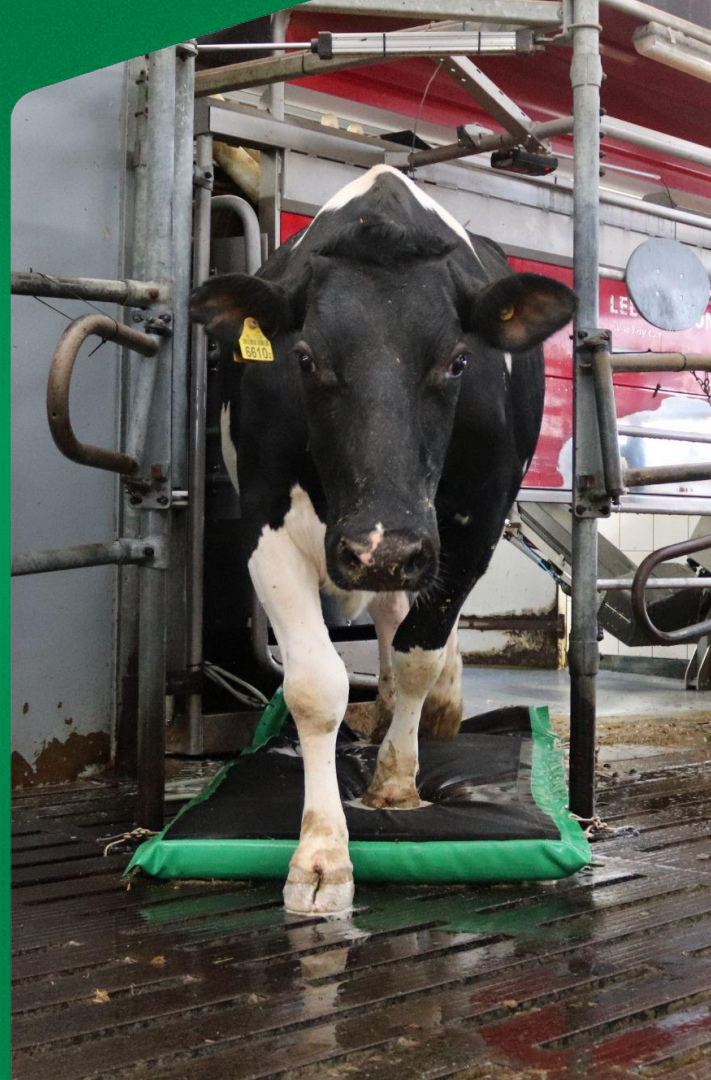


MS Schippers

MS HoofClean Protect

The first biological, highly effective
formalin alternative for automated hoof
baths



Content of this presentation

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The status quo: Severe chemical burns and environmental impact

Previously, Mortellaro control in conventional hoof baths relied on toxic, purely symptom-oriented chemicals.

A massive, mutagenic agricultural problem

- **11.2 million liters of formalin p.a.:**
In Germany alone, massive quantities of this carcinogenic hazardous substance pollute humans, animals, and soil every year.
- **Painful chemical burns:** Conventional products destroy the natural skin barrier and cause severe chemical burns on open wounds.
- **Slurry and soil contamination:** Heavy metals (copper/zinc sulfate) permanently accumulate in agricultural land.

Legal background and the formalin ban

Legal classification & practical restrictions

- Therapeutic ban (EU Regulation 2019/6):
 - Targeted treatment of acute conditions (such as Mortellaro) with formalin hoof baths is strictly prohibited under pharmaceutical law.
 - The exception: Since there are no authorized finished veterinary medicinal products for hoof baths in Germany, its use is only permitted as an absolute exceptional case during a veterinarian-declared 'therapeutic emergency' via a pharmacy formulation (ad us. vet.).
- Prophylactic regulatory hurdles (EU Biocidal Products Regulation / BAuA):
 - As a pure hygiene product (Product Type 3: Veterinary hygiene) for prophylaxis, formaldehyde-containing products may be sold, but they require official authorization from the Federal Institute for Occupational Safety and Health (BAuA) or the BVL.

