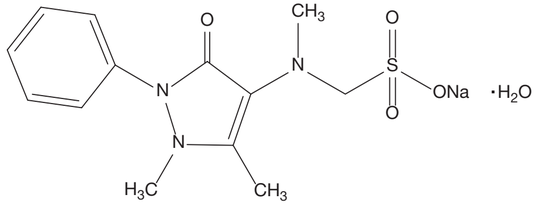
Zimeta®
(dipyrone injection)

500 mg/mL injection
For intravenous use in horses
Non-steroidal anti-inflammatory drug (NSAID)

CAUTION: Federal law (U.S.A.) restricts this drug to use by or on the order of a licensed veterinarian.

Description: Dipyrone belongs to the pyrazolone class of non-steroidal anti-inflammatory (NSAID) drugs. Chemically, dipyrone is metamizole sodium. Each mL of this clear sterile solution for intravenous injection contains 500 mg dipyrone and 10 mg benzyl alcohol in water.

The structural formula of dipyrone is:



Molecular Formula: $C_{13}H_{16}N_3NaO_4S \cdot H_2O$ Molecular Weight: 351.4

Indication: Zimeta® (dipyroine injection) is indicated for the control of pyrexia in horses.

Dosage and Administration: Always provide the Client Information Sheet with the prescription. Administer Zimeta by intravenous injection, once or twice daily, at 12 hour intervals, for up to three days, at a dosage of 30 mg/kg (13.6 mg/lb). The overall number of doses and duration of treatment with Zimeta is dependent on the response observed (fever reduction). Zimeta may be re-administered based on recurrence of fever for up to 3 days. Zimeta is provided in a multi-dose vial and contains a preservative.

Contraindications: Horses with hypersensitivity to dipyrone should not receive Zimeta. Due to the prolongation of prothrombin time (PT) and associated clinical signs of coagulopathy, dipyrone should not be given more frequently than every 12 hours.

Warnings: For use in horses only. Do not use in horses intended for human consumption. Do not use in any food producing animals, including lactating dairy animals.

Human Warnings: Care should be taken to ensure that dipyrone is not accidentally injected into humans as studies have indicated that dipyrone can cause agranulocytosis in humans.

Not for use in humans. Keep this and all drugs out of reach of children. In case of accidental exposure, contact a physician immediately. Direct contact with the skin should be avoided. If contact occurs, the skin should be washed immediately with soap and water. As with all injectable drugs causing profound physiological effects, routine precautions should be employed by practitioners when handling and using loaded syringes to prevent accidental self-injection.

Precautions: Horses should undergo a thorough history and physical examination before initiation of any NSAID therapy.

As a class, NSAIDs may be associated with platelet dysfunction and coagulopathy. Zimeta has been shown to cause prolongation of coagulation parameters in horses. Therefore, horses on Zimeta should be monitored for clinical signs of coagulopathy. Caution should be used in horses at risk for hemorrhage.

As a class, NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Consider stopping therapy if adverse reactions, such as prolonged inappetence or abnormal feces, could be attributed to gastrointestinal toxicity. Patients at greatest risk for adverse events are those that are dehydrated, on diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached or avoided. Since many NSAIDs possess the potential to produce gastrointestinal ulcerations and/or gastrointestinal perforation, concomitant use of Zimeta with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. The influence of concomitant drugs that may inhibit the metabolism of Zimeta has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy.

The safe use of Zimeta in horses less than three years of age, horses used for breeding, or in pregnant or lactating mares has not been evaluated. Consider appropriate washout times when switching from one NSAID to another NSAID or a corticosteroid.

Adverse Reactions: Adverse reactions reported in a controlled field study of 138 horses of various breeds, ranging in age from 1 to 32 years of age, treated with Zimeta (n=107) or control product (n=31) are summarized in Table 1. The control product was a vehicle control (solution minus dipyrone) with additional ingredients added to maintain masking during administration.

