

Honey for veterinary wound management

Honey isn't just good to eat – it has great wound-healing properties

Bees manufacture honey as a way to store sugar-rich nectar harvested from flowering plants. We use this yummy, sticky substance as an ingredient in many recipes, or enjoy it on its own. However, did you know that honey has excellent wound-healing properties? Its usefulness for wounds has been documented for centuries in Greek, Egyptian and Roman medicine.

What is special about honey?

Bees have an incredible system for harvesting and storing nectar to preserve it as solely as a food source. The properties bees add to it not only help decontaminate wounds, but also aid in debridement.

Bees not only carry their own weight in nectar, but also a huge array of bacteria, yeasts and fungi picked up from the soil and plants within their three-mile territories. Found in their intestines, this array of bugs can include dangerous species such as *Clostridium botulinum*, *E. coli*, *Klebsiella*, *Proteus* and *Pseudomonas species* -- the latter being particularly detrimental to wound healing. Without some form of processing, therefore, the nectar would be a death trap to both bees and humans.

Bees harvest nectar from flowers and store it in a specialized stomach. As they store the nectar, they transfer in a special enzyme called glucose oxidase to lower the pH, and add an antimicrobial. Once the stomach is full, the honey solution (of around 70% water) is delivered to worker bees at the hive, who pass it on from mouth to mouth until it reaches the bees at the comb. Each bee will add its own enzymes and reduce the water content. Once placed in the comb, the honey will be fanned to evaporate any residual moisture and bring the water content to below 20%. This supersaturated sugar is now honey.

The benefits to wounds

The application of honey to wounds is not new. Two key benefits have been seen. The first positive effect is a debriding (cleansing) action, and the second is the resolution of infection. The high sugar causes an osmotic effect that aids in the softening of dead and sloughy tissue while assisting in the removal of debris. Secondly, the low pH combined with the effect of glucose oxidase can reduce the viability of bacteria in the wound. These two actions are synergistic; healing

is now recognized to progress most effectively when the bio-burden is reduced and a moist environment maintained.



The secret of glucose oxidase

Throughout its storage, despite the bacterial and fungal spores within it, honey remains airtight and safe, sealed in the comb.

The glucose oxidase deserves further explanation; it is an effective antimicrobial backup that is activated upon dilution. As the moisture content increases, glucose oxidase reacts and releases tiny levels of hydrogen peroxide and gluconic acid. This process has an antimicrobial effect on local microbes, including many common wound pathogens.

Amazingly, the levels of hydrogen peroxide released by this glucose oxidase reaction are close to those produced by neutrophils at wound beds in our own bodies' defense against microbial proliferation.

Unfortunately, as with all enzymes, glucose oxidase is denatured by heat. Any benefit will be lost during the pasteurization process used as a standard method to reduce contamination of food grade honey.

Even if we can source unpasteurized honey to be sure we have preserved the glucose oxidase enzyme, the residual bacteria and spores may become viable in wounds due to rapid dilution through osmosis. The best option when searching for honey to use in wound care is to opt for cold (gamma) sterilized medical grade honey that guarantees sterility while maintaining the functionality of beneficial enzymes.

The Manuka effect

A lot of attention has been given to Manuka honey for its special abilities as an antimicrobial. This is because nectar from the Manuka plant contributes its own antimicrobial chemistry on top of that provided by the glucose oxidase effect.

Professor Peter Molan of the University of Waikato in New Zealand led research that found honey derived from the Manuka plant (*Leptospermum scoparium*) exhibited an exceptional antimicrobial profile comparable to topical gentamycin. A compound called methylglyoxal has since been identified that enables a sustained antimicrobial effect even upon dilution by up to ten times volume for volume. The concentration of methylglyoxal present in Manuka honey has been found to be directly proportional to its antimicrobial effect.

This means that it can be used reliably to test large batches of honey for antimicrobial potency for commercial use.

Each batch of honey is tested for its methylglyoxal concentration and tested for antimicrobial effect against phenol as a control. If the compound is as effective as a 10% phenol solution, then it is given a +10 rating. The test increases to +15 against a 15% phenol solution and so on and so on. For wound management a +10 rating is sufficient to combat most pathogens.

