Masti Veyxym®
Mastitis ointment without antibiotics with proteolytic enzymes

- Increases local resistance
- Breaks down the products of inflammation and necrosis
- Inhibits pathogen growth
- Reduces virulence
Masti Veyxym® Mastitis-ointment without antibiotics
Ointment for intramammary use in cattle

Active substances and other ingredients
10 g ointment contain:
Active substances:
Alpha-tocopherol acetate 120.00 mg
Retinol palmitate 58.83 mg (equivalent to 100,000 IU)
Chymotrypsin 2,400 FIP-U
Trypsin 240 FIP-U
Papain 6 FIP-U

Indications
Treatment of non-infectious mastitis.
Supportive therapy for infectious acute, chronic and subclinical mastitides in combination with antibiotics based on an antibiogram.
Contraindications
None

Adverse reactions
Enzyme containing preparations frequently cause more or less distinct udder swelling, especially if inserted into the udder. They are to be considered as a strong reaction of the tissue that will disappear again after several days. If you notice any serious effects or other effects not mentioned in this leaflet, please inform your veterinary surgeon or pharmacist.

Target species
Cattle

Dosage for each species, routes and method of administration
For intramammary application
1 injector (with 10 g ointment) for each infected quarter of the udder.
After thoroughly milking out completely followed by thoroughly cleaning and disinfecting of the teats and teat tips, introduce the contents of 1 udder injector into each infected udder quarter.
1 – 3 applications at 12 hour intervals.

Advice on correct administration
None.

Withdrawal period
Cattle:   Meat and offal   Zero days
         Milk               1 day

Special storage precautions
Do not store above 25 °C.
Keep out of the reach and sight of children.
Do not use after the expiry date which is stated on the label and the outer carton.

Special warnings
Special warnings for each target species:
None.

Special precautions for use:
Special precautions for use in animals:
Not applicable.

Special precautions to be taken by the person administering the veterinary medicinal product to animals:
Not applicable.
Use during pregnancy, lactation or lay:
Not applicable.
Interaction with other medicinal products and other forms of interaction:
None known.
Overdose (symptoms, emergency procedures, antidotes), if necessary:
Not applicable.
Incompatibilities:
Not applicable.

Special precautions for the disposal of unused product or waste materials, if any:
Any unused medicinal product or waste material should be disposed of in accordance with local requirements. Ask your veterinary surgeon how to dispose of medicines no longer required.

To be supplied only on veterinary prescription.

Package sizes
10 udder injectors with 10 g ointment each

Please read the package leaflet before using the veterinary medicinal product!

It has been proven in wide ranging investigations in cows that Masti Veyxym® has a high level of efficacy against mastitis. The preparation contains the proteolytic enzymes Trypsin, Chymotrypsin and Papain. This combination proved to be practicable, within the framework of in-vitro studies with udder pathogenic organisms, as the three enzymes combined have an amplified effect in terms of the enzymatic specificity of effect and thus the efficacy is strengthened in comparison to the use of an individual enzyme.

Masti Veyxym® fulfils the fundamental demands for a good level of efficacy, whilst at the same time producing minimum stress on the animal’s body and with no build up of residues, along with the absence of any environmental impact.
A reason for the steady increase in acceptance of enzyme therapy both in human and veterinary medicine is the understanding of the fundamental modes of action of the proteases in therapeutic use.
Mode of effect with Mastitis

In-vitro investigations at the Institute for Bacteriology and Mycology of the Veterinary Medicine Faculty of the University of Leipzig (KRÜGER et al. 1999, KRÜGER et al. 2002) show that the proteolytic enzymes Trypsin, Chymotrypsin and Papain degrade gram-positive and gram-negative bacteria, yeasts, prototheca, superficial structures and toxins, comprising of proteins, lipids or combinations of each. In addition fimbria, conjugation pili (resistance-transfer-factors), external membrane proteins, S-layer, binding proteins and bacterial enzymes such as coagulases, neuramidases, hyaluronidases, toxins or haemolysins are hydrolysed.

The growth of the bacteria is inhibited through to stasis or death by an alteration of the membrane protein (see Figs. 1 – 3). In yeasts pseudohyphae formation is prevented (see Figs. 4 – 5). In streptococci a reduction in chain formation is effected.

Overall, the enzymes reduce the superficial surface hydrophobic characteristics of the microorganisms and thus the pathogen’s adherence.

Exceptions exist with mycoplasma that proved indifferent in vitro against the pancreatic enzymes (Trypsin, Chymotrypsin). Papain in contrast has a microbicidal effect, that is significant with Mycoplasma (M.) bovis and Acholeplasma laidlawii, but less well exhibited with M. gallisepticum.

