

Footbath Alternatives

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Introduction

With the price of copper sulfate escalating to more than \$70 per bag, many herds are looking for alternatives to decrease footbath costs. There seems to be some confusion about what different chemicals are doing, so it is perhaps timely to review our footbath goals.

Treatment or Prevention

Let us be very clear. Footbaths are used for prevention not treatment of active painful lesions. Lamé cows with heel warts must be identified through locomotion scoring and be individually examined. Topical antibiotic therapy with a light wrap is the mainstay of treatment.

Think of footbathing feet for the control of heel warts similar to the use of teat dip for the control of contagious mastitis. It does not treat active infections, but it helps control the spread of infection from cow to cow. For that reason, in most freestall barns, footbaths must be used frequently – but there is farm to farm variation depending on hygiene.

Leg Hygiene Determines Frequency

The more manure contamination of the lower leg, the more frequently we must footbath. While some farms with excellent leg hygiene may use a footbath only once a week, others must footbath 5-7 days per week.

Use a hygiene scoring assessment to determine frequency. Score the manure accumulation on the hoof and leg of the rear feet on a four-point scale where 1=clean, 2=splashes, 3=plaques but hair visible and 4=plaques and no hair visible.

In herds with fewer than 25% of cows scoring a 3 or 4 score, footbathing can be done as needed. Heel warts are rarely a problem. Conversely, where herds are >75% 3 and 4 scores, then footbathing is probably a necessity 7 days per week.

Typically footbaths can be run twice a day, even in 3 times a day milked herds, BUT if the footbath is not in use, cows MUST be able to bypass it and not walk through a pit of manure. If there is no way around the bath – put something in it!

Cows appear to be more susceptible to heel wart infection in early lactation, so the final footbath frequency for groups WITHIN a herd can be manipulated.

For example, the close up group can be footbathed once a week if we push cows through a bath at least twice. Early lactation cows should be footbathed at the maximum recommended frequency determined by leg hygiene. Late lactation cows may be footbathed at 50-75% of the target frequency in order to save on chemical costs.

Hoof and Leg Hygiene Scoring Chart

Score at least 20% of the cows in each pen in free stall herd or all of the cows in tie stall herd

Score 1	Score 2	Score 3	Score 4
			
Clean, little or no manure contamination of the lower limb	Slightly dirty where the lower limbs are lightly splashed with manure	Moderately dirty where there are distinct plaques of manure on the foot progressing up the limb	Very dirty where there are confluent plaques of caked on manure on the foot and higher up the lower limb

Interpretation

Proportion of cows scoring 3 and 4	Comment	Your Herd	Suggested Foot Bath Frequency
<25	Good		As required
25-50	Fair		2 days per week
51-75	Poor		5 days per week
>75	Very Poor		7 days per week

Footbath Location and Design

Footbaths are frequently poorly designed and located. The best places for them appear to be in transfer lanes between the holding area and the pens and in the return lanes either side of the holding area. In return lanes, make sure that the bath is located two thirds of the way down away from the parlor so that cows do not create a jam leaving the milking area.

Twin baths are optional. If a wash bath is used it should be located 4-6 feet in front of the treatment bath. Wash baths immediately adjacent to treatment baths allow for carryover of wash solution into the treatment bath as the cows splash through – diluting the active concentration of chemical.

The treatment bath should allow for at least a 5 inch depth of solution and be at least 8 feet long, preferably 10 feet. Width is determined by the width of the alley. The floor of the bath should not be excessively rough, but it should be non-slip.

Chemicals - Cleaning Agents vs Disinfectants

Footbath solutions may help clean the foot of manure and disinfect the interdigital space. Do not confuse the two actions.

Solutions of hand soap or rock salt are probably primarily cleaning agents – they loosen manure on the foot and allow oxygen to get to the interdigital space. They can be used in the footbath program, but should probably not be the only chemicals used.

Other chemicals are disinfectants. These are the traditional copper and zinc sulfates, formalin, quaternary ammonium compounds and a range of commercial products. Footbath programs should always contain one or more disinfectants.

