Changes in the Use of Feed-Grade Antibiotics for Livestock

Rachel Endecott, PhD
Beef Cattle Specialist
VFD Short Course 2016

Animal Antibiotics: Methods of Delivery

Injectable

Oral Bolus

Drinking Water

Feed

Slide courtesy Dr. Russ Daly, SDSU
Animal Antibiotics: Currently

Labeled Uses:
- Treatment of disease
- Control of disease
- Prevention of disease
- Feed efficiency
- Growth promotion

Label Claim Examples
### Tylosin Phosphate

For use in Swine, Beef Cattle, and Chicken Feeds Only

**Type A Medicated Article**

**Do Not Feed Undiluted**

Equivalency to 40 g Tylosin per Pound

**Swine:**
- For increased rate of weight gain and improved feed efficiency.
- For maintaining weight gains and feed efficiency in the presence of porcine stress.
- For control of swine dysentery associated with *Brachyspira hyodysenteriae*.
- For the treatment and control of swine dysentery associated with *Rochalimaea hydropathica*.

**For control of porcine proliferative enteropathies (PPE, EPEC) associated with* Lawsonia intracellularis*.

**For increased rate of weight gain and improved feed efficiency.**

**For the treatment and control of swine dysentery associated with* Brachyspira hyodysenteriae* immediately after medicating with Tylosol Soluble (tylosin) in drinking water.

**Beef Cattle:**
- For reduction of incidence of liver abscesses associated with *Aspergillus* spp., *Escherichia coli*, and *Arcobacterium* spp.
- For increased rate of weight gain and improved feed efficiency.

**Laying Chickens:**
- For improved feed efficiency.

**Broilers and Replacement Chickens:**
- To add in the control of Chronic Respiratory Disease associated with *Mycoplasma gallisepticum*.

### CTC 4G

**Medicated Feed Additive**

For use in Swine, Beef Cattle, and Chicken Feeds Only

**Type A Medicated Article**

**Do Not Feed Undiluted**

Equivalency to 40 g Tylosin per Pound

**Swine:**
- For increased rate of weight gain and improved feed efficiency.
- For maintaining weight gains and feed efficiency in the presence of porcine stress.
- For control of swine dysentery associated with *Brachyspira hyodysenteriae*.
- For the treatment and control of swine dysentery associated with *Rochalimaea hydropathica*.

**For control of porcine proliferative enteropathies (PPE, EPEC) associated with* Lawsonia intracellularis*.

**For increased rate of weight gain and improved feed efficiency.**

**For the treatment and control of swine dysentery associated with* Brachyspira hyodysenteriae* immediately after medicating with Tylosol Soluble (tylosin) in drinking water.

**Beef Cattle:**
- For reduction of incidence of liver abscesses associated with *Aspergillus* spp., *Escherichia coli*, and *Arcobacterium* spp.
- For increased rate of weight gain and improved feed efficiency.

**Laying Chickens:**
- For improved feed efficiency.

**Broilers and Replacement Chickens:**
- To add in the control of Chronic Respiratory Disease associated with *Mycoplasma gallisepticum*.

---

**Label Claim Examples**

**Tylosin Phosphate**

- For use in Swine, Beef Cattle, and Chicken Feeds Only
- Type A Medicated Article
- Do Not Feed Undiluted
- Equivalency to 40 g Tylosin per Pound
- Swine: For increased rate of weight gain and improved feed efficiency.
- For maintaining weight gains and feed efficiency in the presence of porcine stress.
- For control of swine dysentery associated with *Brachyspira hyodysenteriae*.
- For the treatment and control of swine dysentery associated with *Rochalimaea hydropathica*.
- For control of porcine proliferative enteropathies (PPE, EPEC) associated with *Lawsonia intracellularis*.
- For increased rate of weight gain and improved feed efficiency.
- For the treatment and control of swine dysentery associated with *Brachyspira hyodysenteriae* immediately after medicating with Tylosol Soluble (tylosin) in drinking water.
- Beef Cattle: For reduction of incidence of liver abscesses associated with *Aspergillus* spp., *Escherichia coli*, and *Arcobacterium* spp.
- For increased rate of weight gain and improved feed efficiency.
- Laying Chickens: For improved feed efficiency.
- Broilers and Replacement Chickens: To add in the control of Chronic Respiratory Disease associated with *Mycoplasma gallisepticum*.

**CTC 4G**

- Medicated Feed Additive
- For use in Swine, Beef Cattle, and Chicken Feeds Only
- Type A Medicated Article
- Do Not Feed Undiluted
- Equivalency to 40 g Tylosin per Pound
- Swine: For increased rate of weight gain and improved feed efficiency.
- For maintaining weight gains and feed efficiency in the presence of porcine stress.
- For control of swine dysentery associated with *Brachyspira hyodysenteriae*.
- For the treatment and control of swine dysentery associated with *Rochalimaea hydropathica*.
- For control of porcine proliferative enteropathies (PPE, EPEC) associated with *Lawsonia intracellularis*.
- For increased rate of weight gain and improved feed efficiency.
- For the treatment and control of swine dysentery associated with *Brachyspira hyodysenteriae* immediately after medicating with Tylosol Soluble (tylosin) in drinking water.
- Beef Cattle: For reduction of incidence of liver abscesses associated with *Aspergillus* spp., *Escherichia coli*, and *Arcobacterium* spp.
- For increased rate of weight gain and improved feed efficiency.
- Laying Chickens: For improved feed efficiency.
- Broilers and Replacement Chickens: To add in the control of Chronic Respiratory Disease associated with *Mycoplasma gallisepticum*. 

