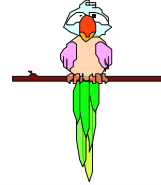


## The Basics of Veterinary Compounding



Dana Reed-Kane, Pharm.D., FIACP, FACA  
Reed's Compounding Pharmacy  
Tucson, Arizona USA  
dana@reedsrx.com



Richard B. Moon, Pharm.D., RPh, FIACP  
Pharmacy Innovations  
Jamestown, NY USA  
rich@pharmacyinnovations.net

### Objectives:


- Suggest ideas for developing or expanding your veterinary compounding practice.
- Share helpful marketing tips
- Discuss flavoring for different types of animals.
- Share unique dosage forms and compounding bases.
- Discuss common veterinary prescriptions





**Reed's**  
COMPOUNDING  
PHARMACY

- Location: Tucson, Arizona USA
- Established: July 10, 1998
- Property: 688 sq. ft. upon opening and since has expanded to 1576 sq. ft.
- Average # of compounds per day: 100
- Percent of veterinary business: 5-10%

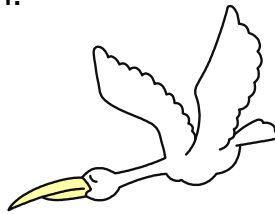


**PHARMACY**  
INNOVATIONS

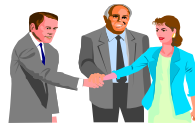
- Location: New York and Pennsylvania USA
- Established: September 1994
- Property: Ave of 3800 sq. ft.
- Average # of compounds per day: 75
- Percent of veterinary business: 5-10%

## Designing Your Pharmacy:

- Veterinary Compounding requires very little supplies and equipment to get started.
- A big imagination is a must!
- Public Viewing Area is great!
- Designated space or a lab is ideal.
- As your business grows, so will your imagination.

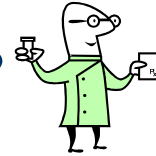


## Marketing Tips:



- Signage
- Newsletters
- Brochures
- Business Cards
- Public Speaking
- Advertising
  - Newspaper
  - Radio
  - Television
- Messages on Hold
- Bag Stuffers and Flyers
- Word of Mouth
- Web Site
- Visit Vet offices
- Attend Vet Meetings
- Press Releases
- Direct To Consumer

## Why compound for animals?



- Medication is not available commercially
- Animal refuses commercial medication
  - Medication needs flavoring
  - Alternate dosage form required
- Individualized medications
  - Pets of various species and weights may require different medication strengths to optimize treatment
  - Multiple medications can be combined in one formulation

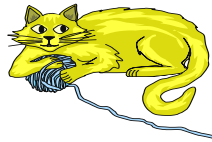
## Veterinary Flavors:

- |                         |                  |                       |
|-------------------------|------------------|-----------------------|
| ■ Apple                 | ■ Cod Liver Oil  | ■ Raspberry           |
| ■ Apricot               | ■ Egnog          | ■ Raspberry Crème     |
| ■ Banana Crème          | ■ English Toffee | ■ Salmon              |
| ■ Beef                  | ■ Grape          | ■ Sardine             |
| ■ Blackberry            | ■ Ham Chowder    | ■ Spinach Extract     |
| ■ Blueberry             | ■ Honey          | ■ Strawberry          |
| ■ Butter                | ■ Lamb Sauce     | ■ Sweet Potato Crispy |
| ■ Butterscotch          | ■ Lemon          | ■ Tangerine           |
| ■ Cantaloupe Crème      | ■ Lemon Custard  | ■ Triple Fish         |
| ■ Carrot Crème          | ■ Lettuce Salad  | ■ Tuna                |
| ■ Cheese                | ■ Liver          | ■ Tutti-Frutti        |
| ■ Cherry                | ■ Malt           | ■ Vanilla             |
| ■ Cherry Custard        | ■ Marshmallow    | ■ Vanilla Butternut   |
| ■ Chicken               | ■ Molasses       | ■ Watermelon          |
| ■ Chicken Liver         | ■ Orange         | ■ Yam Slush           |
| ■ Chocolate             | ■ Peach          |                       |
| ■ Chocolate Custard     | ■ Peanut Butter  |                       |
| ■ Chocolate Marshmallow | ■ Pina Colada    |                       |

## Flavor Secrets:

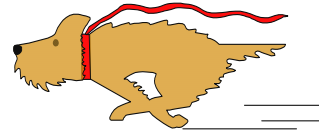
### ■ Cats:

