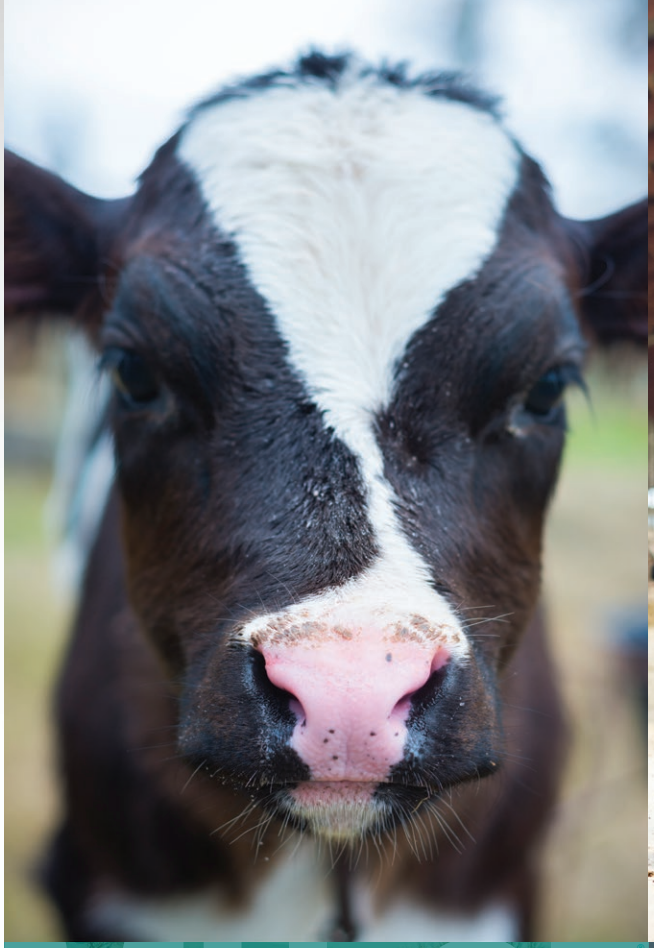

MU-SE® BO-SE®

Giving cattle the selenium they need, when they need it most.

MERCK
Animal Health

Strategic planning can help head off Selenium-Tocopherol Deficiency problems.

Selenium-Tocopherol Deficiency (STD) in breeding and production cows can cause:

- **Stiffness and lameness**
- **Chronic persistent diarrhea**
- **Unthriftiness**
- **Abortions**
- **Weak, premature calves**
- **Significant profit losses**

Which cattle are most at risk from STD?

Cows carrying calves:
Research shows selenium levels drop as cows approach parturition.

Neonates:
Calves dropped by selenium-deficient dams also run greater-than-average risk of STD.

Weanlings:
Weanling stress, new diet, changes in surroundings: all can trigger STD in marginal calves.

Cattle under stress:
Stressed animals generate excess peroxides, which are toxic to cells. The OSH-Px that detoxifies these poisons is often deficient in selenium-marginal animals.

MU-SE and BO-SE are the logical ways to fight STD

MU-SE and BO-SE are known quantities:
You don't have to wonder if cows are getting enough selenium to protect them from STD. You know they are.

MU-SE and BO-SE are timely:
Injections can be given when cattle are most at risk. Assures protection when it's needed most.

MU-SE and BO-SE are programmable:
Injections can be synchronized with other programs such as pregnancy checks and vaccination. You consolidate efforts, save time, command maximum management control.

MU-SE and BO-SE are predictable:
One injection lasts 30 to 45 days. Even if feed is selenium-deficient, you know animals are STD-protected.

MU-SE and BO-SE help improve breeding and reproduction programs:
Allows you to address selenium deficiency in pregnant cows by injection during the middle third of pregnancy and about 30 days pre-calving. Helps assure selenium-adequate dams and better-performing calves.

MU-SE® Sodium Selenite – 10.95 mg (equivalent to 5 mg selenium) – Vitamin E – 50 mg (68 I.U.)

Species	Dosage	Route of Administration	Withholding to Slaughter
Calves (weanling)	1 mL/200 lbs. b.w.	S.Q. or I.M.	30 Days
Cows (breeding beef)	1 mL/200 lbs. b.w. During middle third of pregnancy and 30 days before calving.	S.Q. or I.M.	30 Days

BO-SE® Selenium Selenite – 2.19 mg (equivalent to 1 mg selenium) – Vitamin E – 50 mg (68 I.U.)