Horses may have experienced more than one of the observed adverse reactions during the field study. Horses may have received one or more doses of Zimeta during the field study. The control product was only administered once.

Table 1: Adverse Reactions Reported During the Field Study with Zimeta

Adverse Reaction	Zimeta® (dipyrone injection) (N=107)	Control Product (N=31)
Elevated Serum Sorbitol Dehydrogenase (SDH)	5 (5%)	5 (16%)
Hypoalbuminemia	3 (3%)	1 (3%)
Gastric Ulcers	2 (2%)	0 (0%)
Hyperemic Mucosa Right Dorsal Colon	1 (1%)	0 (0%)
Prolonged Activated Partial Thromboplastin Time (APTT)	1 (1%)	0 (0%)
Elevated Creatinine	1 (1%)	0 (0%)
Injection Site Reaction	1 (1%)	0 (0%)
Anorexia	1 (1%)	1 (3%)

Horses with elevated SDH, hypoalbuminemia, prolonged APTT, or elevated creatinine did not show associated clinical signs. One horse exhibited an exacerbation of pre-existing hypoalbuminemia after treatment; this horse also showed concurrent elevation in SDH. Two horses that received Zimeta were diagnosed with gastric ulcers. One horse that received 4 doses of Zimeta was diagnosed with grade III/IV gastric ulceration and hyperemia of the mucosa of the right dorsal colon on post-mortem examination which was performed following euthanasia due to illness unrelated to treatment (septic arthritis and cellulitis). This horse was previously treated with a different NSAID prior to enrollment in the study. A second horse that enrolled in the study due to a mandibular facial wound, and received two doses of Zimeta, was diagnosed with grade III/IV gastric ulcers 4 days following completion of the field study.

In the field study, Zimeta was used concomitantly with other therapies, including antibiotics and sedatives.

Information for Owners or Person Treating Horse: A Client Information Sheet should be provided to the person treating the horse. Treatment administrators and caretakers should be aware of the potential for adverse reactions and the clinical signs associated with NSAID intolerance. Adverse reactions may include colic, diarrhea, and decreased appetite. Serious adverse reactions can occur without warning and, in some situations, result in death. Clients should be advised to discontinue NSAID therapy and contact their veterinarian immediately if any signs of intolerance are observed.

Clinical Pharmacology: Dipyrone is a water soluble pyrazolone derivative that functions as a pro-drug and is immediately hydrolyzed to 4-methlyaminoantipyrine (4-MAA) following administration by any route.[1] In most species, including the horse, 4-MAA is the molecule assayed for pharmacokinetics, as dipyrone is present for an extremely short period of time.[2] In humans, 4-MAA is further metabolized by the liver to secondary metabolites that primarily undergo renal excretion. 4-MAA is also the molecule associated with clinical efficacy in humans. The mechanism of action to reduce pyrexia has not been fully characterized.

Zimeta®
(dipyrone injection)

Non-steroidal anti-inflammatory drug for intravenous use in horses only.

INFORMATION FOR HORSE OWNERS:

Indication: Zimeta® (dipyrone injection) is administered once or twice daily for up to 3 days for the control of pyrexia in horses. The overall duration of treatment with Zimeta (dipyrone injection) will be dependent on the response observed (fever reduction), but should not exceed 3 days. Zimeta should not be administered more frequently than every 12 hours.

This summary contains important information about Zimeta. You should read this information before Zimeta is administered to your horse. This sheet is provided only as a summary and does not take the place of instructions from your veterinarian. Talk to your veterinarian if you do not understand any of this information or you want to know more about Zimeta.

WHAT IS ZIMETA?
Zimeta is a non-narcotic, non-steroidal anti-inflammatory drug (NSAID) of the pyrazolone class used to control fever in horses by veterinary prescription only. Fever is an elevation in body temperature due to a variety of infectious and inflammatory conditions in the horse.