With intramammary application, but also using a systemic application, proteolytic enzymes achieve the breakdown of thrombi, fibrin concentrations and necrotic tissues, reduce the viscosity of the blood serum and intensify phagocytosis by the macrophages. An improvement in the microcirculation in the inflammatory regions occurs and the restoration of homeostasis. On the one hand the products of inflammation containing or comprising of protein, or tissue detritus, offer a good nutrient base for a bacterial colonisation. On the other hand they lower the effectiveness of antibiotics, because of their protein content and their differing pH-value. Thus proteolytic enzymes support the therapy with antibacterial chemotherapy and increase the rate of healing. The viable tissues are effectively not attacked by the enzymes during these 'cleaning processes' because of the presence of endogenous antiproteases in the undamaged tissues.
Results in cows with mastitis

Where enzymes are applied in the udder, then within the following 2 hours a flushing (stripping out) effect of the colonising bacteria develops (see Fig. 6). This is especially the case for microorganisms with a previously good defence mechanism that are attacked by the enzyme (e.g. *Staphylococcus aureus*), as their defence mechanisms have been neutralised. During the following hours massive cells, serum albumin and various unspecific humoral factors stream into the udder. This is to be evaluated as the activation of the body’s own defences.

The results of wide ranging investigations are available for the therapy of mastitis in cows using the Trypsin, Chymotrypsin and Papain containing preparation Masti Veyxym® (amongst others ZANDER 1997, KRÜGER et al. 1998, 1999). In these studies it was clearly demonstrated that Trypsin, Chymotrypsin and Papain can be applied effectively in the therapy of mastitis. Thus, compared to the sole use of an antibiotic, considerably higher bacteriological cure rates were achieved with subclinical, acute and chronic inflammation of the udder of varying microbial origins through the simultaneous giving of antibiotics (based on an antibiogram) and enzymes. Even in the normally difficult to therapeutically treat Staphyloccocal infections the rate of healing could be improved by 20 % with the additional enzyme treatment. Proteolytic enzymes thus support the therapy with chemotherapeutics and improve the rate of healing.
Fig. 1 - 3:
Survival rates of various udder pathogenic microorganisms following a two-hour treatment with a mixture of Trypsin, Chymotrypsin and Papain in comparison to untreated cultures/(negative control) = 100 %)
(KRÜGER et al. 1999)

The basic concentration of the enzymes (1.0 c) reflects the enzyme concentration in the udder that is to be expected based on a notional 50 ml residual milk quantity per udder quarter following the application of an injector of Masti Veyxym® with 8.0 mg Trypsin, 8.0 mg Chymotrypsin and 4.0 mg Papain.
Fig. 4 – 5:
Pseudohyphae formation of Candida albicans following treatment with a mixture of Trypsin, Chymotrypsin and Papain (2.0 c) in comparison to untreated cultures (KRÜGER et al. 1999)

Negative control

Following enzyme treatment

Fig. 6:
Bacteriological investigations of milk from a cow prior to and following treatment with one Masti Veyxym® injector
Mastitis Therapy Concepts
Masti Veyxym® makes antibiotics effective

The initial treatment with Masti Veyxym® should possibly be carried 12 hours prior to the first administration of the antibiotic. Thus milk ducts blocked by the products of inflammation are enzymatically "cleaned" and the antibiotic placed in the teat canal will also better reach the focus of inflammation.

It has been established, independently of the type of mastitis, for the final Masti Veyxym® treatment to be carried out at the same time as giving the final antibiotic dose. In this way it once again produces a massive elimination of the products of inflammation and possibly bacteria that are still present.

Prior to each intracisternal application the udder should be thoroughly milked out, possibly with the aid of an intravenous Oxytocin administration. Thus the residual milk remaining in the milk duct will be reduced (additional elimination of pus clots and pathogens, initial high concentration of the antibiotic to be administered).

The best treatment results will be achieved when Masti Veyxym® as well as the antibiotic is applied at least three times. For the combined treatment with an antibiotic and the enzyme preparation the clinical principle also applies, that treatment is to be maintained as long as it takes for the milk to become free of clots. That is to say, that the therapy must be appropriate for the respective infectious process. Thus the following treatment recommendations represent only an orientation aid.

Provided that the instructions for use for the antibiotic proposed for the therapy allows it, or the veterinarian does not determine otherwise, and on the basis of many years experience the following is to be recommended:

In case of subclinical mastitis (milk without visible changes, milk cell count increased, pathogens detected in the milk sample) as well as with chronic mastitis (milk with changes, no swelling or painfullness in the udder), where at the initial recognition no immediate antibiotic therapy is required, for the reasons previously illustrated, a Masti Veyxym® treatment is introduced. The antibiotic treatment is only commenced 12 hours later.
Recommendations for the application of **Masti Veyxym®** in **subclinical** and **chronic mastitis**:

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<td>1 injector Masti Veyxym®</td>
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*) With some antibiotic udder preparations the treatment interval is 12 hours.

In **acute mastitis** (milk changed, mainly no longer having a milk character, udder tissue swollen and painful, udder skin may be reddened, in some circumstances fever) an immediate treatment with antibiotics is required because of the severity of the infection. In order to improve the healing potential, Masti Veyxym® is given at the same time at the commencement of treatment.

Recommendations for the application of **Masti Veyxym®** in **acute mastitis**:

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<tr>
<td>1 injector Masti Veyxym® plus Antibiotic, e. g. Veyxid Pen Proc 3 Mega</td>
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The veterinarian decides whether in the case of acute mastitis, alongside the treatment via the teat canal, an additional injection treatment with antibiotics and/or antiphlogistics drugs or other measures must be carried out.

The information given in this product brochure conform to the state of knowledge on completion.
Veyx-Pharma is GMP- and QS-certified.

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