Species	Dosage	Route of Administration	Withholding to Slaughter
Calves	2.5-3.75 mL/100 lbs. (depending on severity)	S.Q. or I.M.	30 Days
Lambs (2 weeks of age or older)	1 mL/40 lbs. b.w. (minimum, 1 ml)	S.Q. or I.M.	14 Days
Ewes*	2.5 mL/100 lbs. b.w.	S.Q. or I.M.	14 Days
Sows	1 mL/40 lbs. b.w. (minimum, 1 ml)	S.Q. or I.M.	14 Days
Weanling Pigs	1 mL/40 lbs. b.w. (minimum, 1 ml)	S.Q. or I.M.	14 Days

* Not for use in pregnant ewes

MERCK Animal Health

NADA # 30-314, Approved by FDA.

MU-SE®

(SELENIUM, VITAMIN E)
Injection
FOR VETERINARY USE ONLY

CAUTION Federal law restricts this drug to use by or on the order of a licensed veterinarian.

DIRECTIONS MU-SE (selenium, vitamin E) is an emulsion of selenium-tocopherol for the prevention and treatment of Selenium-Tocopherol Deficiency (STD) syndrome in weanling calves and breeding beef cattle. Each mL contains: 10.95 mg sodium selenite (equivalent to 5 mg selenium), 50 mg (68 USP units) vitamin E (as d-alpha tocopheryl acetate), 250 mg polysorbate 80, 2% benzyl alcohol (preservative), water for injection q.s. Sodium hydroxide and/or hydrochloric acid may be added to adjust pH.

ACTIONS It has been demonstrated that selenium and tocopherol exert physiological effects and that these effects are intertwined with sulfur metabolism. Additionally, tocopherol appears to have a significant role in the oxidation process, thus suggesting an interrelationship between selenium and tocopherol in overcoming sulfur-induced depletion and restoring normal metabolism. Although oral ingestion of adequate amounts of selenium and tocopherol would seemingly restore normal metabolism, it is apparent that the presence of sulfur and, perhaps, other factors interfere during the digestive process with proper utilization of selenium and tocopherol. When selenium and tocopherol are injected, they bypass the digestive process and exert their full metabolic effects promptly on cell metabolism. Anti-inflammatory action has been demonstrated by selenium-tocopherol in the Selye Pouch Technique and experimentally induced polyarthritis study in rats.

INDICATIONS MU-SE (selenium, vitamin E) is recommended for the prevention and treatment of STD syndrome in weanling calves and breeding beef cattle. Clinical signs are: stiffness and lameness; chronic, persistent diarrhea; unthriftiness; abortions and/or weak premature calves.

CONTRAINDICATION Do not use in adult dairy cattle. Premature births and abortions have been reported in dairy cattle injected with this product during the third trimester of pregnancy.

WARNINGS Anaphylactoid reactions, some of which have been fatal, have been reported in cattle administered the MU-SE product. Signs include excitement, sweating, trembling, ataxia, respiratory distress, and cardiac dysfunction.

Use only as directed in weanling calves and breeding beef cows. Discontinue use 30 days before the treated cattle are slaughtered for human consumption.

DOSAGE AND ADMINISTRATION Inject subcutaneously or intramuscularly. Weanling calves: 1 mL per 200 pounds of body weight. Breeding beef cows: 1 mL per 200 pounds of body weight during the middle third of pregnancy, and 30 days before calving.

CAUTION Selenium is toxic if administered in excess. A fixed dose schedule is therefore important (read package insert for each selenium-tocopherol product carefully before using).

PRECAUTIONS Selenium-Tocopherol Deficiency (STD) syndrome produces a variety and complexity of symptoms often interfering with a proper diagnosis. Even in selenium deficient areas there are other disease conditions which produce similar clinical signs. It is imperative that all these conditions be carefully considered prior to treatment of STD syndrome. Serum selenium levels, elevated SGOT, and creatine levels may serve as aids in arriving at a diagnosis of STD, when associated with other indices.

Important Use only the selenium-tocopherol product recommended for each species. Each formulation is designed for the species indicated to produce the maximum efficacy and safety.

HOW SUPPLIED 100 mL sterile, multiple dose vial.

STORAGE Store between 2° and 30°C (36° and 86°F). Protect from freezing.