---

**Label Claim Examples**
Label Claim Examples

**SWINE**
Increased rate of weight gain and improved feed efficiency (10 to 50 g/ton): Add not less than 2.5 nor more than 12.5 pounds per ton of complete ration.
Reducing the incidence of cervical lymphadenitis (jowl abscesses) caused by group Escherichia streptococci susceptible to Chlorotetracycline. (50 to 100 g/ton): Add not less than 12.5 nor more than 25 pounds per ton of complete ration.
Control of leptospirosis (reducing the incidence of abortion and shedding of leptospires) caused by Leptospira pomona susceptible to Chlorotetracycline.
Feed continuously for not more than 14 days (400g/ton breeding): Add 100 pounds per ton of complete ration.
Treatment of bacterial enteritis caused by Escherichia coli and Salmonella choleraesuis and bacterial pneumonia caused by Pasteurella multocida susceptible to Chlorotetracycline. (10 mg/lb. bodyweight): Add 0.25 lb. per 100 pounds of bodyweight to ration to provide 10 mg/lb. bodyweight. Feed continuously for not more than 14 days.

**Label Claim Examples**

**CALVES (weighing up to 250 lbs.)**
For an increased rate of weight gain and improved feed efficiency. (0.1 mg/lb bodyweight per day) Feed 0.04 oz per 100 pounds bodyweight per day.

**CALVES (250 to 400 lbs.)**
Increased rate of weight gain and improved feed efficiency. (25 to 70 mg/head/day): Feed 0.4 to 1.0 pounds per 57 head per day.

**GROWING CATTLE (over 400 lbs.)**
Increased rate of weight gain, improved feed efficiency and reduction of liver condemnations due to abscesses. (70 mg/head/day): Feed 1.0 pound per 57 head per day.
Label Claim Examples

CALVES, BEEF AND NON-LACTATING DAIRY CATTLE
Treatment of bacterial enteritis caused by Escherichia coli and bacterial pneumonia caused by Pasteurella multocida organisms susceptible to Chlortetracycline. (10 mg/lb. bodyweight daily); Feed 0.25 lb. per 100 pounds bodyweight/day. WARNING: Feed for not more than 5 days. WARNING: Withdraw 24 hours prior to slaughter.

SHEEP (Growing)
Increased rate of weight gain and improved feed efficiency, (20 to 50 g/ton); Add not less than 5 nor more than 12.5 pounds per ton of complete ration.

SHEEP (Breeding)
Reducing the incidence of (vibronic) abortion caused by Campylobacter fetus infection susceptible to Chlortetracycline. (80 mg/head/day: Feed 0.2 lb per 10 head per day.)
## Label Claim Examples

### CHICKENS

<table>
<thead>
<tr>
<th>Claim</th>
<th>Rate</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/day</td>
<td>10-50 g/day</td>
</tr>
</tbody>
</table>

Control of infectious synchiae caused by *Salmonella enterica* susceptible to oxytetracycline 100-200 g/day. Food continuously for 7-14 days.

Control of chronic respiratory disease (CRD) and air sac infections caused by *Mycoplasma gallisepticum* and *Eubacterium coli* susceptible to oxytetracycline 400 g/day. Food continuously for 7-14 days.

Reduction of mortality due to air sac infections (air sac infection) caused by *Eubacterium coli* susceptible to oxytetracycline 500 g/day. Food continuously for 5 days.

**WARNING:** At 500 g/day level, withdraw 24 hours before slaughter. 3-day withdrawal period for lower use levels. Do not administer to chickens producing eggs for human consumption.

### TURKEYS

<table>
<thead>
<tr>
<th>Claim</th>
<th>Rate</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>For growing turkeys for increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/day</td>
<td>10-50 g/day</td>
</tr>
</tbody>
</table>

Control of bronchitis caused by *Pasteurella multocida* susceptible to oxytetracycline 160 g/day. Food continuously for 7-14 days.

Control of infectious synchiae caused by *Salmonella enterica* susceptible to oxytetracycline 200 g/day. Food continuously for 7-14 days.

Control of complicating bacterial organisms associated with turkeys (anaerobic bacteria, non-heat shockable) susceptible to oxytetracycline 25 mg/l of body weight daily. Food continuously for 7-14 days.

**WARNING:** At 200 g/day use level or higher, withdraw 5 days before slaughter. Zero-day withdrawal period for lower use levels. Do not administer to turkeys producing eggs for human consumption.

