company
 White Copy - Supplier Colored Copy - Client Pink Copy - Veterinarian

Printed example graph for 40 number feed tanks and grass hay bins

Animal ID	Animal Name	Animal Location	Animal Weight	Animal Sex	Animal Age	Animal Breed	Animal Color	Animal Status	Animal Date	Animal Notes
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40

Printed example graph for 40 number feed tanks and grass hay bins

Printed example graph for 40 number feed tanks and grass hay bins

Other VFD requirements?

- Veterinarian must set an expiration date
 - Maximum 6 months
- Need to estimate number of animals that will be fed a VFD drug during the 6 months

Future direction of VFD?

- The FDA believes long-term or open-ended use of medically important antibiotics is a significant stewardship issue and intends to seek broad public input on this issue in the summer of 2015.

frontiers in MICROBIOLOGY



Effect of subtherapeutic vs. therapeutic administration of macrolides on antimicrobial resistance in *Mannheimia haemolytica* and enterococci isolated from beef cattle

Rahat Zaheer¹, Shaun R. Cook¹, Cassidy L. Klima¹, Kim Stanford², Trevor Alexander¹, Edward Topp³, Ron R. Read⁴ and Tim A. McAllister^{1*}

Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada 2
Alberta Agriculture and Rural Development, Lethbridge, AB, Canada 3
Southern Crop Protection and Food Research Centre, Agriculture and Agri-

frontiers in MICROBIOLOGY



We have a strong story of continuous improvement

- Beef Quality Assurance
- AMDUCA – EDLU
- US FARAD
- Ban on aminoglycosides
- Veterinary Feed Directive
- OTC antibiotics next??
- Traceability??



We have to educate our industry

"If you lose money for the firm, I will be very understanding. If you lose reputation for the firm, I will be ruthless."

— Warren Buffett