- Tuna, Chicken, Beef, Liver, Sardines, Molasses, Malt, Peanut Butter, Cheese, Lamb, Marshmallow, Butterscotch, Triple Fish (Tuna, Salmon, Sardines)



### ■ Dogs:

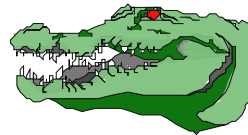
- Liver, Beef, Chicken, Peanut Butter, Cod Liver Oil, Cheese, Malt, Marshmallow, Strawberry, Raspberry, Molasses, Chocolate\*



\* Dogs should not consume chocolate, but chocolate flavor is made from blend of alde-hydes, thus, it is safe for consumption.

## Flavor Secrets:

- **Horses:** Molasses, Cherry, Apple, Sweets
- **Reptiles:** Lemon-Custard, Banana Crème
- **Chinchillas and Rabbits:** Banana Crème
- **Coyotes:** Watermelon
- **Primates (Gorillas):** Banana, Raspberry (some gorillas don't like bananas)
- **Cattle:** Egnog
- **Avian:** Banana, Orange, Tutti-Frutti, Raspberry



- **Rodents:** Cheese, Lemon-Custard, Banana Crème, Peanut Butter, Vanilla Butternut, Orange
- **Ratites:** Alfalfa Hay, Celery (Are attracted to bright colors: Yellow-EMU, Green-Ostriches)
- **Poultry:** Watermelon
- **Sea Lions:** Salt (give inside fish)
- **Ferret:** Malt, Banana, Vanilla Butternut

## Dosage Forms:



- Many administration route options
  - **Oral:** Troche, solution, emulsion, suspension, paste, gel, capsule, tablet, powders
  - **Injection:** Intravenous, intramuscular, subcutaneous
  - **Implants:** Infusion device, sub dermal implants
  - **Topical:** Lotion, cream, ointment, solution, suspension, PLO gel, emulsion, patch
  - **Body cavity:** Suppository, enema, otic, ophthalmic, intranasal

## Suspension

- Preparation:
  - Add a wetting agent to required drug
    - Wetting agents
      - Water based: Glycerin, Polysorbate 80
      - Oil based: Oil (mineral, peanut, olive, etc)
  - Add flavor (water or oil miscible dependent on drug)
    - Start at about 4% depending on the flavor/base
  - QS to desired amount with oil, water, or flavor depending on drug
- Administration
  - Use syringe to administer desired dose into animals mouth, food or dish
- Storage
  - Water based: Refrigerate
  - Oil based: Room Temperature. Do not store in refrigerator due to solidification of oil



## Triple Fish Suspension Base

### ■ Ingredients:

- Tuna Fish 12 oz.
- Salmon 14.75 oz.
- Sardines 4.25 oz.

### ■ Instructions:

- Blend fish ingredients into a puree
- Add 2.4 g. Potassium Sorbate (preservative)
- Add 2.4 g. Xanthum gum (thickening agent)
- QS with purified water to 1600mL.

- Glycerin is the best wetting agent for drugs suspended in triple fish



## PLO Gel

### ■ Preparation:

- Mixture of pluronic gel, lecithin, and drug required

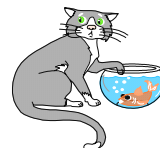
### ■ Administration:

- Owner must use a glove or finger cot to avoid absorbing medication
- Apply to the inner hairless portion of the cat's ear (pinna) and rub until completely absorbed
- Avoid getting gel inside the ear canal

### ■ Reverse Gel Properties:

- Solid when HOT
- Liquid when COLD

## Suspension Bases:



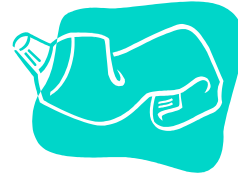
- **Methylcellulose 1-3% gel prepared with purified or preserved water**
  - Add stevia(0.1-0.2%) or nutrasweet(0.1-0.2%) to sweeten
  - Add sodium chloride to give a salty taste
  - Good for use with water soluble flavors
- **Fixed oils (peanut, sardine, cod liver, tuna, almond, olive, sesame, etc.)**
  - Use 2-6% micronized silica as suspending agent if needed
  - Good for use with oil soluble and aldehyde flavors