Honey is a natural miracle. With antibiotic resistance in the news and home health a booming industry, its demand has quickly begun to outstrip supply. Medical grade honey, although potentially higher in price per gram, is the only way to guarantee efficacy for use in open wounds. Clinically harvested, prepared and filtered, it is gamma sterilized to preserve the essential plant compounds and enzymes that guarantee its antimicrobial effect. [Combined with the osmotic power and low pH of honey, the Manuka factor adds what is becoming a valuable tool to help clean up wounds while defeating bacteria.](#)

By Georgie Hollis

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KRUUSE Manuka Honey

Very high quality of medical grade honey to promote moist wound healing. Manuka honey has a recognized effect on supporting the wound healing process.

- Promotes a moist wound environment conducive to healing.
- 100% pure medical graded Manuka Honey from *Leptospermum scoparium*, a small bush/tree from New Zealand
- Sterilized by gamma radiation that does not destroy glucose oxidase
- KRUUSE Manuka honey has unique properties compared to other types of honey and dressings



Promotes moist wound healing

The features of KRUUSE Manuka Honey help the autolytic debridement and enhance the moist wound healing in many ways.

Honey's pH creates the desired acidic environment

Honey's pH (3.6–3.7) creates the desired acidic environment that has been shown to decrease bacterial growth, increase fibroblast activity, and increase oxygen release, all of which promote wound healing further.

Osmotic action due to honey's high osmolarity

Increased osmolarity draws fluid and lymph from the underlying tissues and this fluid provides nourishment to the healing wound.

Glucose oxidase effect

Glucose oxidase produces hydrogen peroxide and gluconic acid, which provide the main antibacterial qualities of honey. The well-tolerated, low levels of hydrogen peroxide promote angiogenesis and fibroblast activity, enhancing oxygen delivery to tissue.

Reduced Cost

The dressing can be left on the wound for 3 to 5 days depending on the wound status. This reduces the number of dressing changes, need of sedation and bandage material.

Easy to apply

After wound bed preparation simply apply the dressing needed. Evaluate the wound for amount of exudate and time to the next dressing change.

Reduces smell, leads to good compliance from the patient

When the honey works and reduces the bacteria burden, it often takes away the bad odour, that comes from an infected wound.

Tip

Wounds with no infection apply HydroGel to maintain a moist wound healing

Recommended use for KRUUSE Manuka Honey

KRUUSE Manuka Honey ND non-adherent dressings

- For wounds with little exudate or in combination with KRUUSE Manuka gel.
- Honey impregnated into acetate gauze.

KRUUSE Manuka Honey AD absorbent dressings

- For wounds with moderate to heavy exudate
- Honey impregnated into a pad of super absorbent polymers.

KRUUSE Manuka roll is a unique product ideal for large vertical wounds.

Example: Equine forelimb.

KRUUSE Manuka G gel

- Honey gel for cavities



Instructions for use

Application

After wound bed preparation simply apply the dressing needed.
Evaluate the wound for amount of exudate and time to the next dressing change.

Use KRUUSE Manuka Honey as primary dressing alone or in combination with:
KRUUSE Hydro Gel.

Primary dressing suggestions

- KRUUSE Manuka Honey

Secondary dressing suggestion

- KRUUSE Foam Dressing

Tertiary bandage

- KRUUSE Soft-Flex
- KRUUSE Vet-Flex

Removal

Remove dressing and flush away the honey to evaluate the wound and e.g. do debridement.

For veterinary use only

Tips/FAQ

- Avoid disinfectants unless necessary, as they are toxic to cells.. also the cells, which enhance moist wound healing. Use Manuka honey and products for moist wound healing instead
- Moist retention dressings absorb excessive exudate and supports autolytic debridement.

- Why does Mother nature provide a scab if moist wound healing is better?
Many wounds will slowly heal underneath a scab, but moist wound healing products and principals supports and speed up the time of healing
- The purpose of a scab is to protect the wound from contamination from the outside, but it also reduces the process of the regeneration of new cells and tissue.
- Will the wound heal underneath a scab?
Yes, probably, but with more pain and a lot slower with a higher risk of infection and more unattractive scarring.

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