

Footbaths in both pastoral and housed dairy systems

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Introduction:

Footbaths in dairy systems are an essential part of the design. To control the existing issues of foot rot and for prevention and control of Bovine Digital Dermatitis (BDD) a footbath in the exit of the milking facility is the recommended solution. All new sheds should have foot baths, and existing sheds should seriously consider installing one.

Why we need footbaths:

Footbaths are effective for disinfecting cow's feet. They allow the opportunity to apply a solution to each cow's feet for the control of infection at every milking. Some farms use formalin, zinc sulphate or copper-sulphate in an attempt to harden the hoof.

1) Footbaths and Foot-rot control

- Foot-rot begins with a break in the skin between the claws. If this skin crack gets infected, foot-rot develops.
- Footbathing morning and night twice weekly may be sufficient to prevent foot-rot outbreaks.
- Eliminate wet areas around water troughs, gateways and sides of tracks.
- Avoid using fine gravel (less than 1 cm diameter) in gateways and around water troughs
- Tracks should be well drained to reduce the build up of fine stones and mud along the edges.
- Always check any limping cows for stones lodged between the claws.

2) Footbaths and Control of Bovine Digital Dermatitis (BDD)

- BDD is a highly infectious disease of the skin below the dew claws. This disease is already present in NZ herds.
- A free herd should consider quarantine because once the disease is established in a herd it seems impossible to eliminate.
- Regular foot-bathing will be an essential part of the control measures needed, once a case is identified.
- Regular foot-bathing (together with individual treatments) may help prevent BDD establishing itself in a herd if there is a very low prevalence.
- The BDD infection is spread from cow to cow via dirty foot conditions.

3) Footbaths and hardening of claws

- Many farmers have anecdotal evidence of foot-bathing reducing lameness caused by damage to the wall or sole of the claw. These same farmers say that the feet are much harder after regular foot-bathing.
- No trial work to date has been able to replicate this, but fortunately the same products are beneficial for control of both foot-rot and BDD.

Footbath Design and Position:

To have a footbath programme running effectively some things need to be taken into consideration in both the design of the footbath and the implementation of its use. The bath must cater to good cow flow and be a permanent feature in the exit of the shed. It must be large enough to hold sufficient volume for the number of cows passing through, at one liter per cow, while remaining no greater than 3 metres long to reduce contamination. It is important to build the bath in an area that has easy access to water for cleaning and filling and access to drainage with environmental considerations.

- 1) **Build the footbath in the exit race** (never in the entrance to the shed where it becomes a gravel trap and affects the cow flow of the whole herd). Ideally, there should be space for half a row of cows to stand before the footbath.
- 2) **The footbath must be part of the exit race itself** (not a diversion) so that the cows are used to it, and walk through it every milking even if there is no solution in it.
- 3) **Wide footbaths** allow better cow flow. For herds of up to 250 cows make it 1.5m wide. For larger herds make it at least 2m wide.
- 4) **The length must be at least 2.5 metres** but a maximum of 3 metres (then the cows will take 3 steps with their leading foot and 2 steps with the following foot – a cow step length is approximately 750mm). Contamination levels with this design are low with, on average, only about 3 or 4 cows per 100 defaecating in the bath. This means that you can use the same solution for up to two milkings in a row before it must be cleaned out.
- 5) **The floor of the bath must be the same level as the approach concrete and exit concrete** - i.e. no stepping down or up into the bath.
- 6) **The solution depth needs to be 8 - 10 cm**, so use 20cm concrete blocks to reduce loss of solution from splashing.
- 7) **The simplest design** is build your cowshed and yards and then **on top of the concrete** build the foot bath with concrete blocks or poured concrete. (See photograph) Put a drain in the lowest corner for easy draining and cleaning.
- 8) **It is important that the tops of the blocks are flat** (not rounded), but just with the sharp edge angled off to prevent dew claw damage. Cows have difficulty judging foot positioning with rounded surfaces.
- 9) **The volume of the bath** must be sufficient to allow one litre per cow in the herd.
- 10) **Drainage design for easy cleaning** is important. A hole and a bung in the lowest corner works, but makes for slow rinsing out. A sluice gate, 200 – 300 mm long, in the lowest corner and sliding into inserted rubber slots makes an existing bath quicker to clean out.

