

Water: A nutritional secret

John Goeser for *Progressive Dairyman*

AT A GLANCE

Optimizing water intake helps cows capture the full nutritional value from the TMR and can equate to better health and performance.

Water adds zero energy to a high-producing cow's diet, yet it is a critical nutrient for survival and capturing said energy and nutritional value from the dairy cattle diet. Water doesn't provide protein, carbohydrates or fat but has been acknowledged as the most important nutrient for dairy cattle. Fully regarding and understanding water quality and intake should be as important as having a firm grasp on a dairy's dry matter intake. Rarely is this the case, however, and many dairies stand to benefit from a focused review of water quality.

High-performing cattle can drink over 90 litres of water per day. This volume and intake is often an afterthought in dairy nutrition programs, with many dairies only considering water quality



Photo by Mike Dixon.

Feed, fecal bacteria and water-borne contaminants should be cleaned out of waterers routinely.

when troubleshooting health and performance challenges. But mineral contributions from water demand consideration along with dietary supplements. In 2013, researchers estimated a high-performing cow may derive around 30 to 40 percent

of its sodium, chloride and sulphur requirements from average water. Many nutrition models incorporate water mineral supply into dietary evaluations.

Minerals may exist in free or bound forms within water,

depending on several factors, including pH. Excessively hard water (substantial mineral content) can lead to mineral absorption challenges with minerals supplied in the TMR. For example, high iron levels are a common occurrence in

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many wells, and a Michigan State University professor has recognized excess soluble iron can interfere and compete with copper and zinc absorption. After working with many farms across the U.S., the professor discussed how high iron and chloride or sulphate (anions) levels are the most common anti-quality factors on farms that may pose cattle health challenges.

Water can also introduce many other challenges to dairy nutrition programs via quality-reducing (or anti-nutrition) factors. The primary concern with anti-nutritional factors in water relate to water taste and smell (palatability; intake potential). Adequate water intake is necessary to maintain hydration and normal metabolic activity, allowing the cow's body to function. Physiochemical factors (explained below) can substantially decrease palatability. It is difficult to comprehend a dairy cow's sense of smell or taste, but the cow is likely far more sensitive with taste and smell senses than a typical human. Physiochemical factors in play within livestock water include total dissolved solids, sulphur or sulphate, chloride, nitrate, manganese and fluoride. Water may also harbour pathogenic bacteria or nitrates, which could directly harm cattle.

Beyond hydration, mineral supply and quality-reducing factor impacts on dairy cattle, water can pose facilities and management challenges as well. Iron and physiochemical factors can cause water flow and waterer challenges. Excessive iron may even permit iron bacteria to grow and plug water lines and systems. Plus, water quality in wells may already be inconsistent. Mineral levels and total dissolved solids may fluctuate with the seasons or rainfall degree during the year.

If you suspect your water quality could be a limiting factor for your dairy's health and performance, start by assessing water quality with a livestock water analysis. It is recommended we sample from a clean tap (heated with a torch to eliminate bacteria) or allow water to run for several minutes prior to sampling into a plastic, screw-top container that excludes air. After sampling, store the sample in a refrigerator until sending to the laboratory.

If water quality-reducing factors are present, determine what factor and what the appropriate solution is, as there is no single solution to cleaning up water. Several dairy services or products exist that offer options to address specific water quality concerns, such as shock treatments, filters, reverse osmosis water treatment or even drilling a new well. Ask pertinent questions and, before making a commitment, ask for independent research and verification the solution is proven. Then, follow up with monthly samples after a solution has been

implemented to ensure the water quality issue has been appropriately addressed.

Think of water intake more closely to how you calculate dry matter intake – it is that important. Follow good management practices by flushing and cleaning your dairy's waterers routinely and following the guidance of your advisory team. Feed, fecal bacteria and water-borne contaminants should be cleaned out of waterers routinely. Work with your nutrition advisory team and more regularly discuss water quality as part of your nutrition program. Ask

your nutritionists how your water supply influences the balanced diets. Optimizing water intake will help your dairy capture full nutritional value from the TMR and can equate to better dairy cattle health and performance. 🐄

References omitted but are available upon request.

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