Legal background and the formalin ban

Occupational health and safety & statutory substitution duty

Formaldehyde is officially classified as carcinogenic (Category 1B) and mutagenic (Category 2).*

This results in severe legal consequences for every farm manager:

1. Mandatory substitution assessment (Hazardous Substances Ordinance § 7)*: The farm manager is legally obligated to assess whether non-toxic, less hazardous alternatives exist on the market. With the existence of MS HoofClean Protect, this duty applies immediately!
2. Strict occupational exposure limits (OEL): Since formalin outgasses extremely heavily, draconic limits apply to barn air. Hoof baths can now practically only take place in highly ventilated outdoor areas.
3. Full PPE requirement: Mixing formalin concentrate strictly requires heavy personal protective equipment (respirator mask with gas filter, sealed safety goggles, chemical-resistant gloves).

*Carcinogenic classification: European Chemicals Agency (ECHA) / Risk Assessment Committee (RAC) – Formal classification of formaldehyde as a Category 1B carcinogen (effective since the 6th ATP to the CLP Regulation). [Source: <https://chem.echa.europa.eu>]

*Substitution duty & occupational safety: Federal Institute for Occupational Safety and Health (BAuA) – Technical Rule for Hazardous Substances (TRGS 600 'Substitution'). This clearly states that Category 1B hazardous substances must strictly be replaced by less hazardous substances, provided this is technically feasible. [Source: <https://www.baua.de/DE/Angebote/Regelwerk/TRGS/TRGS-600>]

The innovation: Regeneration through biological recognition



Gentle exfoliation instead of harsh chemicals

The core of MS HoofClean Protect is based on natural willow bark extract with physical deep action.

- **Pore opening & cleansing:** Has a gentle exfoliating effect. It removes dead skin cells and opens the pores for deep-pore cleansing.
- **Skin structure from within:** Reduces swelling, relieves wound pain, and stimulates the body's own cell regeneration directly at the lesion.
- **Strong foam adhesion:** Special, skin-friendly surfactants create a stable, long-lasting protective foam film.

Sustainability in black and white

MS HoofClean Protect proves that maximum medical efficacy and uncompromising environmental protection go hand in hand.



Certification

Approved for organic production in accordance with Regulation (EU) 2018/848*

Biodegradability

>99% biodegradable within a very short time. Absolutely harmless to slurry quality and soil.

Skin-pH value

pH 6.3 (skin-neutral) – Prevents any skin irritation or painful burning

**FiBL certificate included in the supplement

The overall concept: The MS AutoHoofClean system

Fully automatic 24/7 application during herd movement

MS HoofClean Protect achieves its maximum performance in combination with the intelligent MS AutoHoofClean mat.

- **The alternating dose (7-day logic):** MS HoofClean Care cleans the hoof for 4 consecutive days; MS HoofClean Protect regenerates the tissue during the remaining 3 days of the week.
- **Adaptive dosing:** Fully automatic dosing via the control unit (medium setting during the initial phase, low setting in maintenance mode).



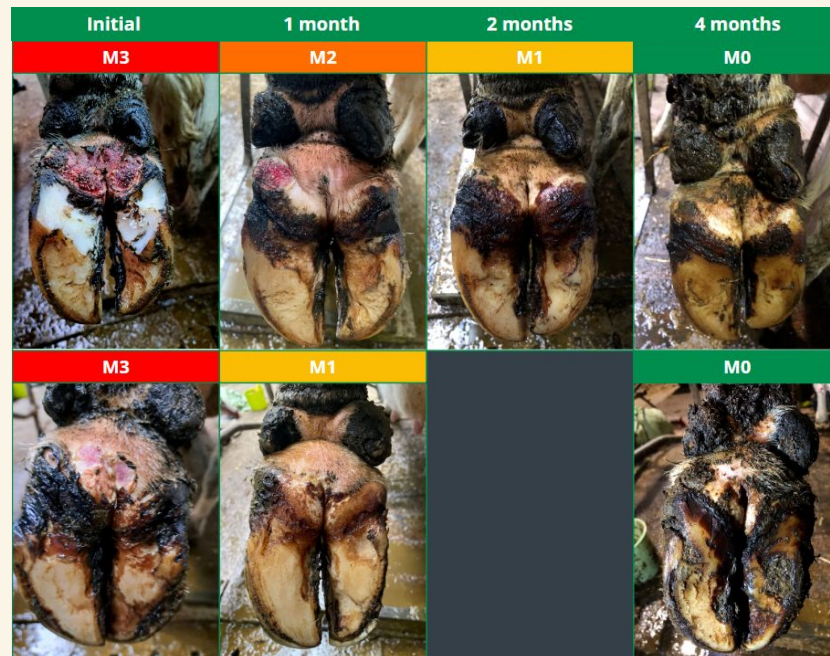
Research and field trials: Netherlands

Significant reduction of infection pressure

Large-scale field trials (2024) on robot farms and conventional milking parlors delivered clear ICAR hoof health results.