Made in Germany.
Rev. 03/15
138188 R1
CPN: 1047131.3

BO-SE®

(SELENIUM, VITAMIN E)
Injection
FOR VETERINARY USE ONLY

CAUTION Federal law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION BO-SE (selenium, vitamin E) is an emulsion of selenium-tocopherol for the prevention and treatment of white muscle disease (Selenium-Tocopherol Deficiency) syndrome in calves, lambs, and ewes, and as an aid in the prevention and treatment of Selenium-Tocopherol Deficiency in sows and weanling pigs. Each mL contains: 2.19 mg sodium selenite (equivalent to 1 mg selenium), 50 mg (68 USP units) vitamin E (as d-alpha tocopheryl acetate), 250 mg polysorbate 80, 2% benzyl alcohol (preservative), water for injection q.s. Sodium hydroxide and/or hydrochloric acid may be added to adjust pH.

PHARMACOLOGY It has been demonstrated that selenium and tocopherol exert physiological effects and that these effects are intertwined with sulfur metabolism. Additionally, tocopherol appears to have a significant role in the oxidation process, thus suggesting an interrelationship between selenium and tocopherol in overcoming sulfur-induced depletion and restoring normal metabolism. Although oral ingestion of adequate amounts of selenium and tocopherol would seemingly restore normal metabolism, it is apparent that the presence of sulfur and, perhaps, other factors interfere during the digestive process with proper utilization of selenium and tocopherol. When selenium and tocopherol are injected, they bypass the digestive process and exert their full metabolic effects promptly on cell metabolism. Anti-inflammatory action has been demonstrated by selenium-tocopherol in the Selye Pouch Technique and experimentally induced polyarthritis study in rats.

INDICATIONS BO-SE (selenium, vitamin E) is recommended for the prevention and treatment of white muscle disease (Selenium-Tocopherol Deficiency) syndrome in calves, lambs, and ewes. Clinical signs are: stiffness and lameness, diarrhea and unthriftiness, pulmonary distress and/or cardiac arrest. In sows and weanling pigs, as an aid in the prevention and treatment of diseases associated with Selenium-Tocopherol deficiency, such as hepatic necrosis, mulberry heart disease, and white muscle disease. Where known deficiencies of selenium and/or vitamin E exist, it is advisable, from the prevention and control standpoint, to inject the sow during the last week of pregnancy.

CONTRAINDICATIONS DO NOT USE IN PREGNANT EWES. Deaths and abortions have been reported in pregnant ewes injected with this product.

WARNINGS Anaphylactoid reactions, some of which have been fatal, have been reported in animals administered BO-SE Injection. Signs include excitement, sweating, trembling, ataxia, respiratory distress, and cardiac dysfunction.

Discontinue use 30 days before the treated calves are slaughtered for human consumption. Discontinue use 14 days before the treated lambs, ewes, sows, and pigs are slaughtered for human consumption. Selenium-Vitamin E preparations can be toxic when improperly administered.

PRECAUTIONS Selenium-Tocopherol Deficiency (STD) syndrome produces a variety and complexity of symptoms often interfering with a proper diagnosis. Even in selenium deficient areas there are other disease conditions which produce similar clinical signs. It is imperative that all these conditions be carefully considered prior to treatment of STD syndrome. Serum selenium levels, elevated SGOT, and creatine levels may serve as aids in arriving at a diagnosis of STD, when associated with other indices. Selenium is toxic if administered in excess. A fixed dose schedule is therefore important (read package insert for each selenium-tocopherol product carefully before using).

Important Use only the selenium-tocopherol product recommended for each species. Each formulation is designed for the species indicated to produce the maximum efficacy and safety.

ADVERSE REACTIONS Reactions, including acute respiratory distress, frothing from the nose and mouth, bloating, severe depression, abortions, and deaths have occurred in pregnant ewes. No known treatment exists because at this time the cause of the reaction is unknown.

DOSAGE AND ADMINISTRATION Inject subcutaneously or intramuscularly. Calves: 2.5-3.75 mL per 100 pounds of body weight depending on the severity of the condition and the geographical area. Lambs 2 weeks of age and older: 1 mL per 40 pounds of body weight (minimum, 1 mL). Ewes: 2.5 mL per 100 pounds of body weight. Sows: 1 mL per 40 pounds of body weight. Weanling pigs: 1 mL per 40 pounds of body weight (minimum, 1 mL). Not for use in newborn pigs.

STORAGE Store between 2° and 30°C (36° and 86°F). Protect from freezing.

HOW SUPPLIED 100 mL sterile, multiple dose vial, NDC 0061-0807-05.
NADA #12-635, Approved by FDA.
October 1998

Made in Germany.
141329 R1
CPN: 1047025.3

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