HOW TO GIVE ZIMETA TO YOUR HORSE
Zimeta should be given according to your veterinarian's instructions. Do not change the way you give Zimeta to your horse without first speaking with your veterinarian.

WHAT KIND OF RESULTS CAN I EXPECT WHEN MY HORSE IS BEING TREATED WITH ZIMETA FOR A FEVER?
Zimeta can control fever that is a result of infection or inflammation; however, it is not a cure for the underlying disease. Consult your veterinarian to identify the underlying cause of your horse's elevated body temperature. Response to Zimeta varies from horse to horse.

WHICH HORSES SHOULD NOT RECEIVE ZIMETA?
Your horse should not be given Zimeta if he/she:
- Has an allergic reaction to dipyrone, the active ingredient in Zimeta
- Has previously had an allergic reaction to other NSAIDs
- Is presently taking other NSAIDS or corticosteroids including but not limited to aspirin, phenylbutazone, flunixin meglumine, diclofenac, ketoprofen, firocoxib
- The safety of Zimeta has not been determined in horses less than three years of age or in breeding horses, pregnant or lactating mares

ZIMETA SHOULD BE GIVEN INTRAVENOUSLY TO HORSES ONLY
Zimeta is not for use in horses intended for human food consumption. Do not use in any food producing animals, including lactating dairy animals. People should not take Zimeta. Keep Zimeta and all medications out of the reach of children. Consult a physician in case of accidental ingestion by humans or accidental injection into humans.

WHAT TO TELL/ASK YOUR VETERINARIAN BEFORE GIVING ZIMETA
Talk to your veterinarian about:
- The signs of infection or inflammation you have observed in your horse, such as nasal discharge or coughing
- If any tests, such as bloodwork, will be done before Zimeta is prescribed
- How often your horse may need to be examined by your veterinarian
- The risks and benefits of using Zimeta
- Other medical problems or allergies that your horse has now, or has had in the past
- All medications that you are giving or plan to give to your horse, including those you can get without a prescription and any dietary supplements
- Any recent surgeries

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Tell your veterinarian if your horse has ever had the following medical problems:
- Any side effects from taking Zimeta® (dipyrone injection) or other NSAIDs
- Any increased drinking, increased urination, or known kidney disease
- Any known liver disease
- Any known stomach or gastrointestinal ulcers

Tell your veterinarian if you plan to breed your horse, or if your mare is pregnant or nursing a foal.

WHAT ARE THE POSSIBLE SIDE EFFECTS THAT MAY OCCUR IN MY HORSE DURING ZIMETA THERAPY?

Zimeta, like other NSAIDs, may cause some side effects in individual horses. Serious side effects associated with NSAID therapy can occur with or without warning. Look for the following side effects that may indicate your horse is having a problem with Zimeta or may have another medical problem:
- Change in eating or drinking habits (frequency or amount consumed)
- Change in urination
- Unexpected weight loss
- Change in behavior, such as depression
- Change in manure, such as diarrhea
- Unexplained bleeding

It is important to stop therapy and contact your veterinarian if you think your horse has a medical problem or side effect while taking Zimeta. If you have additional questions about possible side effects, talk with your veterinarian or call Dechra Veterinary Products at 1-866-933-2472.

CAN ZIMETA BE GIVEN WITH OTHER MEDICATIONS?

Zimeta should not be given at the same time as with other NSAIDS (for example, aspirin, phenylbutazone, diclofenac, ketoprofen, flunixin, or firocoxib) or systemic corticosteroids (for example, prednisolone, dexamethasone, or triamcinolone).

WHAT DO I DO IN CASE MY HORSE RECEIVES MORE THAN THE PRESCRIBED AMOUNT OF ZIMETA?

Consult your veterinarian if your horse receives more than the prescribed amount of Zimeta.

WHAT ELSE SHOULD I KNOW ABOUT ZIMETA?

