


# General Biosecurity, Antimicrobial Use, and Regulations

**Richard Pereira, DVM, PhD**  
Assist. Prof. of Clinical Livestock Herd Health  
UC Davis, Veterinary Medicine



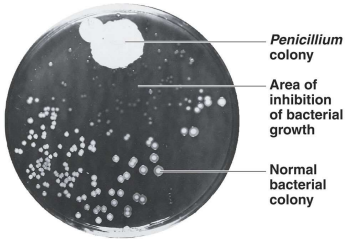
1

## Index


- 1. Antimicrobials**
  - a. Importance
  - b. Selection of Resistance
  - c. Factors affecting AMU in Livestock
- 2. AMU Legislation**
  - a. Veterinary Feed Directive (VFD) - brief
  - b. Senate Bill 27 (SB27)
- 3. Biosecurity**

2

### Discovery of Antimicrobial Drugs



Penicillium colony  
Area of inhibition of bacterial growth  
Normal bacterial colony

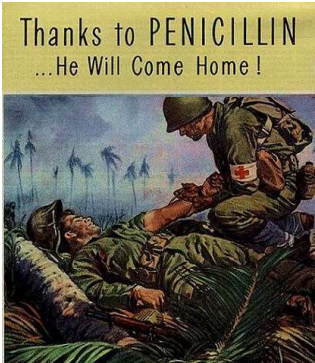


1928                      1938


Source: awesomestories.com/asset/view/Penicillin-The-Wonder-Drug-0/

3

### Importance of Antimicrobial Drugs



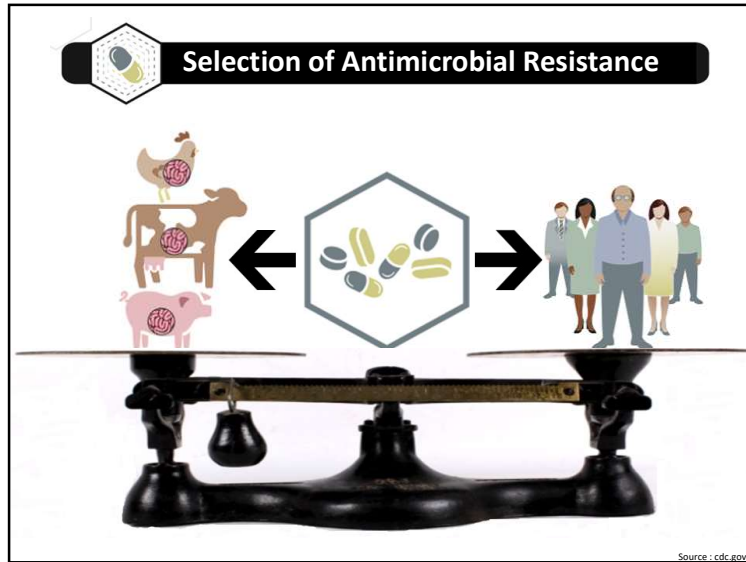
1941



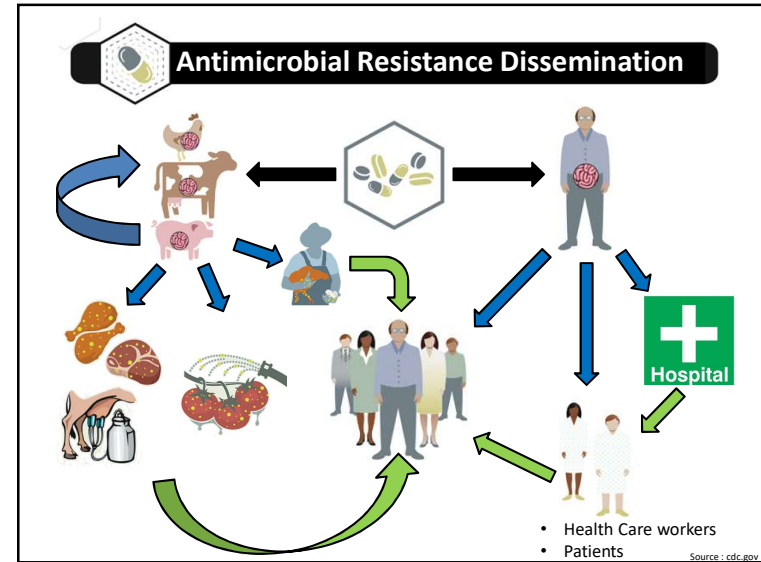
1945

Source: nww2m.com/tag/penicillin/

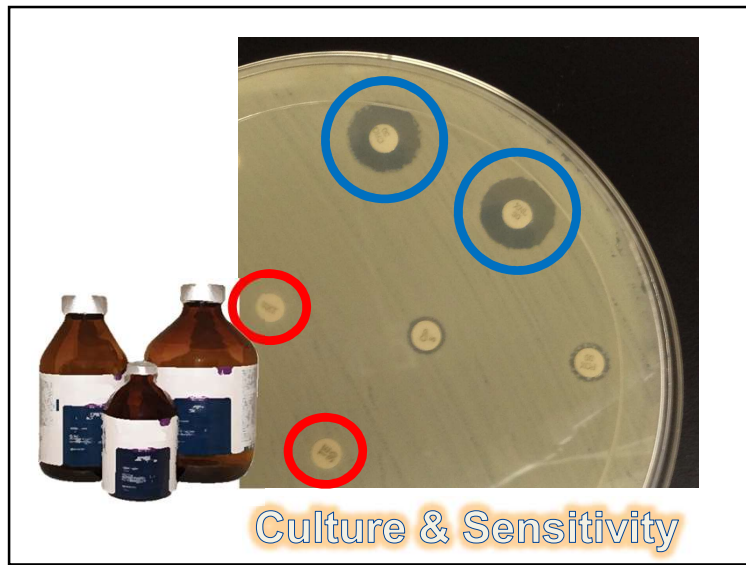
4



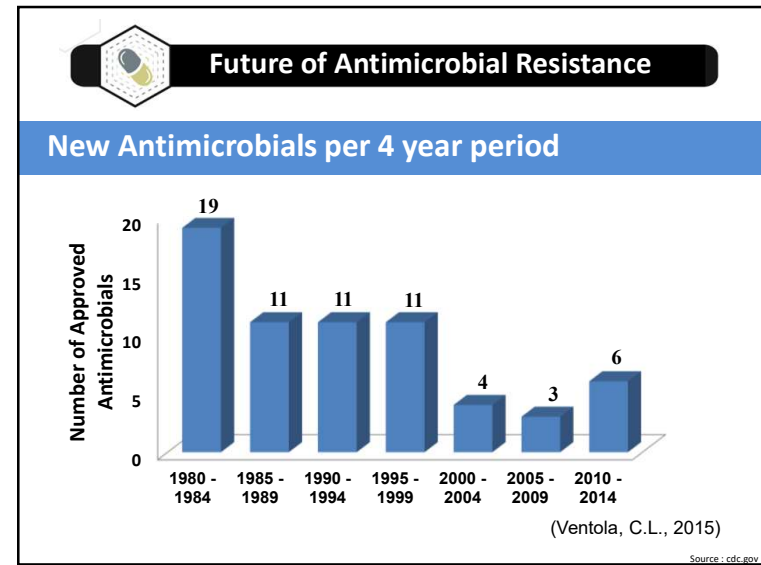
5



6



7



8

## Antimicrobial Resistance & Public Concern

### Restaurant report card: What's in your fast food meat?

By Michael Nedelman, CNN  
Updated 3:34 PM ET, Thu September 28, 2017



Source: cnn.com

9

