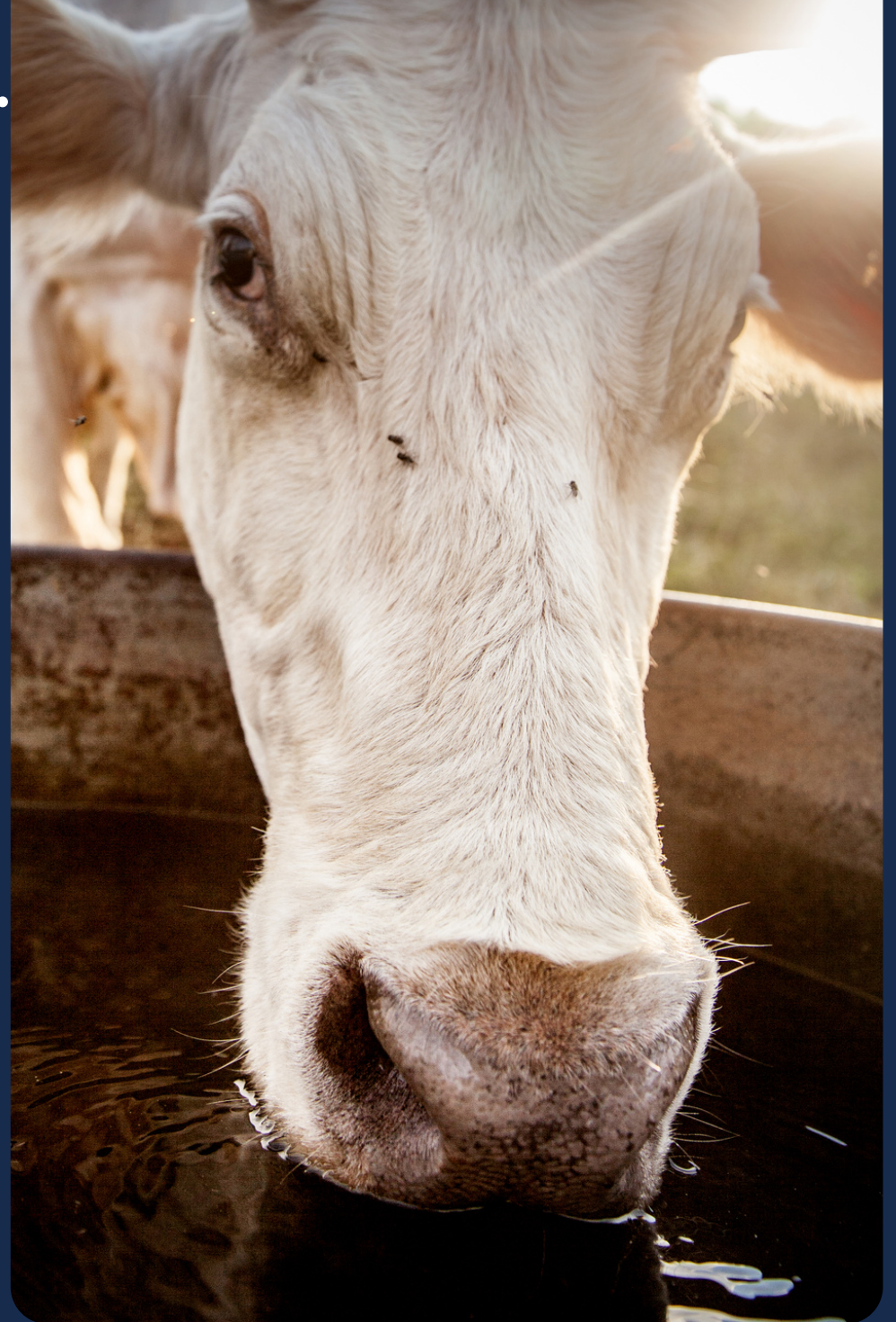

Water Supplementing For Ruminants

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DIT AgTech founder and CEO Mark Peart

In the beginning...