Antibiotics should only be used in outbreak situations where the infection rate must be brought under control – in these situations Lincomycin or Oxytetracycline can be used extra-label UNDER VETERINARY DIRECTION for a short period of time (3-6 milkings) and then a disinfectant can be used to maintain the improvement.

Foot Bath Concentration Calculator

Volume of Foot Bath

$$\text{Length (ft)} \times \text{Width (ft)} \times \text{Depth (ft)} = \text{Gallons}$$

$$8 \times 2 \times 0.5 = 7.46$$

Gallons

60

Amount of Chemical

Chemical	Dose		Lbs/bath	Quarts / bath	Sachets / Packs/bath
	%	(quarts per gallon)			
1 Coppersulfate	5		24.9		
2 Copper sulfate	10		49.7		
3 Golden Hoof	10		49.7		
4 Copper Hoof		0.04		2.4	
5 Healthy Foot (Footbath Booster + Copper)	1.7	0.04	8.5	2.4	
6 Zinc sulfate	5		24.9		
7 Zinc sulfate	10		49.7		
8 Super Zinc	10		49.7		
9 Rotational Zinc		0.04		2.4	
10 Hoof-Zink		0.12		7.2	
11 Provita Hoofsure Endurance	1	0.04		2.4	
12 37% formalin	0.5	0.02		1.2	
13 37% formalin	2	0.08		4.8	
14 37% formalin	3	0.12		7.2	
15 37% formalin	5	0.2		11.9	
16 New-Hoof Concentrate		0.02		1.2	
17 Double Action		0.08		4.8	
18 Victory		0.02		1.2	
19 HoofPro+		0.04		2.4	
20 Mild soap		0.04		2.4	
21 Hydrated Lime	6		29.8		
22 Rock Salt	6		29.8		
23 Lincomix 169	0.01	0.46			1.7
24 Lincomix 169	1	4.6			17.2
25 Oxytetracycline 102.49	0.1	3.94			2.3
26 Oxytetracycline 102.49	0.8	31.5			18.4
27 Bovi-Foam			no specific dose		
28 Kovex Foam			no specific dose		

In designing a footbath program, cleaning agents can be used for one third to half of the time, then disinfectants can be used for the remainder.

Most chemicals are active for around 200 cow passes – formalin may last 300 cow passes, some chemicals last only 150 cow passes. Activity will also depend on the amount of manure contamination.

The most common footbath chemicals used on dairy farms are listed above along with dose rates for a 60 gallon bath.

Replacements for Copper Sulfate

There are two approaches to take;

1. Use copper sulfate, but use less of it

We can do this by substituting a cleaning agent for some of the baths instead of using copper – liquid hand soap or rock salt are commonly used, OR we can use additives to the copper sulfate so that we can lower the effective concentration. Two example compounds are Footbath Booster/Healthy Foot from SSI Corp/Dairy Solutions Inc. and PediCure from Westfalia Surge. These acids allow the copper to dissolve and become more active, reducing the effective concentration to around 2% instead of 5-10%.

2. Use something else instead

There are lots of other chemicals to choose from. The cheapest is probably formalin BUT be careful. This is a carcinogen and very careful handling is required. Use of the chemical on dairy farms is probably difficult to justify, but it is effective. If formalin is used, use a step up program, such as 2% week 1, 3-4% week 2, 5-6% week 3, then return to 2% for control.

Other alternatives that appear to be efficacious are Double Action from West Agro, Victory from Westfalia-Surge, and several other commercial products.

Zinc sulfate is a viable alternative that is efficacious, but the main complaint is that it dissolves poorly. There are several commercial products the most recent one being Hoof-Zink from Sirius, LLC (402-315-9294). This is a liquid zinc which is much easier to handle on farm and there are good reports of efficacy in the field.

Disclaimer

Because of the lack of scientific data on many of the footbath products commonly used, the information provided here has come largely from field experiences and reflects the views of the author, Karl Burgi and Roger Blowey. It should in no way be viewed as the last word and it is far from peer-reviewed. However, I do hope you find it of some use.