## Antimicrobial Resistance & Public Concern

### CHAIN REACTION III



How Top Restaurants Rate on Reducing Use of Antibiotics in Their Meat Supply

Chain Reaction III Scorecard	
A	Truist
B+	SUBWAY
B	Chick-fil-A
B-	YACCO BEEF, WENDY'S
C+	McDonald's
C	Wendy's
D+	Popeyes
D	DUNKIN' DONUTS, Burger King, Oldemark
E	Arby's, KFC, Sizzler, Dairy Queen
F	PIZZA HUT, IHOP, ALOHA, SHERIDAN'S

*"The authors defined a "good" antibiotics use policy as follows: A publicly available company policy that prohibits the use of all antibiotics, or antibiotics in classes used in human medicine, for growth promotion or disease prevention. Treatment of sick animals and temporary use to control an identified disease outbreak are acceptable."*

Source: fda.gov

10

## Antimicrobial Drug Use & Legislation

### Antimicrobials USE & Disease:

- **Disease Prevention:** antimicrobial use when a **known disease risk is present**. Drug can be administered even if **none of the animals in the herd are exhibiting clinical signs** of the disease.
- **Disease Control:** antimicrobial use to decrease the spread of disease when a portion of the animals in the herd have **shown signs of disease** and the clinically sick are being treated (usually individually).
- **Disease Treatment:** antimicrobial use to treat animals that are exhibiting signs of disease.