### SWINE

<table>
<thead>
<tr>
<th>Claim</th>
<th>Rate</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/day</td>
<td>10-50 g/day</td>
</tr>
</tbody>
</table>

Treatment of bovine osteoarthritis caused by *Escherichia coli* and *Salmonella enterica* susceptible to oxytetracycline and treatment of bovine pneumonia caused by *Pasteurella multocida* susceptible to oxytetracycline 10 mg/kg of body weight daily. Food continuously for 7-14 days.

For breeding swine for control and treatment of leptospirosis (reducing the incidence of abortion and shedding of leptospira) caused by *Lactobacillus paracasei* susceptible to oxytetracycline 10 mg/kg of body weight daily. Food continuously for not more than 14 days.

### CALVES INCLUDING PRE-REMINATING (VIELAL) CALVES, BEEF CATTLE, AND NON-REACTING DAIRY CATTLE

<table>
<thead>
<tr>
<th>Claim</th>
<th>Rate</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>For calves (up to 250 lb) for increased rate of weight gain and improved feed efficiency</td>
<td>0.05-0.1 mg/lb of body weight daily</td>
<td>0.05-0.1 mg/lb of body weight daily</td>
</tr>
</tbody>
</table>

For calves (up to 500 lb) for increased rate of weight gain and improved feed efficiency 25 mg/head/day. Food continuously.

For growing cattle over 500 lb for increased rate of weight gain, improved feed efficiency, and reduction of liver condemnation due to liver abscesses 95 mg/head/day. Food continuously.

Prevention and treatment of the early stages of shipping fever complex (first 3-5 days before and after arrival in feedlots) 0.5-2.0 g/haad/day.

Treatment of bovine osteoarthritis caused by *Burkholderia cepacia* and bovine pneumonia complex (shipping fever complex) caused by *Pasteurella multocida* susceptible to oxytetracycline 10 mg/kg of body weight daily. Food continuously for 7-14 days.

### SHEEP

<table>
<thead>
<tr>
<th>Claim</th>
<th>Rate</th>
<th>Dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-20 g/day</td>
<td>10-20 g/day</td>
</tr>
</tbody>
</table>

Treatment of bovine osteoarthritis caused by *Escherichia coli* and bovine pneumonia caused by *Pasteurella multocida* susceptible to oxytetracycline 10 mg/kg of body weight daily. Food continuously for 7-14 days.

**WARNING:** 5-day withdrawal before slaughter at 10 mg/lb dosage.
Label Claim Examples

---

**TYPE A MEDICATED ARTICLE**

Oxytetracycline Antibacterial Premix for use in calf milk replacers or starter feeds for improved feed efficiency and treatment of bacterial enteritis. For Animal Use Only.

**Active Ingredient:** Oxytetracycline Hydrochloride . . . 100 grams/tb.

**Inactive Ingredient:** Sucrose.

**DIRECTIONS FOR USE**

For increased rate of weight gain and improved feed efficiency in replacement calves up to 280 pounds:

**Dose:** 0.1 mg Oxytetracycline per pound body weight per day.

**Mixing Directions:** Mix 0.2 lb. Pennox 100-MR® in 1 ton of milk replacer or starter feed.

**Warning:** Zero-day withdrawal period.

For treatment of bacterial enteritis caused by Escherichia Coli organisms susceptible to Oxytetracycline:

**Dose:** 10 mg Oxytetracycline per pound body weight per day. Feed for 7-14 days.

**Mixing Directions:** Mix 20 lb. Pennox 100-MR® in 1 ton of milk replacer or starter feed.

**Warning:** 5 days withdrawal at 10 mg/lb dosage.
Animal Antibiotics: Currently

Injectable

Oral Bolus

Drinking Water

Feed

What is a VFD?

• Veterinary Feed Directive
  • Paperwork for the drug in question
  • Filled out by a veterinarian
  • Gives description of livestock to be treated, some instructions to the feedmill, expiration date
  • Valid veterinary-client-patient relationship should be in place
  • Feedmill must have VFD before feed can be distributed; must notify FDA
Veterinary Client Patient Relationship (VCPR)

• Veterinarian has assumed responsibility for medical judgments about the animals, client has agreed to follow the vet’s instructions
• 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) and timely visits
• Veterinarian available for follow-up in case of adverse reactions or treatment failure

FDA’s Proposals

• Guidance for Industry #209
  • “The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals”

• Guidance for Industry #213
  • “Recommendations for Drug Sponsors for Voluntarily Aligning Product Use Conditions with GFI #209”
<table>
<thead>
<tr>
<th>FDA Guidance for Industry #209</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The use of medically important antimicrobial drugs in food-producing animals should be limited to those uses that are considered necessary for assuring animal health</td>
</tr>
<tr>
<td>2. The use of medically important antimicrobial drugs in food-producing animals should be limited to those uses that include veterinary oversight or consultation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FDA Guidance for Industry #209</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The use of <strong>medically important</strong> antimicrobial drugs in food-producing animals should be limited to those <strong>uses that are considered necessary for assuring animal health</strong></td>
</tr>
<tr>
<td>2. The use of <strong>medically important</strong> antimicrobial drugs in food-producing animals should be limited to those uses that include <strong>veterinary oversight</strong> or consultation</td>
</tr>
</tbody>
</table>
### FDA Guidance for Industry #209: Medically Important Antibiotics