The best design is a 100 – 150 mm “plug hole” drain built into a side extension at the lowest corner of the bath. This extension protects the plug bung from damage from the cows’ feet.



How to work out the footbath dimensions for the size of your herd:

The volume should be one litre per cow. With the design above, the solution can be used for up to two milkings in a row without the contamination diluting the solution too much.

10cm deep is plenty of depth. Each square metre of footbath will then be sufficient to hold 100 litres. So the dimensions for 500 cows would be 2m wide x 2.5m long (=5 sq m) x 10cm deep = 500 litres.

If you are building on existing concrete it may not be perfectly level. It doesn't matter if one end is slightly deeper than another. To achieve the correct volume the average depth of the solution at each corner should be 10 cm (measure the depth of all four corners and divide by 4). If the shallowest corner is less than 5 cm, put a 20 litre drum at that corner to force the cows to walk through the deeper side (or every cow will choose the shallow end – cows are smart!)

Frequently Asked Questions

What solutions can be used?

- 1) **Formalin (4%)**. “Formalin 4%” is made by adding 40mls of “37% Formaldehyde” to 960ml of water. It is recommended to use Formalin at 2% initially for a week before increasing to the 4% solution to get the cows used to it.
- 2) **Copper Sulphate (2.5 to 5%)**. Copper Sulphate 5% is made by mixing 50 gms of Copper Sulphate crystals in one litre of water. Acidified copper products are available with the advantage of less copper being needed.
- 3) There are other commercial products with claims for control of BDD coming onto the market.

Should a water pre-bath be used?

For pasture systems, a water pre-bath is seldom needed.

For indoor systems where foot cleanliness is a problem a water pre-bath will possibly be an advantage.

Separate the pre-bath of water by at least 3 to 5 meters to allow water to drain off the feet before entry to the solution bath. This separation also reduces faecal contamination in the solution bath

How often do I put the cows through the footbath?

Ideally cows should be foot-bathed every milking to properly control BDD. However depending on the percent of the herd infected, the seriousness of the lesions and the cleanliness of the feet it seems that some farms can control the disease with as little as two to three baths per week.

The scientific way to make this decision is to screen the whole herd before starting the use of the footbath and repeat the screening 6 – 8 weeks later to measure the effect. (See www.lamecow.co.nz for the method of screening)

Aren't there problems to humans and the environment with formalin and copper products?

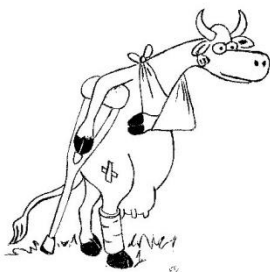
Formalin is banned in a few countries as a footbath solution due to possible human health problems from the fumes if not dealt with carefully. It should always be used where there is plenty of ventilation. If the footbath is under a roof, formalin is not recommended because of the fumes. Formalin is not an environmental risk in the sense of accumulation, because it is a natural gas in the environment and evaporates quite rapidly.

Copper sulphate is banned in some countries as a footbath solution because of its accumulation in soils. Copper sulphate is an environmental hazard if discarded onto pasture. Acidified copper sulphate enables lower levels of copper sulphate to achieve the same effect in the footbath.

Aren't there problems with either cold or hot weather when using formalin or copper sulphate?

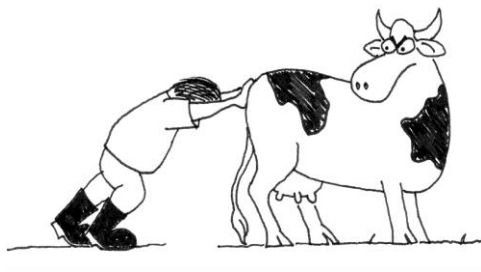
If solutions are left in footbaths between milkings overnight in cold weather or during the day in hot weather there can be problems with precipitation of copper or evaporation of formalin.

Footbaths should generally only be used once unless the contamination rate is very low. In this case there is no problem with air temperature if the solution is made up with water at a suitable temperature just before the beginning of milking.



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Visit: www.lamecow.co.nz



For information and learning resources on cow flow and low stress handling

visit: www.lowstressdairy.nz