- > 65% Mortellaro reduction (from M3/M2 to M1/M0) within the first 3 months under the 'Medium' system setting
- 65% Mortellaro reduction (from M3/M2 to M1/M0) within the first 3 months under the 'Medium' system setting
- 50% of all infected hooves reached the fully healthy M0 score (healed) after the trial period

*Detailed study information included in the supplement



Field trial France: 120 cows



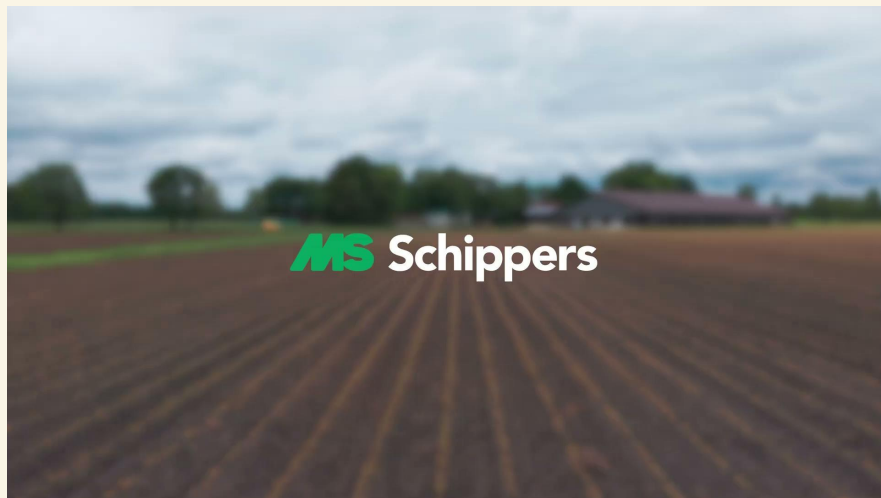
Seamless documentation via HyCare app

In January 2025, the system was validated on a dairy farm in France using app logging.

- **Acute healing:** At the beginning, 6 out of 10 documented problem hooves exhibited severe Mortellaro ulcers (Score 3)
- **The 2-month success:** After just 60 days, the number of severe lesions dropped to only 2 hooves on herd average
- **The 4-month final result:** No more severe or significant lesions (Score 2 or 3) in the herd, only healed or minimal traces visible

*Detailed study information included in the supplement

Practical example: Hendrik Kamp



Farm profile: 130 cattle, 120 dairy cows on 2 milking robots

Initial situation in the old barn: High Mortellaro pressure, time-consuming & stressful individual animal treatments in the hoof trimming chute.

Results & practical experience after 9 months

- Mortellaro pressure massively reduced; no new cases in heifers and freshly calved cows.
- High willingness to walk: Pain-free application maintains cow traffic at the milking robot.
- Minimal effort:
 - Briefly hosing down the mat twice daily.
 - Drum replacement only every 2 to 3 months (pump sends automatic notification).
 - Mat service life: approx. 8 months for 120 cows.

Economic efficiency

9,0 L

Weekly maintenance requirements

Under the 'Low' setting in the automated milking robot system, high yield guarantees low running costs

Product	AHC Pump setting	Dosage (%)*	Consumption (L/week)
MS HoofClean Protect	Low (Maintenance)	1.71	9.0
	Medium (Start-up)	2.47	15.0
	Low	2.09	10.89
MS Formades	Medium (Maintenance)	2.84	14.85
	High (Start-up)	4.40	23.76

*Comparison MS HoofClean Protect vs. MS Formades (Formaldehyde)

Advantages at a glance

100% occupational safety/ worker protection

No manual contact with highly toxic, carcinogenic hazardous substances required on the farm anymore.

Animal health: Mortellaro reduction

Field trials show a reduction of severe Mortellaro lesions (M2/M3 scores) by over 90% within 6 months

Environmental Protection:

MS HoofClean Protect features a >99% biodegradable formulation that protects soil and slurry quality.

Increased willingness to walk:

The completely painless application maintains cow mobility, which is essential for high frequency at automated milking systems (milking robots).

Cost efficiency:

Following the initial phase, a low maintenance dose in the system is sufficient. Furthermore, lower treatment and drafting workloads combine with higher lifetime performance of the dairy cows.

Questions about the innovation?

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