DIT AgTech was registered in 2007 but the story begins much earlier. In fact, the Peart name has been synonymous with water medication for over 25 years.

The Northern Territory Department of Primary Industry and Fisheries (DPIF) originally pursued the concept of water medication as a method of supplementing urea. Mr John “Jack” Peart, while in charge of Arid Zone Research, spearheaded this for three years. He and his team worked in the field to create the first electronic water medicator. Finished in 1994, they named it “**Norprim**” as a tribute to the Northern Territory Primary Industries.

Commercialisation of the Norprim was taken over by Mr Michael “Mike” Peart. Based out of Mitchell, Mike manufactured, marketed, and serviced Norprim units for a decade all across Australia. Mike was also involved in developing water medicating systems for holding yards, pens, feedlots, and even live export boats. Mike made continuous modifications and improvements to the Norprim and was highly regarded within the industry for his knowledge and expertise in water medication and broad understanding of livestock, cattle production and grazing. After Mike retired, the Norprim was discontinued.

In 2017, DIT AgTech acquired Pastoral and Feedlot Systems Australasia (PFSA), which brought all of Australia’s leading experts in water medication under one roof.

Dr Anthony (Tony) Wood QDAH (Hon) BVSc (Hon) and Mr Norm Bashford, trading as PFSA, had commercialised another water medicating dispenser — the “**Nutridose**”. Dr Wood, a graduate from Queensland University in 1965, worked as a Technical Advisor for Coopers Animal Health. Over 15 years in the role, he developed key animal health products still in use today. In 1985, he returned to private practice, focusing on animal production systems, and it was around this time that he created the Nutridose.

Under the leadership of Mike Peart’s son, Mark, DIT AgTech developed a new system called the “**uDOSE**”. Major tech advancements included satellite connectivity to enable remote control of the systems and real-time data for better oversight and decision-making. Plus improved safety features give farmers peace of mind when feeding urea. Today, more than 300 uDOSE systems are delivering supplements to over 100,000 cattle and sheep across Australia. The numbers grow every day.

DIT AgTech extends deep appreciation for the thorough research, development, and commitment of all the individuals involved.

Norprim (1994)



Nutridose (2017)



uDose (Current)



The basics

Today, Water Medication is more often called "Precision Water Supplementing".

It involves the delivery of precise doses of supplements to livestock through their drinking water.

Precision supplementing systems differ from liquid nutrients in that the supplements are injected automatically into the water line and then onto troughs rather than having to be manually administered.

Advantages

Easy distribution. Water supplementing systems can distribute minerals and vitamins directly through an animal's water supply, removing the need for the manual distribution of lick blocks.

Consistency in intake. The intake of supplements from lick blocks can be inconsistent, as it relies on the animals' propensity to use the block. Alternatively, adding supplements to the water ensures a more consistent intake of the necessary nutrients.

Reduced labor. Automatic systems minimise the tedious task of physically checking and replacing lick blocks. The systems are programmed to release the necessary amount of supplements into the water supply. They can also be controlled remotely.

Precision and control. Water supplement systems can allow for more precise control over the quantity and mix of supplements that each animal receives. This can be particularly useful if specific animals need different supplements, or if their needs change over time.

Monitoring. Advanced systems might also include features to monitor the consumption of water and supplements, giving valuable insight into the health and nutrition status of livestock

Less handling and stress. Water supplementing eliminates need of direct animal handling or injections, reducing stress on animals and freeing up time.

Preventative health management. By ensuring a consistent and appropriate nutritional intake, water supplementing aids in preventing health issues, which might otherwise require costly and labour-intensive treatment.

Limitations

Infrastructure requirements. A reticulated water system is necessary for water supplementing to work effectively. This could be a challenge on properties with a lot of ground water or lacking a reliable water supply.

Set-up costs. The upfront cost of installing a precision water supplementing system could be higher compared to traditional supplementing methods.

