



# FDA-APPROVED INJECTABLE BEEF CATTLE ANTIMICROBIALS

Several antimicrobial products are available to beef producers for treating bacterial and diseases that infect livestock. Some products require a daily dose to produce an antimicrobial effect. Others are long acting, providing multiple days of therapeutic effect from a single injection.

The amount needed to treat a specific condition varies by product. Doses are measured in volume per unit of animal body weight, so the ability to determine or at least estimate the animal's body weight is critical. The volume per injection site of 10cc should not be exceeded to prevent injection site irritation, possible lesions, and extended withdrawal times. Most syringes measure capacity in cubic centimeters. When preparing injections, keep in mind that 1 cubic centimeter (cc) is equal to 1 milliliter (mL).

There are three injection methods: intravenous (into a vein, IV), intramuscular (into a muscle, IM), or subcutaneous (under the skin, SC). Some products can be administered in a variety of ways, but others are approved for only one method. Follow Beef Quality Assurance (BQA)<sup>1</sup> guidelines and use the subcutaneous (SC) route of injection when it is an approved route.

The dosing regimen should be listed on the bottle or package insert. Follow the listed regimen for optimal effectiveness in treating diseases for which the product is approved. Some products were previously marketed as over-the-counter products but have transitioned to require a veterinary prescription (Rx) for use.

For antimicrobials approved for use in beef cattle, there is a period of time required between the last treatment and the earliest time treated cattle can be sold for slaughter for human consumption. This withdrawal period, normally listed in days, is based on scientific research and mandated by the Food and Drug Administration (FDA). Failure to observe withdrawal times could result in illegal residues remaining in the meat when the animal is harvested.

Withdrawal times are meaningful only when the product is used according to label directions, i.e., proper dose, proper route of administration, and proper volume per injection site.

Withdrawal periods are designed to protect consumers. The table on page 2 contains the following:

- Common retail product names of antimicrobial-products approved for use in beef cattle. Products grouped by active drug in the pioneer (original) product followed by bioequivalent product.
- Dose in milliliters (cc) required per 100 pounds of animal body weight.
- FDA-approved route(s) of administration.
- FDA-approved treatment regimen for product.
- FDA-approval for bovine respiratory disease (BRD) control.
- FDA-approved indications.
- Required withdrawal time in days.
- Whether the product requires a veterinary prescription.

None of the antimicrobials listed in the table are effective for treating viral infections.

**Warning:** Information provided in the table was current as of June 2024, and should serve as a general guideline. The list is subject to change as the FDA modifies requirements or manufacturers develop new product information. Always read the product label or package insert or consult your veterinarian before use to ensure that important information regarding the product has not changed since publication.

