



Bovine Pharmacology



Beef Quality Assurance Program

Purpose

- Supply only quality beef
- Improve consumer perception of beef's safety
- Elimination of drug residues
- Elimination of edible tissue blemishes and damage

Permanent, unique, identification of all treated animals

- Ear tags are usually used. Record all tags numbers, if there are multiple tags present.
- Tattoo
- Freeze brand ID
- Ear tags can be lost. Tattoos and freeze brands are more permanent. If a tattoo or freeze brand is present, note them in addition to the ear tag numbers.



Accurate written or computerized record of each treated animal

- This is just as important as the permanent ID in adhering to a proper milk or meat, drug withdrawal time
- This is the responsibility of the owner or manager, and the person that administered the treatment. They are the responsible party in the sale of the food animal.
- If the veterinarian administers the treatment, a written record must be left with management.
- The record should include: diagnostics, diagnosis, procedures and therapeutic agents, dosage and route for each pharmaceutical, instructions for re-treatment, Meat and milk withdrawal time and preferably the drug clearance date.
- Pre-Slaughter and Milk Withholding withdrawal times, are always calculated after the last treatment date and time
- Must comply with label
- Must use proper route of administration



Prevention of muscle damage can be achieved through proper drug administration

- Cleanliness - use sterile techniques
- Proper restraint
- Proper injection procedures
- Proper implant placement
- Use appropriate size needle for route of administration
- Use sharp needles
- It is best not to inject when an animal is wet
- Proper restraint assures proper administration



Routes of administration in order of preference

- **Oral** - This route of administration is preferable to any type of injection, when it is possible.
- **Intravenous** - the only route of administration for some drugs, jugular vein in most cases
Minimizes the risk of muscle damage
14 to 18 ga. 1½ to 2 inch
- **Subcutaneous** - preferred injection site for beef cattle
On neck, behind the shoulder or at base of the ear, use a 16 to 18 ga. ½ to ¾ inch. A short or B bevel needle will help avoid muscle damage.
Anabolic implants - Properly placed SQ on convex surface of ear
- **Intramuscular** - If IM is required, use of the muscle group in the middle of the neck.
Use 1 to 1½ inch needles.
The neck muscles are preferable to any other muscle groups in most species of food animals.



Extra Label Drug Use

- **AMDUCA** - FDA's "Animal Medical Drug Use Clarification Act" allows Extra label drug use when:
- A valid Patient - Client - Veterinarian relationship must exist
- A diagnosis must be directly made by a veterinarian
- Adequate permanent identification must be applied to the patient



The prescribing veterinarian must determine that:

1. There are no approved drugs specifically labeled to treat the condition diagnosed.
2. Or, an approved drug's label dosage is ineffective in treating the diagnosed condition.
3. The condition to be treated is a life or performance threatening medical emergency.
4. No illegal drugs may be used (illegal for use in food animals)
5. A significantly extended period of time is assigned for the drug withdrawal, in order to assure that there is no chance of a violative meat or milk drug residue.



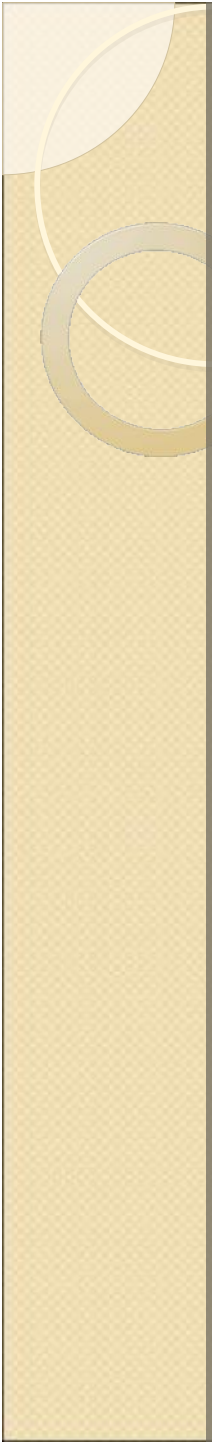
Illegal drugs in Food Animals

- Diethylstilbestrol (DES) – Carcinogenic
- Chloramphenicol - Aplastic anemia in people
- Fluoroquinolones – (Enrofloxacin) - Can not be stored on dairy farms
- Dipyrone - Toxic in humans
- Nitroimidazoles - (e.g. Metronidazole) Carcinogenic
- Nitrofurans - Carcinogenic
- Sulfonamide- (lactating cattle)
- Clenbuterol- (bronchodilator: an equine oral preparation named: Ventipulmin) no human or food animal use in the U.S.
- Glycopeptides- (Vancomycin) used to treat MRSA in humans
- Buteazolidin - Can be toxic to humans



Common antibiotics used in food animals

- Oxytetracycline,
many brand names IV, IM, SQ all species
- Beta Lactam IM, SQ all species, also IV with some preparations
Penicillin: many brand names IM, SQ
Ceftiofur (a cephalosporin): Naxel IM or IV,
Excenel IM, Excede SQ long acting
recently generics are available (Equiv. to Naxel)
- Nuflor, IM or SQ cattle, Oral swine
an analog of chloramphenicol that does not cause aplastic anemia

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- Macrolide, very good for respiratory disease
 - Erythromycin - IM in cattle,
 - Intramammary in dairy cattle
 - Oral in swine and poultry
 - Tilmicosin - Micotil SQ, Long Acting (L.A.),
 - Cardio-toxic in nearly all species except cattle & sheep
 - Tulathromycin - Draxxin, SQ L.A. in cattle, IM swine
 - Gamithromycin - Zactran , SQ L.A. in cattle
 - Tildipirosin – Zuprevo, SQ L.A. in cattle
 - Fluoroquinolone bovine & swine respiratory disease
 - Enrofloxacin - Baytril 100, SQ cattle & swine
 - Labeled for respiratory disease only.
 - Cannot be used in any extra label applications.