<table>
<thead>
<tr>
<th>Class of Antibiotic</th>
<th>Feed-Grade Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminoglycosides</td>
<td>Neomycin, Streptomycin</td>
</tr>
<tr>
<td>Lincosamides</td>
<td>Lincomix®</td>
</tr>
<tr>
<td>Macrolides</td>
<td>Pulmotil®</td>
</tr>
<tr>
<td>Penicillins</td>
<td>Penicillin, CSP</td>
</tr>
<tr>
<td>Streptogramins</td>
<td>Stafac®</td>
</tr>
<tr>
<td>Sulfonamides</td>
<td>Sulfamethazine, Aureomix®</td>
</tr>
<tr>
<td>Tetracyclines</td>
<td>Aureomycin®, CTC</td>
</tr>
</tbody>
</table>

### FDA Guidance for Industry #213

- Final as of December 2013
- For the drug companies
- For “medically important antibiotics”
- Asks companies to voluntarily revise their product labels to remove growth promotion and feed efficiency
- Provides for moving OTC products to Rx or VFD status
- Full implementation: December 2016
So... What Will Change?

- Growth promotion uses in feed no longer allowed
  1. Tetracyclines: CTC, Aureomycin, NeoTerra
  2. Stafac (virginiamycin)
- Use of “medically important” feed antibiotics will need a VFD
  - Can only use for treatment, control, prevention
    1. Tetracyclines (CTC, Aureomycin, NeoTerra)
    2. Tylan
    3. Sulfamethazine (Aureomix)
    4. Stafac for liver abscesses
    5. Medicated milk replacers (w/ oxytetracycline, neomycin...)

So... What Will Change?

- Changes to the VFD process
  - Veterinarian keeps original, feedmill & client keep copies
  - No longer need to estimate amount of feed consumed
    - Approximate number of animals
  - Maximum expiration date of 6 months
  - Electronic delivery
# So... What Will Change?

- Who defines a valid Veterinary Client Patient Relationship
  - Will be left to each state’s regulations or veterinary board
  - Veterinarian must be licensed in state where the animals are
  - “Medically important” water medications will move to prescription status

---

# What Won’t Change

- Use of non-“medically important” drugs:
  - Ionophores (Bovatec, Rumensin, etc.)
  - Coccidiosis treatments (Corid, Deccox, etc.)
  - Bacitracin (BMD)
  - Ability to use the same products currently used for treatment, control, prevention
    - But will need a VFD now
  - Injectable medication uses
  - Extra-label uses of feed-grade medications
    - Is illegal now, will continue to be illegal
What Won’t Change

- Ability for current feed mill operators to supply feed medications
  - VFD documentation and records need to be kept
  - VFD drugs will not automatically need to be handled only by licensed feed mills
- Need for veterinarians to be involved in medication decisions

Questions and Discussion
VFD Short Course 2016
Label Claim Examples

Rachel Endecott
MSU Extension Beef Cattle Specialist
rachel.endecott@montana.edu
406-994-3747
Tylosin Phosphate

For use in Swine, Beef Cattle and Chicken Feeds Only
Type A Medicated Article
Do Not Feed Undiluted

Equivalent to 40 g Tylosin per Pound Swine:
For increased rate of weight gain and improved feed efficiency.
For maintaining weight gains and feed efficiency in the presence of atrophic rhinitis.
For control of swine dysentery associated with Brachyspira hyodysenteriae.
For the treatment and control of swine dysentery associated with Brachyspira hyodysenteriae immediately after medicating with Tylan Soluble (tylosin) drinking water.
For control of porcine proliferative enteropathies (PPE, ileitis) associated with Lawsonia intracellularis.
For control of porcine proliferative enteropathies (PPE, ileitis) associated with Lawsonia intracellularis immediately after medicating with Tylan Soluble (tylosin) in drinking water.

For cattle:
For reduction of incidence of liver abscesses associated with Fusobacterium necrophorum and Arcanobacterium pyogenes.

Chickens:
For increased rate of weight gain and improved feed efficiency.
Laying Chickens:
For improved feed efficiency.
Broilers and Replacement Chickens:
To aid in the control of Chronic Respiratory Disease associated with Mycoplasma gallisepticum.

Important: Must be Thoroughly Mixed in Feeds Before Use.
Restricted Drug (California), Use only as Directed.
NADA # 12-491, Approved by FDA
Elanco, Tylan and the diagonal bar are trademarks owned or licensed by Eli Lilly and Company, its subsidiaries or affiliates.
Manufactured For:
Elanco Animal Health • A Division of Eli Lilly and Company
Indianapolis, IN 46285, USA
To report adverse effects, access medical information, or obtain additional product information, call 1-800-428-4441.