1 Beef Quality Assurance guidelines can be found at: <https://www.bqa.org>

**Table:** FDA-Approved Injectable Beef Cattle Antimicrobials

Type	Product Name	mL/100 lb	Route <sup>1</sup>	Doses Required	Indications <sup>2</sup>	BRD Control	Withdrawal (days)	Rx <sup>3</sup>	
Long Acting Treatment	Advocin	Single dose	2	SC	1	BRD <sup>4</sup>		4	x
		Multidose	1.5	SC	2, 48 hrs apart	BRD <sup>4</sup>	Yes	4	x
	Baytril 100, Enroflox 100, Enrofloxacin 100, Enromed 100, Quellaxcin, Tenotryl 100		3.4-5.7	SC	1	BRD <sup>4</sup>	Yes (3.4mL/100lbs)	28	x
	Combi-Pen-48 (Penicillin G Benzathine and Penicillin G Procaine)		1.33	SC	1	BRD <sup>4</sup> , Rhinitis, pharyngitis, Blackleg		30	x
	Draxxin (Arovyn, Increxxa, Macrosyn, Respiramycin, Tulaven, Tulieve, Tulissin, Vacasan)		1.1	SC	1	BRD <sup>4</sup> , IBK, Foot-rot,	Yes	18	x
	Draxxin KP		1.1	SC	1	BRD <sup>4</sup> , Pyrexia		18	x
	Excede		1.5	SC Base of ear	1	BRD <sup>4</sup> , Foot-rot, metritis	Yes	13	x
	Excenel RTU EZ		2	SC, IM	2, 48 hrs apart	BRD <sup>4</sup>		4	x
	Excenel RTU (Cefenil RTU)		2	SC, IM	2, 48 hrs apart	BRD <sup>4</sup> , Foot-rot, metritis		3	x
	Hexasol		4.5	SC, IM	1	BRD <sup>4</sup> , Fever		21	x
	Micotil 300		1.5-3	SC	1	BRD <sup>4</sup>	Yes	42	x
	Noromycin 300LA		4.5	SC, IM	1	BRD <sup>4</sup> , IBK, Foot-rot, diphtheria, scours, wooden tongue, lepto, metritis, wounds		28	x
	Norfenicol		6	SC	1	BRD <sup>4</sup> , Foot-rot	Yes	33	x
	Nuflor Gold		6	SC	1	BRD <sup>4</sup>		44	x
	Nuflor, Loncor, Florfenicol		6	SC	1	BRD <sup>4</sup> , Foot-rot	Yes	38	x
	Nuflor, Loncor, Florfenicol, Norfenicol		3	IM	2, 48 hrs apart	BRD <sup>4</sup> , Foot-rot		28	x
Oxytetracycline 200: Agrimycin 200, Bio-mycin200, Liquamycin LA-200, Oxytetracycline Injection 200, Terra-Vet 200, Vetrimycin 200		4.5	SC, IM, IV	1	BRD <sup>4</sup> , IBK, Foot-rot, diphtheria, scours, wooden tongue, lepto, metritis, wounds		28	x	

Type	Product Name	mL/100 lb	Route <sup>1</sup>	Doses Required	Indications <sup>2</sup>	BRD Control	Withdrawal (days)	Rx <sup>3</sup>	
<b>Long Acting Treatment</b>	Pradalex	2.3	SC	1	BRD <sup>4</sup>		4	x	
	Resflor Gold	6	SC	1	BRD <sup>4</sup> , Pyrexia		38	x	
	Zactran	1.8	SC	1	BRD <sup>4</sup>	Yes	35	x	
	Zuprevo	1	SC	1	BRD <sup>4</sup>	Yes	21	x	
<b>Daily Treatment</b>	Baytril 100, Enroflox 100, Enrofloxacin 100, Enromed 100, Quellaxcin, Tenotryl 100	1.1-2.3	SC	3 to 5 days	BRD <sup>4</sup>		28	x	
	Excenel RTU EZ	1-2	SC, IM	3 to 5 days	BRD <sup>4</sup> , Foot-rot, metritis		4	x	
	Excenel RTU, Cefenil RTU	1-2	SC, IM	3 to 5 days	BRD <sup>4</sup> , Foot-rot, metritis		3	x	
	Naxcel, Ceftiflex Powder	1-2	SC, IM	3 to 5 days	BRD <sup>4</sup> , foot-rot		4	x	
	Oxytet 100	3-5	IV	Up to 4 days	BRD <sup>4</sup> , IBK, Foot-rot, diphtheria, scours, wooden tongue, leptospirosis, metritis, wounds		22	x	
	Penicillin G procaine	Norocillin, Bactracillin G	1	IM	Up to 4 days	BRD <sup>4</sup>		14	x
		Pen-aqueous, Pro-Pen-G	1	IM	Up to 7 days	BRD <sup>4</sup>		4	x
	Polyflex, Ampicillin	Variable	IM	Up to 7 days	BRD <sup>4</sup>		6	x	
	SpectoGard	4.5-6.8	SC	3 to 5 days	BRD <sup>4</sup>		11	x	
	Tylan 200, Bilovet	4	IM	Up to 5 days	BRD <sup>4</sup> , Foot-rot, diphtheria, metritis		21	x	

1 SC = Subcutaneous IM = Intramuscular IV = Intravenous

2 IBK = Infectious bovine keratoconjunctivitis and BRD = bovine respiratory disease

3 This represents a regulatory change. All medically important products are now under a prescription.

4 Read individual labels for labeled micro-organisms.

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## Research and Extension

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