

References

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Acute irritant contact dermatitis from propionic acid used in animal feed preservation

RAINER HENSCHL, MONIKA AGATHOS AND REINHARD BREIT

Department of Dermatology, Hospital Munich-Schwabing, Koelner Platz 1, 80804 Munich, Germany

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Case Report

A 29-year-old farmer came with a painful, sharply demarcated erythema on the left calf, measuring 11×7 cm, with widespread blistering. 4 days previously, he had been in contact with Luprosil® (99.5% propionic acid) on setting up pre-wilted silage. The undiluted acid had penetrated his clothing onto this calf. Topical corticosteroids cleared the erythema and relieved the pain.

Discussion

Propionic acid ($\text{CH}_3\text{-CH}_2\text{-COOH}$) is a short-chain carboxylic acid. Some of its derivatives are active components of NSAIDs (e.g., ibuprofen and ketoprofen), occasional causes of (photo)allergic or phototoxic contact dermatitis (1). There have been no previous case reports of dermatitis after contact with unsubstituted propionic acid.

Its bacteriological and fungistatic effects have for a long time made propionic acid a successful preservative for baking products, cereals and other agricultural products, including animal feed. The climate of Southern Germany and neighbouring alpine countries means that, for 6 months of the year, preserved feed has to be provided for dairy cattle. Increasingly, silage is used (e.g., maize and grass silage) as a relatively low-loss preservation method (2). Here, following the creation of aerobic conditions and reduction of the pH value, the growth of lactic acid bacteria is promoted and unwanted micro organisms suppressed.

The use of unsubstituted propionic acid as silage agent is permitted in Germany (3), and it is also success-

fully used in other countries, as it improves the preconditions for good fermentation and generally stabilizes the silage. It is used at concentrations between 0.4% and 0.7%, for cut surfaces at 25% concentration (4). The biostatic effect prevents faulty fermentation with bacteria such as clostridia, or any growth of mould (5) that produces toxins.

Propionic acid, a strong chemical irritant, is widely used as an agricultural preservative. Particular care and attention is vital, especially when used at higher concentrations. The use of adequate protective clothing is recommended to avoid any skin contact with the risk of possible caustic burns.

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