Directions for Use
Read All Directions Carefully Before Mixing and Feeding

Type A Medicated Article
Do Not Feed Undiluted.
Active Drug Ingredient—Tylosin (as tylosin phosphate) . . . 40 g per lb
Ingredients: Roughage products, calcium carbonate and mineral oil.
Important: Must be Thoroughly Mixed In Feeds Before Use, To ensure adequate mixing, an intermediate blending step should be used prior to manufacturing a complete feed. Do not use in any finished feed (supplement, concentrate or complete feed) containing in excess of 2% bentonite.
Warning: Tylan 40 may be irritating to unprotected skin and eyes. When mixing and handling Tylan 40 use protective clothing, impervious gloves and a dust respirator. In case of accidental eye exposure, flush eyes with plenty of water. Exposed skin should be washed with plenty of soap and water. Remove and wash contaminated clothing. Seek medical attention if irritation becomes severe or persists. The material safety data sheet (MSDS) contains more detailed occupational safety information. To report adverse effects, access medical information, or obtain additional product information, call 1-800-428-4441.

Mixing and Feeding Directions for Swine Feeds
For increased rate of weight gain and improved feed efficiency.
Pre-Starter or Starter Grower Finisher Feed continuously as the sole ration.

Mixing and Feeding Directions for Tylan 40

<table>
<thead>
<tr>
<th>Feed</th>
<th>Tylan 40 Per Ton Of Type C Feed</th>
<th>Tylson Per Ton Of Type C Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5 to 2.5 lbs</td>
<td>0.2 to 0.25 lbs</td>
</tr>
<tr>
<td></td>
<td>0.5 to 1.0 lbs</td>
<td>0.2 to 0.25 lbs</td>
</tr>
<tr>
<td></td>
<td>0.25 to 0.5 lbs</td>
<td>0.2 to 0.25 lbs</td>
</tr>
</tbody>
</table>

For maintaining weight gains and feed efficiency in the presence of atrophic rhinitis.
Feed 100 g of tylosin per ton (2.5 pounds Tylan 40 per ton) of complete feed. Feed continuously as the sole ration.

For control of swine dysentery. Feed 100 g of tylosin per ton (2.5 pounds Tylan 40 per ton) of complete feed for at least three weeks. Follow with 40 g tylosin per ton (1 pound Tylan 40 per ton) of complete feed until pigs reach market weight.

For the treatment and control of swine dysentery. Feed 40 to 100 grams of tylosin (1.0 to 2.5 pounds of Tylan 40) per ton of complete feed for 2 to 6 weeks immediately after medicating with 250 mg tylosin (as Tylan Soluble) per gallon in drinking water for 3 to 10 days.

For control of porcine proliferative enteropathies (PPE, ileitis). Feed 100 g of tylosin per ton (2.5 pounds Tylan 40 per ton) of complete feed for 21 days. Alternatively, feed 100 g of tylosin per ton (2.5 pounds Tylan 40 per ton) of complete feed for at least three weeks, followed by 40 g tylosin per ton of complete feed until pigs reach market weight. Alternatively, feed 40 to 100 grams of tylosin (1.0 to 2.5 pounds of Tylan 40) per ton of complete feed for 2 to 6 weeks immediately after medicating with 250 mg tylosin (as Tylan Soluble) per gallon in drinking water for 3 to 10 days. Feed continuously as the sole ration when feeding Tylan. Diagnosis should be confirmed by a veterinarian when results are not satisfactory.

NOTICE: Organisms vary in their degree of susceptibility to any chemotherapeutic. If no improvement is observed after recommended treatment, diagnosis and susceptibility should be reconfirmed.

Mixing and Feeding Directions for Beef Cattle Feeds
For reduction of incidence of liver abscesses in beef cattle associated with Fusobacterium necrophorum and Arcanobacterium pyogenes.

Mixing Directions for Liquid Type B Cattle Feeds
LIMITATIONS:
1. pH must be between 4.5 and 6.0.
2. For liquid feeds stored in recirculating tank systems:
   Recirculate immediately prior to use for not less than 10 minutes, moving not less than 1 percent of the tank contents per minute from the bottom of the tank to the top. Recirculate daily as described even when not used.
3. For liquid feeds stored in mechanical, air, or other agitation-type tank system: Agitate immediately prior to use for not less than 10 minutes, creating a turbulence at the bottom of the tank that is visible at the top. Agitate daily as described even when not used.
4. Liquid Type B Cattle Feeds must bear an expiration date of 31 days after the date of manufacture.

Mixing and Feeding Directions for Chicken Feeds
For increased rate of weight gain and improved feed efficiency.

Mixing and Feeding Directions for Broiler and Replacement Chickens
To aid in the control of chronic respiratory disease associated with Mycoplasma gallisepticum.

Mixing and Feeding Directions for Tylan 40

<table>
<thead>
<tr>
<th>Feed</th>
<th>Tylan 40 Per Ton Of Type C Feed</th>
<th>Tylson Per Ton Of Type C Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.1 to 1.25 lbs</td>
<td>4 to 50 lbs</td>
</tr>
</tbody>
</table>

Feed continuously as the sole ration.