## Suspension Bases:



- **Xanthan Gum 1-3% Suspension prepared with purified or preserved water**
  - Add stevia(0.1-0.2%) or nutrasweet(0.1-0.2%) to sweeten
  - Add sodium chloride to give a salty taste
  - Good for use with water soluble flavors
- **Lipton's® Chicken Noodle Soup**
- **Chicken or Beef Bouillon**
- **Malt and Molasses Syrup**
  - Molasses is an excellent vehicle for masking bitter drugs

## Other Unique Bases:



- Pounce ® or other canned dog or cat food
- Peanut Butter
- Baby Food
- Other Animals
- Tuna, Salmon, Sardines, Anchovies

## Why you should get involved with veterinary Compounding?

- Unique compounding opportunities
- Veterinarians are great to work with
- Pets don't have insurance
- Rewarding financially and personally
- The media loves it!
- Pets and pet owners need it!
- You get to use your imagination
- You'll be the hit of the party with your pet tales!
- It's FUN!!!



## Common Veterinary Rx's

Potassium Bromide

Phenobarbital

Fluoxetine

Methimazole

Glipizide

Cisapride

Diethylstilbestrol (DES)

Cyclosporine (A)

Ivermectin

Thank You and Good Luck!

Any Questions???





## Potassium Bromide

(Capsules/solution)

- **Indication:** Anticonvulsant (adjunctive with phenobarbital)
- **Dosage:**
  - 40-50 mg/kg orally once daily (Dogs and cats)
  - 30-40 mg/kg orally once daily when used with Phenobarbital
  - May require loading dose (Takes ~4 months to reach steady state)
  - Give with food or fatty food (Improves absorption and reduces stomach upset)
- **Toxicity/ ADR:** Initial sedation (~3 weeks)
- **Contraindications:** Feline asthma, renal insufficiency
- **Interactions:**
  - Low chloride diets may increase the risk of ADR and cause toxicity.
  - High chloride diets may reduce medication levels in the body.
  - Diuretics may increase excretion

*Discontinue treatment if cat develops coughing or trouble breathing!*



## Phenobarbital

(Capsules/Fixed oil/Suspension)

- **Indications:** Anticonvulsant, sedative (First-line choice)
- **Dosage:**
  - Dogs: 2-8 mg/kg orally every 12 hours (Half life in dogs ~2 days)
  - Cats: 2-4 mg/kg orally every 12 hours (sedation: 1mg/kg BID)
  - Dosage increased in puppies up to 50% due to increased distribution volume, clearance and decreased half-life
  - If side effects are problematic, use in lower dose in combination with potassium bromide
- **Toxicity/ ADR:**
  - Sedation, increased appetite, thirst, and urination, weight gain, etc
  - If side effects are problematic, use in lower dose and in combination with potassium bromide
- **Contraindications:** Hepatic, respiratory and severe cardiac disease
- **Interactions:**
  - CYP induction (Warfarin, corticosteroids, doxycycline, etc)



## Fluoxetine HCl

(PLO gel)

- **Indication:** Anxiety/agitation, aggression, urine spraying, obsessive compulsive disorder (ie: incessant licking)
- **Dosage:**
  - Dogs: 0.5-1 mg/kg orally daily (10-20 mg orally daily usually)
  - Cats: 0.5-4 mg/kg orally daily OR 5-10 mg/kg transdermally
  - Transdermal bioavailability is ~10% of oral route.
  - Due to long half-life, may take 1-4 weeks for effect
- **Toxicity/ ADR:**
  - Generally well tolerated
  - May cause loss of appetite or anxiety
- **Contraindications:**
  - Animals with liver impairment should be dosed conservatively



## Methimazole

(Suspension, PLO gel)

- **Indication:** Hyperthyroidism
- **Dosage:**
  - Cats: 2.5mg orally bid x 7-14 days, then increase to 5-10mg bid.
  - Maintenance dose: 10-15mg orally once daily
  - Transdermal dose is comparable to oral dose, although higher dose may be needed to reach target T4 concentration.
  - Transdermal absorption is less consistent, and may require more frequent attention to dose adjustment
- **Toxicity/ ADR:**
  - Appetite loss, vomiting (minimized in transdermal route)
  - Decreased serum platelet concentration (abnormal bleeding)
  - No differences in occurrence rates of decreased white blood cell count or liver toxicity between oral and transdermal routes
- **Contraindications:**
  - Abnormal bleeding or low platelet count