11



## Antimicrobial Drug Use & Legislation

### Antimicrobials have 3 types of marketing status

- Over-the-counter (OTC) \*\*\*
- Veterinary Prescription (Rx)
- Veterinary Feed Directive (VFD)

}

Require Veterinary Oversight

\*\*\* For medically important antimicrobials

12

**Antimicrobial Drug Use & Legislation**

AMU in Livestock - Legislation

**New Laws on Drug Use**

**Veterinary Feed Directive (VFD)**  
 > Whole USA territory


**California Senate Bill 27 (SB 27)**  
 > California State (California Food and Agriculture Code 14400-14408)

13

**Veterinary Feed Directive**

Principles of Guidance for Industry #209 and #213

**Key Principles:**

1. Limit use of medically important antimicrobial drugs in food-producing animals as growth promoting antimicrobials (GPA)
2. Voluntarily withdraw approved production uses of medically important drugs for production purposes (e.g. improved feed efficiency)
3. Retain treatment, control, and prevention indications 
4. Require transition to veterinary oversight

14

**New Antimicrobial Legislation**

**Veterinarian-Client-Patient-Relationship (VCPR)**

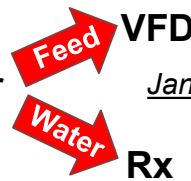
1. "The client has **authorized** the veterinarian to assume responsibility for making **medical judgments** regarding the health of the animal, including the need for medical treatment."
2. "The veterinarian **has sufficient knowledge of the animal(s)** to initiate at least a general or preliminary diagnosis of the medical condition of the animal(s)."
3. "The veterinarian has assumed **responsibility** for making medical judgments regarding the health of the animal and has **communicated with the client** a course of treatment appropriate to the circumstance."

**16 CCR 2032.1**


15

**Antimicrobial Drug Use & Legislation**


**Veterinary Feed Directive (VFD) (21 CFR Parts 514 and 558)**



- **Over-the-counter** Medically important Drug January 1, 2017
- Through a valid Veterinarian-client-patient - relationship (**VCPR**)
- "Extralabel use (ELU) of medicated feed, including VFD feed, is **prohibited** by statute."




16



## Senate Bill 27


### Senate Bill 27 (SB 27)

1. Regulate Antimicrobial Use (Jan, 2018)
2. Stewardship Guidelines
3. Surveys and Studies



Source: [craftveterianinsurance.com/](http://craftveterianinsurance.com/)

17



## Senate Bill 27

### 1. Regulate Antimicrobial Use (in addition to VFD)

- **Over-the-counter** RX – January 1, 2018  
Injectable, Water or Feed  
Medically important Drug
  - Applies to Livestock, but not bees or species kept as pets (dogs, cats, pet birds)
  - Limited to medically important antibiotics (GFI 152)
  - Veterinary Prescription (RX) through a valid VCPR


18

ANTIBIOTIC LIVESTOCK DRUGS IN CALIFORNIA		
Not Medically Important No prescription required	Medically Important Prescription or VFD required as of January 1, 2018	
<b>Aminocoumarins</b> Novobiocin (only available in combination with a MIAD in California)	<b>Aminoglycosides</b> Dihydrostreptomycin*** Gentamicin** (Garacin, Gen-Gard) Hygroscopic B** (Hygromax) Neomycin** (Neo-Sol 50, Neovet) Spectinomycin* (L-S50, Spectinix-50)	<b>Macrolides</b> Erythromycin** (Gallimycin) Gamithromycin*** (Zactran) Tildipirosin*** Tilmicosin (Pulmotil AC) Tulathromycin*** (Draxxin) Tylosin** (Tylan, Tylovet, Tyloved) Tylosin (Avisoxin)
<b>Glycolipids</b> Bambermycins (Gainpro 10, Flavomycin)	<b>Amphenicols</b> Florfenicol*** (Nulflor)	<b>Penicillins</b> Amoxicillin*** Ampicillin** (Polyflex) Cloxacillin*** Penicillin** (Pennchlor, R-Pen, Bacracillin)
<b>Ionophores</b> Laidlomycin*** Lasalocid (Avatec, Bovatec) Monensin (Rumensin, Coban) Narasin (Maxiban, Monteban) Salinomycin (Sancox, Bio-cox)	<b>Cephalosporins</b> Ceftiofur*** (Nexceq, Excede, Excenel) Cephapirin (Today, Tomorrow)	<b>Streptogramins</b> Virginiamycin** (V-max, Stafac)
<b>Pleuromutilins</b> Tiamulin (Denagard, Triamulox)	<b>Diaminopyrimidines</b> Ormetoprim (Rofenaid)	<b>Sulfonamides (Sulfas)</b> Sulfadimethoxine** (Sulfadimed, Albon, Sulfamed) Sulfamerazine** (Poultrysulf) Sulfamethazine** (Poultrysulf, Aureo) Sulfathiazole** (Sul-Q-Nox, Poultrysulf)
<b>Polypeptides</b> Bacitracin (Pennitracin, BMD)	<b>Fluoroquinolones</b> Danofloxacin*** Enrofloxacin*** (Baytril)	<b>Tetracyclines</b> Chlorotetracycline** (ChlorMax, Pennchlor) Oxytetracycline** (LA-200, Duramycin, Bio-Myclin) Tetracycline** (Duramycin, Tetramed)
<b>Quinoxalines</b> Carbadox (Mecadox)	<b>Lincosamides</b> Lincomycin** (Lincosol, Lincosin) Pirlimycin***	
	<b>Polymyxins</b> Polymyxin B (Terramycin)	