Mixing and Feeding Directions for Broiler and Replacement Chickens
Broilers Replacement Chickens
20 to 25 lbs
25 lbs
800 to 1000g
1000g

For Broiler and Replacement Chickens: Administer in the feed to chickens 0 to 5 days of age, follow with second administration in feed for 24 to 48 hours at 3 to 5 weeks of age.

NOT FOR HUMAN USE

WARNING: Withdraw 5 days before slaughter when fed to chickens at 800 to 1000 grams per ton.

Mixing and Feeding Directions for Laying Chickens
For improved feed efficiency.

Mixing and Feeding Directions for Tylan 40

<table>
<thead>
<tr>
<th>Feed</th>
<th>Tylan 40 Per Ton Of Type C Feed</th>
<th>Tylson Per Ton Of Type C Feed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.5 to 1.25 lbs</td>
<td>20 to 50 g</td>
</tr>
</tbody>
</table>

Store at Room Temperature, 25°C (77°F). Avoid moisture. Not to be used after the date printed on the bottom of the bag.
CTC 4G
MEDICATED

The medicated claims for different species are given with the feeding directions later in this label.

ACTIVE DRUG INGREDIENT
Chlortetracycline .............................................. 4 g/lb

GUARANTEED ANALYSIS
Crude Protein  not less than  9.5  
Crude Fat  not less than  2.0  
Crude Fiber  not more than  27.0  

INGREDIENTS
Roughage Products, Calcium Carbonate, Processed Grain Byproducts, Molasses Products.

FEEDING DIRECTIONS
Spread recommended dose of CTC 4G MEDICATED on top of feed when each animal is fed individually; otherwise, mix thoroughly in each day’s ration.

SIXE
Increased rate of weight gain and improved feed efficiency (10 to 50 g/ton): Add not less than 2.5 nor more than 12.5 pounds per ton of complete ration.
Reducing the incidence of cervical lymphadenitis (jowl abscesses) caused by group Escherichia streptococci susceptible to Chlortetracycline. (50 to 100 g/ton): Add not less than 12.5 nor more than 25 pounds per ton of complete ration.
Control of leptospirosis (reducing the incidence of abortion and shedding of leptospirae) caused by Leptospira pomona susceptible to Chlortetracycline. Feed continuously for not more than 14 days (400g/ton breeding): Add 100 pounds per ton of complete ration.
Treatment of bacterial enteritis caused by Escherichia coli and Salmonella choleraesuis and bacterial pneumonia caused by Pasteurella multocida susceptible to Chlortetracycline. (10 mg/lb. bodyweight): Add 0.25 lb. per 100 pounds of bodyweight to ration to provide 10 mg/lb. bodyweight. Feed continuously for not more than 14 days.
CALVES (weighing up to 250 lbs.)
For an increased rate of weight gain and improved feed efficiency. (0.1 mg/lb bodyweight per day) Feed 0.04 oz per 100 pounds bodyweight per day.
CALVES (250 to 400 lbs.)
Increased rate of weight gain and improved feed efficiency. (25 to 70 mg/head/day): Feed 0.4 to 1.0 pounds per 57 head per day.

GROWING CATTLE (over 400 lbs.)
Increased rate of weight gain, improved feed efficiency and reduction of liver condemnations due to abscesses. (70 mg/head/day): Feed 1.0 pound per 57 head per day.

CATTLE
Control of bacterial pneumonia associated with shipping fever complex caused by Pasteurella spp. susceptible to Chlortetracycline. (350 mg/head/day): Feed 1.75 pounds per 20 head per day. Feed 8.75 pounds per 100 head per day.
WARNING: Withdraw 48 hours prior to slaughter.

BEEF CATTLE (Under 700 lbs.)
Control of active infection of anaplasmosis caused by Anaplasma marginale susceptible to Chlortetracycline. (350 mg/head/day): Feed 1.75 pounds per 20 head per day. Feed 8.75 pounds per 100 head per day. WARNING: Withdraw 48 hours prior to slaughter.

BEEF CATTLE (Over 700 lbs.)
Control of active infection of anaplasmosis caused by Anaplasma marginale susceptible to Chlortetracycline. (0.5 mg/lb. of bodyweight): Feed 0.0125 lb. per 100 pounds of bodyweight. WARNING: Withdraw 48 hours prior to slaughter.

CALVES, BEEF AND NON-LACTATING DAIRY CATTLE
Treatment of bacterial enteritis caused by Escherichia coli and bacterial pneumonia caused by Pasteurella multocida organisms susceptible to Chlortetracycline. (10 mg/lb. bodyweight daily): Feed 0.25 lb. per 100 pounds bodyweight/day. WARNING: Feed for not more than 5 days. WARNING: Withdraw 24 hours prior to slaughter.

SHEEP (Growing)
Increased rate of weight gain and improved feed efficiency. (20 to 50 g/ton): Add not less than 5 nor more than 12.5 pounds per ton of complete ration.

