



# The Importance of Sugar

BEET HEET® Concentrate contains significantly more sugar than any organic/chloride deicer in North America. When it comes to enhancing the deicing and anti-icing performance of rock salt and sodium chloride brine, the benefits of adding sugar are far reaching and significantly more important than many snowfighters realize. Here are several performance enhancing benefits that the sugars in BEET HEET® (BH) provide when BH is added to rock salt and brine at meaningful levels.

1. The sugars in BH suppress the freeze point of rock salt and brine.
2. The sugars in BH lower the effective working temperature of rock salt and brine.
3. The sugars in BH increase the ice melt capacity of rock salt and brine.
4. The sugars in BH significantly reduce the corrosion value of rock salt and brine.
5. The sugars in BH act as cryoprotectants. Cryoprotectants significantly slow down the rate at which water freezes. All deicers eventually dilute out by the snow and ice they melted leading to “refreeze”. In fact, the better a chloride deicer melts ice, the faster it dilutes out and freezes. Calcium chloride ( $\text{CaCl}_2$ ) is a perfect example of this phenomenon.  $\text{CaCl}_2$  “flash” melts snow and ice and then “flash” freezes.

Slowing down the rate at which the melted snow and ice refreeze is huge given the fact that most roadway surfaces are crowned. Significantly slowing down refreeze allows the melted snow and ice to run off the road surface before refreezing. Therefore, conditions that refreeze can cause snowfighters and traveling motorists are largely eliminated!

Cryoprotectants also inhibit the formation of ice crystals. Deicers and anti-icers containing sugar at meaningful levels are significantly more effective at preventing frost and ice formations!

6. The sugars in BH significantly strengthen and extend the anti-bonding characteristics of rock salt and NaCl brine. This is huge considering the costs of removing bonded precipitation verses removing un-bonded precipitation. Strengthening the anti-bonding performance of salt and brine becomes even more important as weather events intensify.
7. The sugars in BH make BH a tackifier. Pre-wetting rock salt with a heavy, sticky tackifier reduces bounce and scatter loss far more than pre-wetting agents containing little to no sugar. When it comes to anti-icing, the longer an anti-icer is held in the target area, the more ice it will melt in the target area. Anti-icers with little to no sugar quickly dilute out and are washed away, or they dry up and blow away. Regardless, anti-icers containing sugar are far, far more effective because they stay in the target area much longer.
8. The sugars in BH significantly strengthen and extend the residual effect of rock salt and NaCl brine. In fact, just the leftover residue from BH treated rock salt acts as an effective anti-icer at the next snow event! Just think, anti-icing without anti-icing! Yes, it works!
9. The dark sugars in BH reduce the very high albedo values of rock salt and brine. Albedo is the reflective value of an object. The lower the albedo value of rock salt and brine, the more solar radiation (heat) they can absorb and emit. The dark sugars in BH darken white rock salt and clear brine transforming them into heat (radiation) absorbers and emitters which significantly improve their ice melting capacity. Even on cloudy days up to 50% of the sun’s radiation still reaches the earth’s surface. Clear deicers like 32%  $\text{CaCl}_2$ , 23.3% NaCl brine and deicers containing corn syrup do not have this ability.