## Glipizide

(PLO gel)

- **Indication:** Management of diabetes in cats (Efficacy in dogs undetermined)
- **Dosage:**
  - Cats: 2.5-7.5mg orally daily
  - Transdermal absorption shown to be  $20 \pm 14\%$  of oral absorption
  - Transdermal absorption was slower (mean maximum glipizide concentration was reached  $5.0 \pm 3.5$  hours after oral and  $16.0 \pm 4.5$  hours after transdermal administration)
  - Half-life was similar (15-17 hours)
- **Toxicity/ ADR:**
  - Hypoglycemia (high fiber diets will minimize)
  - Vomiting (transient)
  - Liver enzyme elevations

*Insulin may be necessary only 40% of cats are responsive to glipizide.*



## Cisapride

(Suspension)

- **Indications:** Regurgitation, constipation, decreased GI motility
- **Dosage:**
  - Dogs: 0.1 -1 mg/kg orally 2-3 times daily
  - Cats: 2.5-5 mg orally 2-3 times daily (max of 1mg/kg po TID)
- **Toxicity/ ADR:** Diarrhea, stomach ache
- **Contraindications:**
  - Pregnancy
  - GI obstruction or GI bleed.
  - Avoid or reduce dose in animals with hepatic impairment
  - **NOT approved for use in humans** due to risk of drug interactions (CYP 450 3A4) and heart arrhythmias (QT prolongation).
- **Interactions:**
  - Increased Effect – Benzodiazepines, Ketoconazole, Itraconazole, Miconazole, Troleandomycin, Cimetidine?
  - Decreased Effect - Anticholinergics

*Good option if unpleasant side effects with metoclopramide (ie: sedation)*



## Diethylstilbestrol

(Tablet/ Capsule)

- **Indication:** Urinary incontinence in spayed female dogs
- **Dosage:**
  - Dogs: 0.1-1 mg orally daily
  - Cats: 0.05-0.1 mg orally daily
  - Duration: once daily for 5 days, then once every 4-7 days as needed
- **Toxicity/ ADR:**
  - Rare - bone marrow suppression, low red blood cell count, white cell count, and/or platelet count may occur at higher doses.
  - Cats: May cause liver, heart, or pancreas problems if taken long term
- **Contraindication:**
  - Pregnancy
  - **Carcinogenic in humans** - Use gloves when handling!
- **Interactions:**
  - Phenobarbital, phenylbutazone, and rifampin can induce metabolism of DES, resulting in decreased concentration and efficacy.

*At doses of 1mg, DES is not carcinogenic in animals!*



## Cyclosporine (A)

(1-2% ophthalmic suspension/ 0.1 - 0.2% ophthalmic ointment)

- **Indication:** KCS (keratoconjunctivitis sicca) “dry eye”
  - Severe decrease in tear production
  - May cause blindness if left untreated
  - Cause:
    - Genetic predisposition: bloodhounds, terriers, bulldogs, cocker spaniels, and most toy breeds
    - Viral infection, inflammation, immune-related disease
- **Dosage:**
  - Dogs and cats: Apply twice daily (lifetime medication)
  - Dogs unresponsive to the ointment, may respond to the suspension
- **Contraindicated:**
  - Eye ulcers or lacerations whose healing would be impaired

*Owner must wear protective gloves when administering to pet*



## Ivermectin (Solution)

- **Indication:** Anti-parasitic
  - Intestinal parasites
  - Mites
  - Microfilaria
  - Larvae
- **Dosage:** Horses: 0.2 mg/kg (single dose)
- **Toxicity/ ADR:**
  - Generally safe
  - Symptoms include: depression, immobility, sight impairment, coma, death
- **Contraindications:** <6 weeks old
- **Heartguard:** Commercially available product (low dose) for prevention of heartworms in dogs and cats

## How do you dose animals?



*Morning Edition*, July 25, 2005 · Dead sea lions are turning up on California beaches once more. The culprit is domoic acid, which is present in the algae that the seals ingest while eating fish. The acid has a debilitating effect on the sea lions' nervous system.

Phenobarbital injection

## How do you dose animals?



Gorilla with  
Giardia



Sick Hedgehog



Constipated  
Elephant



Humpback whales injured/stuck  
in California

## How do you dose animals?



Fungal infections for  
rare Red Panda's, or a  
Cockatoo?



Horse that needs  
large doses of  
meds? Or an ill  
snake?