\* Feed/water drugs must follow FDA VFD and water prescription requirement as of 1/1/2017.  
 \*\* May be used in feed  
 \*\*\* Federally labeled as prescription-only (regulatory restrictions unchanged by SB 27)

Source: [cdfa.ca.gov/ahfss/aus/docs/AUS\\_Flowchart\\_2018.pdf](http://cdfa.ca.gov/ahfss/aus/docs/AUS_Flowchart_2018.pdf)



19



## Senate Bill 27


### 2. Stewardship Guidelines

- “best management practices for veterinarians and livestock owners and employees”
- Promote responsible/judicious use of antibiotics
- Limit unnecessary use of antimicrobials
- Antibiotics alternatives that are supported by scientific evidence

Source: [cdfa.ca.gov/ahfss/aus/docs/AUS\\_Flowchart\\_2018.pdf](http://cdfa.ca.gov/ahfss/aus/docs/AUS_Flowchart_2018.pdf)



20



## Senate Bill 27

### 3. Surveys and Studies


- Gather information on management practices (including health outcomes), antibiotic sales and use, and resistance in bacteria
- **Confidentiality protected (SB 27 14407)**

Source : countryaidnetwork.com; infovetts.com

21

## BIOSECURITY




SOURCE: INDIANA STATE POULTRY ASSOCIATION

22

## BIOSECURITY

- **Biosecurity** - The outcome of all activities undertaken to preclude the introduction of disease agents into an area
- **Biocontainment** - Control the spread of disease agents that are already present on a farm operation



Th!nk BioRisk

SOURCE: PORK.AHDB.ORG.UK/PIG-PRODUCTION/BIOSECURITY/


23

## BIOSECURITY

- **MAIN GOALS:**


**1**

To limit the spread and occurrence of disease




**2**

To improve overall herd health



**3**

To increase the growth and efficiency of the herd






SOURCE: PORK.AHDB.ORG.UK/PIG-PRODUCTION/BIOSECURITY/

24

## BIOSECURITY

- **Animal Movement**  
e.g. quarantine new animals added to herd, animal identification (ID)
- **Herd Resistance to Disease**  
e.g. vaccination (herd immunity), feeding colostrum, nutrition

Source : cdc.gov, Dr Mary Smith

25

## BIOSECURITY

- **Disease Surveillance/Control**  
e.g. necropsies, standard operational procedures, parasite control
- **Farm Records**  
e.g. log books, software, drug use, disease event, DHI
- **Facilities**  
e.g. Ventilation, sanitation, access to water/feed, stress







Source : cdc.gov, Dr Mary Smith

26


## BIOSECURITY - Sick Animals

- **Disease surveillance**  
**Best prognosis > Early Disease Diagnosis**
  - **Non-therapeutic options** (e.g. oral fluids)
  - **Reduced cost with disease** ( e.g. drug cost, withdraw period, death)
  - **Separate sick animal from health if necessary** (e.g. highly contagious disease)



Source : cdc.gov, vetmed.wisc.edu, calfmuseum.techno-science.ca


27




### Judicious use of Antimicrobials

## Judicious use of antimicrobials in Livestock







Farm Management



Sick Animals



VETER

Source : cdc.gov, prairiefruits.com, infovets.com

28

Questions / Comments



Resources: [cdfa.ca.gov/ahfs/aus/](http://cdfa.ca.gov/ahfs/aus/)