SHEEP (Breeding)
Reducing the incidence of (vibrionic) abortion caused by Campylobacter fetus infection susceptible to Chlortetracycline. (80 mg/head/day: Feed 0.2 lb per 10 head per day.
WARNING: A withdrawal period has not been established for this product in pre-ruminating calves. Do not use in calves to be processed for veal. LIMITATIONS: Feed for not more than 5 days. Feed approximately 400g/ton varying with bodyweight and feed consumption to provide 10 mg/lb. per day.

2728.
**Description:**
*Terramycin* is a broad-spectrum anti-infective that has been proven effective against a wide variety of infectious diseases caused by susceptible Gram-positive and Gram-negative bacteria. It can be fed to chickens, turkeys, swine, beef cattle, non-lactating dairy cattle and sheep. *Terramycin* is safe, stable and highly effective; it works in both the bloodstream and in the gastrointestinal tract.

**Active Ingredient:**
Oxytetracycline .................................200 g/lb (from oxytetracycline dihydrate base) equivalent to oxytetracycline hydrochloride

**Registered Claims and Directions for Use:**
See Table 1 for the registered claims and usage directions of *Terramycin* 200.

**Mixing Directions:**
Thoroughly mix the amount of this premix according to the directions indicated in Table 1 with at least an equal amount by weight of feed formula ingredients prior to blending into a complete feed.

For use in dry feeds only. Not for use in liquid feed supplements.

Store at room temperature.

**Caution:**
For use in manufacturing medicated animals feeds only.

Certain components of animal feeds, including medicated premixes, possess properties that may be a potential health hazard or a source of personal discomfort to certain individuals who are exposed to them. Human exposure should, therefore, be minimized by observing the general industry standards for occupational health and safety.

Precautions such as the following should be considered: dust masks or respirators and protective clothing should be worn; dust-arresting equipment and adequate ventilation should be utilized; personal hygiene should be observed; wash before eating or leaving a work site; be alert for signs of allergic reactions - seek prompt medical treatment if such reactions are suspected.
### Table 1. Registered Claims and Directions for Use

<table>
<thead>
<tr>
<th>Indications for Use</th>
<th>Oxytetracycline Amount</th>
<th>lb of Terramycin 200/ton</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHICKENS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/ton Feed continuously</td>
<td>0.05-0.25</td>
</tr>
<tr>
<td>Control of infectious synovitis caused by <em>Mycoplasma synoviae</em>; control of fowl cholera caused by <em>Pasteurella multocida</em> susceptible to oxytetracycline</td>
<td>100-200 g/ton Feed continuously for 7-14 days</td>
<td>0.5-1</td>
</tr>
<tr>
<td>Control of chronic respiratory disease (CRD) and air sac infection caused by <em>Mycoplasma gallisepticum</em> and <em>Escherichia coli</em> susceptible to oxytetracycline</td>
<td>400 g/ton Feed continuously for 7-14 days</td>
<td>2</td>
</tr>
<tr>
<td>Reduction of mortality due to airsacculitis (air sac infection) caused by <em>Escherichia coli</em> susceptible to oxytetracycline</td>
<td>500 g/ton Feed continuously for 5 days</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>TURKEYS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For growing turkeys for increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/ton Feed continuously</td>
<td>0.05-0.25</td>
</tr>
<tr>
<td>Control of hexamitiasis caused by <em>Hexamita meleagris</em> susceptible to oxytetracycline</td>
<td>100 g/ton Feed continuously for 7-14 days</td>
<td>0.5</td>
</tr>
<tr>
<td>Control of infectious synovitis caused by <em>Mycoplasma synoviae</em> susceptible to oxytetracycline</td>
<td>200 g/ton Feed continuously for 7-14 days</td>
<td>1</td>
</tr>
<tr>
<td>Control of complicating bacterial organisms associated with bluecomb (transmissible enteritis, coronaviral enteritis) susceptible to oxytetracycline</td>
<td>25 mg/lb of body weight daily Feed continuously for 7-14 days</td>
<td>4.15</td>
</tr>
<tr>
<td><strong>SWINE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-50 g/ton Feed continuously</td>
<td>0.05-0.25</td>
</tr>
<tr>
<td>Treatment of bacterial enteritis caused by <em>Escherichia coli</em> and <em>Salmonella choleraesuis</em> susceptible to oxytetracycline and treatment of bacterial pneumonia caused by <em>Pasteurella multocida</em> susceptible to oxytetracycline</td>
<td>10 mg/lb of body weight daily Feed continuously for 7-14 days</td>
<td>2.5</td>
</tr>
<tr>
<td>For breeding swine for control and treatment of Leptospirosis (reducing the incidence of abortion and shedding of leptospires) caused by <em>Leptospira pomona</em> susceptible to oxytetracycline</td>
<td>10 mg/lb of body weight daily Feed continuously for not more than 14 days</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>CALVES INCLUDING PRE-RUMINATING (VEAL) CALVES, BEEF CATTLE, AND NONLACTATING DAIRY CATTLE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For calves (up to 250 lb) for increased rate of weight gain and improved feed efficiency</td>
<td>0.05-0.1 mg/lb of body weight daily Feed continuously</td>
<td>0.025-0.5</td>
</tr>
<tr>
<td>For calves (250-400 lb) for increased rate of weight gain and improved feed efficiency</td>
<td>25 mg/head/day Feed continuously</td>
<td>0.125</td>
</tr>
<tr>
<td>For growing cattle (over 400 lb) for increased rate of weight gain, improved feed efficiency, and reduction of liver condemnations due to liver abscesses</td>
<td>75 mg/head/day Feed continuously</td>
<td>0.375</td>
</tr>
<tr>
<td>Prevention and treatment of the early stages of shipping fever complex (Feed 3-5 days before and after arrival in feedlots)</td>
<td>0.5-2.0 g/head/day</td>
<td>2.5-10</td>
</tr>
<tr>
<td>Treatment of bacterial enteritis caused by <em>Escherichia coli</em> and bacterial pneumonia (shipping fever complex) caused by <em>Pasteurella multocida</em> susceptible to oxytetracycline</td>
<td>10 mg/lb of body weight daily Feed continuously for 7-14 days</td>
<td>25</td>
</tr>
<tr>
<td><strong>SHEEP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased rate of weight gain and improved feed efficiency</td>
<td>10-20g/ton Feed continuously</td>
<td>0.05-0.1</td>
</tr>
<tr>
<td>Treatment of bacterial enteritis caused by <em>Escherichia coli</em> and bacterial pneumonia caused by <em>Pasteurella multocida</em> susceptible to oxytetracycline</td>
<td>10 mg/lb of body weight daily Feed continuously for 7-14 days</td>
<td>6</td>
</tr>
</tbody>
</table>

