



Bio-Serv's MD's™ and Medicated Feeds: a stress-free and cost-effective approach to dosing laboratory animals

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Oral dosing of laboratory animals is not only a labor-intensive task for technicians, but is also stressful and potentially hazardous to the animals. Bio-Serv's MD's™ (Medicated Dosing System) and Medicated Feeds product lines offer safe, accurate, and labor-saving alternatives to traditional methods of administering oral or injectable medications and experimental drugs. These diets are available in a wide range of formulas and flavors, and can even be customized to meet specific needs.

Bio-Serv has been producing a successful line of chewable medicated feeds and treats for research animals for more than 10 years. These products, originally formulated by incorporating established medications or experimental compounds into our PRIMA-Treat™ and Dustless Precision Pellet® lines, were first developed for nonhuman primates (NHPs) because of the inherent difficulties and potential dangers encountered when dosing these animals. The MD's line evolved from there into a highly palatable formula with excellent drug-masking capabilities.

Bio-Serv has expanded the MD's and Medicated Feed product lines to include feeds for all species and carries a panoply of medications commonly used in research today.

MD's (Medicated Dosing System)

MD's provide a precise, flexible dosing system for laboratory animals (Fig. 1). Available in sizes ranging from 3-g wafers to 50-g blocks, MD's can be formulated in several different flavors, sizes, drug dosages, and drug combinations. MD's are available in either a grain-based nutritionally complete formula that provides a sole-source medicated diet for smaller laboratory species or in a carbohydrate-based formula that can be used as a 'medicated treat' for larger species. Both formulations provide superior taste-masking qualities that make the treatments readily acceptable to the animals.

MD's are manufactured in a cold-compression process that involves neither heat nor steam, which spares the drug or compound from potential degradation during the tableting process. The powdered base is thoroughly mixed with the medication or experimental drug and compressed into tablets. All MD's wafers are scored for easy dosing options. Bio-Serv currently manufactures an array of Standard MD's for both NHPs and rodents. Custom formulations are also available for all species.

The Standard MD's line for NHPs includes a wide variety of antibiotics, anti-inflammatory compounds, and anti-anxiety agents. (See



FIGURE 1 | Bio-Serv's MD's (Medicated Dosing System) offer a safe and accurate alternative to traditional methods of administering oral or injectable medications and experimental drugs.

Bio-Serv's catalog and website (<http://www.bio-serv.com>) for a complete list.) An MD request (prescription) form must be completed for prescription drugs purchased from Bio-Serv and will remain on file for one year. Refills are permitted during that one-year period provided that the prescribing veterinarian or investigator is still affiliated with the requesting institution.

The Standard MD's available for rodents include SCID MD's™, Helicobacter 3- and 4-Drug Combos (Fig. 2), and Rimadyl® MD's.

SCID MD's. This formulation was developed to reduce the risk of respiratory problems in immunocompromised mice, such as that posed by *Pneumocystis carinii*-induced pneumonia. Each 5-g tablet contains 60 mg of sulfamethoxazole and 10 mg of trimethoprim. Though researchers have used this dose for many years, drug dosages at this level may result in reproductive difficulties. Several institutions have employed pulse therapy treatment protocols, keeping the SCID rodents healthy without compromising reproduction. The diet is a sterile, bacon-flavored,

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ADVERTISING FEATURE



FIGURE 2 | The 4-Drug Combo, invented by Bio-Serv, is the most effective diet currently available for eliminating *Helicobacter* infections. The diet is effective against pathogenic strains, including *H. bilis* and *H. hepaticus*.

nutritionally balanced grain-based tablet that animals find highly palatable. Custom concentrations are also available.

Helicobacter MD's. These sterile, 5-g, bacon-flavored, nutritionally balanced grain-based tablets are available in a three-drug combination and a new four-drug combination. The '3-Drug Combo' has been the standard for years and has proven efficacious in treating early or acute infections in weanlings¹. The newer '4-Drug Combo' was invented by Bio-Serv, and field studies demonstrate that the diet, along with excellent husbandry procedures, eradicates pathogenic strains of *Helicobacter*, including *H. bilis* and *H. hepaticus*² (results are based on the use of Bio-Serv's formula). The 4-Drug Combo is the most effective diet currently available for eliminating *Helicobacter* infections.

Rimadyl MD's. These tablets were developed as a way to easily administer well-accepted non-steroidal anti-inflammatory drugs to rodents and NHPs. Pain or discomfort as a result of postoperative procedures, research protocols, arthritis, or other inflammatory conditions is an important variable to control. Pain management in chronic or acute conditions decreases stress and enhances the healing process. The Rimadyl MD's for rodents are dosed at 2 mg/5 g MD tab and are a bacon-flavored, nutritionally complete tablet. The Rimadyl MD's for primates are dosed at 15 mg/5 g MD tab and are a cherry-flavored treat. Custom Rimadyl MD's are available for other laboratory animal species.

Medicated Feeds

Bio-Serv's Medicated Feeds are manufactured using a grain-based diet and come in standard half-inch pellets. Heat is kept to a minimum during the pelleting process, preventing damage to the medication(s) or compound(s). Standard Medicated Feeds for rodents include the 'Fenbendazole Diet' and 'Doxycycline Diet'.



FIGURE 3 | The Doxycycline Diet is a nutritionally complete grain-based diet used to turn transgenes on and off in genetically modified rodents. The light green color allows it to be easily distinguished from nonmedicated rodent diet.

Fenbendazole Diet. This product has been reliably used as a safe and effective method for eradicating pinworms in rodents. The medicated diet contains the widely accepted dose of 150 mg of fenbendazole per kg of diet (150 p.p.m.). The standard treatment plan is to administer the medicated feed using a pulse therapy approach (one week on medicated diet and one week on regular rodent diet) for nine weeks total³. The highly palatable diet is sterile and made from a nutritionally complete grain-based rodent diet.

Doxycycline Diet. The 'Dox Diet' (Fig. 3) is a nutritionally complete grain-based diet used as an effective tool for turning on and off transgenes in genetically modified rodents. Doxycycline is a light-sensitive drug, and therefore incorporating it into a diet makes the drug more stable than if it were administered via water. Dox Diet also reduces the risk of animal dehydration as compared to other administration methods and eliminates the need to prepare labor-intensive medicated water bottles. The diet is sterile and colored light green for easy identification.

Company profile

With over 35 years experience, Bio-Serv can help customers achieve their treatment goals. The well-trained professional staff including a PhD nutritionist and veterinarian is available full-time and are prepared to help develop a nonstressful treatment plan for any laboratory animal species.

1. Kerton, A.J. & Warden, P. Review of successful treatment for *Helicobacter* spp. in laboratory mice. *LAVA Briefings* 7(2), 17–22 (2004).
2. Jury, J., Gee, L.C., Delaney, K.H., Perdue, M.H. & Bonner, R.A. Eradication of *Helicobacter* spp. from a rat breeding colony. *Contemp. Top. Lab. Anim. Sci.* 44(4), 8–11 (2005).
3. Hill, W.A. et al. Efficacy and safety of topical selamectin to eradicate pinworm (*Syphacia* spp.) infections in rats (*Rattus norvegicus*) and mice (*Mus musculus*). *J. Am. Assoc. Lab. Anim. Sci.* 44(3), 23–26 (2006).

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