This sheet provides a summary of information about Zimeta (dipyrone injection) and general information about NSAIDs. If you have any questions or concerns about Zimeta or fever talk with your veterinarian.

As with all prescribed medicines, Zimeta should only be given to the horse for which it is prescribed. It should be given to your horse only for the condition for which it is prescribed, at the prescribed dose and duration.

It is important to periodically discuss your horse's response to Zimeta with your veterinarian. Your veterinarian will determine if your horse is responding as expected and if your horse should continue receiving Zimeta.

Manufactured for:
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Approved by FDA under NADA # 141-513

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The mean (± SD) 4-MAA pharmacokinetic parameters after a single intravenous dose of 30 mg/kg dipyrone administered every 12 hours for 9 days to 6 adult horses were as follows: maximum concentration (C_{max}) of 40,616.67 (9,917.34) ng/mL, area under the concentration vs time curve for the dosing interval (AUC_{tau}) of 106,848.75 (12,128.88) hr*ng/mL, volume of distribution (V_z) of 1,607.43 (165.51) mL/kg, clearance at steady state (CL_{ss}) of 284.17 (36.08) mL/kg/hr, and half-life of 3.94 (0.44) hours.

Effectiveness: One hundred and thirty-eight (138) horses were enrolled in a field effectiveness study. The field study was divided into two phases; an effectiveness phase and an extended use field safety phase.

The effectiveness phase was a randomized, masked, controlled, multicenter, field study conducted to evaluate the effectiveness of Zimeta® (dipyrone injection) administered intravenously at 30 mg/kg bodyweight in horses over one year of age with naturally occurring fevers. Enrolled horses had a rectal temperature ≥102.0°F. A horse was considered a treatment success if 6 hours following a single dose of study drug administration the rectal temperature decreased ≥2.0°F from hour 0, or the temperature decreased to normal (≤101.0°F).

One hundred and thirty-eight horses received treatment (104 Zimeta and 34 control product) and 137 horses (103 Zimeta and 34 control product) were included in the statistical analysis for effectiveness. At 6 hours post-treatment, the success rate was 74.8% (77/103) of Zimeta treated horses and 20.6% (7/34) of control horses. The results of the field study demonstrate that Zimeta administered at 30 mg/kg intravenously was effective for the control of pyrexia 6 hours following treatment administration.

The extended use field safety phase was an open-label field study to evaluate the safety of Zimeta when administered intravenously at 30 mg/kg bodyweight to horses with pyrexia under field conditions. Eighty-seven horses from the first phase entered this phase. During the extended use field safety phase, horses may have received more than one dose of Zimeta. Most horses in the study were treated with Zimeta once per day. No horses were treated with Zimeta more than twice daily.

Animal Safety: A pilot laboratory study was conducted in 31 adult horses, ages 3 years to 20 years, with naturally occurring fever (due to respiratory disease or other infectious process) to evaluate the effectiveness of a non-final market formulation of dipyrone injection at a dose of 30 mg/kg intravenously. One horse developed soft feces after treatment with one dose of dipyrone injection and a second horse developed bloody nasal discharge and died one day after receiving one dose of dipyrone injection. Necropsy findings for the horse that died documented severe pleuropneumonia; however, due to the potential effects of dipyrone on platelet aggregation and function, the occurrence of bloody nasal discharge and progression of disease in this horse may be related to treatment. There were no substantive differences between the non-final market formulation used in this pilot study and Zimeta.

A laboratory safety study was conducted in which Zimeta was administered via intravenous catheter to 32 healthy adult horses at 0, 30, 60, and 90 mg/kg (0, 1, 2, and 3X the recommended dose) three times a day (TID), every 8 hours, for 9 consecutive days. Horses in the control group were administered placebo (saline).