**WARNING:** 5-day withdrawal before slaughter at 10 mg/lb dosage.

1. If bird weights 10 lb, consuming 0.6 lb of complete feed per day
2. If pig weights 100 lb, consuming 4 lb of complete feed per day
3. If calf weighs 100 lb, consuming 2 lb of complete starter feed per day
4. Include in feed supplement based on consumption of 2 lb of supplement per head per day
5. If animal weighs 500 lb, consuming 2 lb of supplement per head per day
6. If lamb weighs 60 lb, consuming 1 lb of supplement per head per day
Pennox 100-MR®

NADA 138-938 APPROVED BY FDA

PRODUCT DESCRIPTION
Pharmgate’s Pennox 100-MR® is an antibiotic formulation containing 100 grams Oxytetracycline Hydrochloride per pound. This formulation allows for convenient mixing and has good palatability. The product is indicated for treatment of bacterial enteritis in calves.

POTENCY
100 grams Oxytetracycline HCl per pound.

ACTIVE INGREDIENT
Oxytetracycline HCl

CARRIER
Sucrose.

COLOR
Soft yellow powder.

SOLUBILITY
Excellent.

BULK DENSITY
Approximately 70 lb./cu. ft.

FLOWABILITY
Excellent.

PALATABILITY
Excellent.

COMPATIBILITY
Compatible with most milk replacer formulas.

STABILITY
Excellent stability in original container.

DIRECTIONS FOR USE
See label instructions.

PACKAGING
25# plastic pails.
TYPE A MEDICATED ARTICLE

Oxytetracycline Antibacterial Premix for use in calf milk replacers or starter feeds for improved feed efficiency and treatment of bacterial enteritis. For Animal Use Only.

Active Ingredient: Oxytetracycline Hydrochloride . . . 100 grams/lb.

Inactive Ingredient: Sucrose.

DIRECTIONS FOR USE

For An Increased Rate of Weight Gain and Improved Feed Efficiency in Replacement Calves Up To 250 Pounds:

Dose: 0.1 mg Oxytetracycline per pound body weight per day.

Mixing Directions: Mix 0.2 lb. Pennox 100-MR® in 1 ton of milk replacer or starter feed.

Warning: Zero-day withdrawal period.

For treatment of Bacterial Enteritis Caused by Escherichia Coli Organisms Susceptible to Oxytetracycline:

Dose: 10 mg Oxytetracycline per pound body weight per day. Feed for 7-14 days.

Mixing Directions: Mix 20 lb. Pennox 100-MR® in 1 ton of milk replacer or starter feed.

Warning: 5 days withdrawal at 10 mg/lb dosage.

Feeding Directions for Milk Replacers or Starter Feeds

<table>
<thead>
<tr>
<th>Body Weight of Calf</th>
<th>75 lbs.</th>
<th>100 lbs.</th>
<th>150 lbs.</th>
<th>250 lbs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of Milk Replacer or Starter Feed for Calf Per Day</td>
<td>0.75 lbs.</td>
<td>1.0 lbs.</td>
<td>1.5 lbs.</td>
<td>2.5 lbs.</td>
</tr>
</tbody>
</table>

NADA 138-938

APPROVED BY FDA

Distributed by PharmGate Animal Health

14040 Industrial Rd. Omaha, NE 68144

“Restricted Drug (CA): Use only as directed” Not for Human Use Livestock Remedy