EQUINE PHARMACOLOGY





Commonly used antibiotics

Gentamicin: “Gentocin”

Category: Aminoglycoside

Uses: Antibiotic (IV, IM, intrauterine)

**Nephrotoxicity in dehydrated horses, or when given excessively.

Amikacin Sulfate: “Amiglyde”

Category: Aminoglycoside

Use: Antibiotic (IV, IM, Intra-uterine)

Intra-articular use

Ceftiofur sodium: “Naxcel”

Category: Beta-Lactam, Cephalosporin

Uses: Antibiotic (IV, IM, intrauterine)

Hypersensitivity reactions, Diarrhea,

Stings when given IM.



Enrofloxacin: “Baytril”

Use: Antibiotic (IV, PO)

Chloramphenicol:

Use: Antibiotic (PO, IV, IM, SQ)

**Can cause aplastic anemia in humans

Metronidazole: “Flagyl”

Uses: Antibiotics (anaerobes), Anti-protozoal (PO, IV, per rectum)

Can cause anorexia

Per rectum dose: Double PO dose

Polymyxin-B:

Uses: Anti-endotoxin (IV)

**Must be given slowly, otherwise hypersensitivity reactions may occur.

Procaine Penicillin G: “PPG”

Uses: Antibiotic (IM only!!!)

**Can cause extreme reactions and death if given IV





Commonly Used Anti-Inflammatories

Flunixin Meglumine: “Banamine”

Uses: NSAID (IV, PO)

Common for visceral use

Can cause abscess if give IM

Nephrotoxic, Colitis

Phenylbutazone: “Bute”

Uses: NSAID (IV, PO)

Common for musculoskeletal use

Tissue necrosis and sloughing if given perivascular

GI ulceration, Nephrotoxic

Ketoprofen: “Ketofen”

Uses: Anti-inflammatory, Laminitis (IV)

GI ulceration, mild hepatitis



Commonly Used Sedation, Tranquilization, Analgesics

Acepromazine: “Promace”

Uses: Tranquilizer, Vasodilator (Laminitis)

(IV, IM, PO)

Can cause hypotension

May cause penile prolapse.

*****DO NOT USE IN STALLIONS*****

Xylazine: “Rompun”

Uses: Sedative, Analgesic (IV, IM)

****Bradycardia**

**** 2 degree AV block**

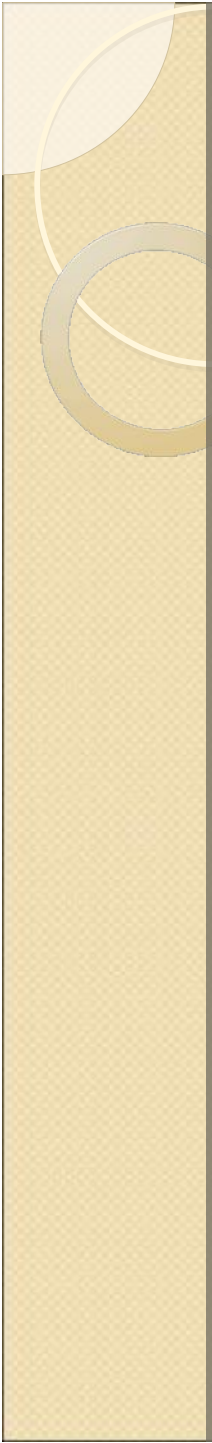
****Sweating**

****Reversal: Yohimbine**

Detomidine HCL: “Dormosedan”

Uses: Sedation, Analgesia (IV, IM)

Can cause hypotension



Butorphanol: “Torbugesic”

Uses: Analgesic (IM, IV)

**Can cause the “jitters” (CNS excitement)

**Can be used as a CRI for long-term pain management.



Other Miscellaneous drugs used in Equine Medicine

Buscopan:

Butylscopolamine (anti-cramping) is an Anticholinergic

Uses: Decrease colonic spasms (IV)

**Contraindicated in pregnant mares

**Can cause tachycardia

Domperidone:

Is an anti-dopaminergic drug

Increases GI peristalsis, anti-emetic, and as a side effect it will stimulate prolactin release by the anterior pituitary gland

Uses: Treatment for agalactia (PO)

Dimethyl Sulfoxide: DMSO

Uses: Anti-inflammatory, Free-radical scavenger (Topical, IV)

**Wear gloves!!! Absorbed through the skin

(Used as a vehicle for other drugs)

Thanks for your attention...