The most common post-treatment observations were cough, depression, tachypnea or dyspnea, epistaxis, nasal discharge, inappetence, loose manure, colic and fever. Many of these clinical signs were associated with infectious respiratory disease, which affected horses in all treatment groups. One horse in the 3X group died. This horse had pleuropneumonia and observations of epistaxis for 46 hours with increasing dyspnea prior to spontaneous death, and associated prolongations in both prothrombin time (PT) and activated partial thromboplastin time (APTT). Another horse in the 3X group had nasal discharge with epistaxis that resolved prior to study completion, with associated prolongations in both PT and APTT on Day 8. This horse also had clinical signs and necropsy findings consistent with pneumonia and coagulopathy including: hemorrhage from previous catheter site, renal abscessation with hemorrhage, and petechial and ecchymotic hemorrhage of the ileum. Overall, PT was statistically significantly prolonged for the horses in the 2X and 3X dose groups when compared to control horses (p=0.0037).

Other treatment-related effects included an increase in liver weight and an elevation in total bilirubin. These findings were not associated with clinical signs or liver pathology. On necropsy, duodenal erosion was present in one 3X TID horse. Stomach (non-glandular) erosions were present in one control horse and two 1X TID horses. Stomach (non-glandular) ulcers were present in one control horse and one 2X TID horse. No erosions or ulcerations were identified in the large intestine. On histopathology, there were three 1X TID horses, two 2X TID horses, and three 3X TID horses with minimal or mild renal tubular dilation. One 1X TID horse and two 3X TID horses had minimal renal tubular mineralization. These histopathology changes were not associated with changes on gross necropsy, in clinical pathology or clinical signs of renal dysfunction.

Due to the prolongation of PT and associated clinical signs of coagulopathy, this study did not demonstrate an adequate margin of safety when Zimeta was administered IV three times daily (every 8 hours).

To further evaluate the effects of Zimeta on coagulation, an additional laboratory study was conducted. Zimeta was administered via intravenous catheter to 32 healthy adult horses at 0, 30, 60, and 90 mg/kg (0, 1, 2, and 3X the recommended dose) every 12 hours (BID) for 9 consecutive days, and at 30 and 60 mg/kg (1X and 2X the recommended dose) TID for 9 consecutive days. Horses in the control group were administered placebo (saline). The most common treatment-related adverse effects were anorexia, depression, and loose feces. Seven horses in Zimeta treatment groups experienced one or more of these adverse effects, as compared to no horses in the control group. One horse in the 2X TID group had varying degrees of depression, loose feces and colic for multiple days during the study, which resolved with hand walking.

At the completion of the study, horses were healthy when returned to the source herd. There was an upward numerical trend in the PT which suggested a treatment effect of dipyrone injection on prolongation of PT; however, the overall treatment effect was not significant (p=0.1131). There was no evidence of clinical signs related to coagulopathy. This study supported the conclusion that there is an adequate margin of safety when Zimeta is administered at 30 mg/kg IV twice daily (every 12 hours) for three days.

For pharmacokinetic results see summary in Clinical Pharmacology section.

Storage Information: Store at Controlled Room Temperature between 20° and 25°C (68° and 77°F); with excursions permitted between 15° and 30°C (59° and 86°F). Protect from light. Multi-dose vial. Use within 30 days of first puncture.

How Supplied: Zimeta is available as a 500 mg/mL solution in a 100 mL, multi-dose vial.

Approved by FDA under NADA # 141-513
NDC 17033-905-10

Manufactured for:
Dechra Veterinary Products
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Overland Park, KS 66211 USA

For a copy of the Safety Data Sheet (SDS) or to report adverse reactions call Dechra Veterinary Products at 1-866-933-2472.

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[1]Levy M, Zylber-Katz E, Rosenkranz B. Clinical Pharmacokinetics of Dipyrone and its Metabolites. Clin Pharmacokinet. 1995; 28(3):216-231.

[2]Metamizole Summary Report. Committee for Veterinary Medicinal Products: The European Agency for the Evaluation of Medicinal Products. June 2003. EMA/MRL/878/03-Final

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