Water quality. Poor water quality or high mineral content can impact the effectiveness of certain supplements, potentially requiring additional treatments to the water before supplementing.

Role of water supplementing in rumen nutrition

The unique advantage of precision water supplementation is that it allows you to deliver a target dose of supplements to stock.

In this section, we'll cover how this method simplifies and improves supplement delivery to solve common livestock nutritional issues.



Supplementing for protein deficiency

When drought begins or after first frosts in a normal season, pasture grasses quickly lose protein. They provide enough energy for cattle to survive, but the protein deficiency leads to weight loss. This reduction in protein is first noticeable in the cattle's faeces, which become mounded, quickly dry, and are highly visible across the paddock. When this happens, it's time to introduce a protein supplement.

Urea is a cost-effective protein source for farmers to sustain production during low-protein periods. A 400kg cow needs approximately 35g of urea daily. But be cautious, urea can be toxic to livestock. Unadapted ruminants can show toxicity signs with as little as 0.2 to 0.5 g urea/kg body weight (BW), while adapted animals can tolerate up to 1 g urea/kg BW. (Lieske & Volmer, 2003).

Water supplementing systems offer a precise and safe method of delivering urea. The systems track a mob's water consumption, enabling dose adjustments. Systems like the DIT AgTech uDOSE have extra safety features: they monitor water conductivity, indicating the urea level. If this level exceeds safe limits, the system shuts down and alerts both the farmer and the DIT AgTech team in real-time.

Boosting phosphorus intake

Phosphorous, as the costliest element for cattle feed, should not be wasted. Using a water supplementing system to deliver phosphorus ensures the target dose reaches stock without getting eaten by native wildlife, trampled, or washed away.

The right dose of phosphorus is calculated based on the difference between what pasture and water provide and the animal's needs.

Much of Australia, especially the northern region, suffers from severe phosphorous deficiency. This deficiency can lead to multiple issues such as reduced fertility and weaning weights, bone chewing, and botulism. Studies have proven that supplying adequate phosphorous can boost fertility in deficient cattle by up to 20%. Phosphorous should be administered alongside nitrogen.

Improving animal welfare during weaning and transport

Animals may stop eating during stressful periods but will typically keep drinking. Providing a welfare supplement, generally a formula containing magnesium and dextrose, via a proportional dosing system into livestock drinking water ensures effective stress management. This method eliminates the need for handling or injections, further reducing stress on livestock.



Balancing trace element intake

Trace elements are chemicals required in very small amounts for correct physiological and biochemical functions in organisms. Animals cannot produce these themselves and must obtain them from food. The main trace minerals required by Australian livestock include Copper, Cobalt, Zinc, Selenium, Manganese, and Iodine. Cattle, sheep, and goat diets most commonly lack in Copper, Selenium, and Cobalt.

Using a precision water supplement system, you can provide your livestock with the target daily dose of these crucial trace elements. Proper trace element intake significantly enhances rumen health, wellbeing, and overall performance.

Detoxifying forage sorghum

Sorghum contains prussic acid, a toxin potentially harmful to livestock. Ruminants usually neutralise this toxin with sulphur. However, forage sorghum often lacks enough sulphur, causing animals to deplete their reserves and risk prussic acid poisoning. A precision water supplement system can enable you to deliver a target dose of sulphur to livestock, ensuring your animals have a continuous supply of sulphur during high demand periods to keep their rumen microorganisms active and promote normal cellular metabolism.

More protein for stock grazing mulga

The tannins found in mulga leaves prevent ruminant microbes from accessing all the available protein. Polyethylene glycol (PEG) is a substance that can be fed to ruminants to help break these tannins down. Using a precision water supplement system, you can accurately deliver PEG to your mulga-grazing livestock. This process makes more protein available, thereby improving production rates.

Preventing bloat

Bloat often arises from fast-growing lucerne and legume pastures. A preventive treatment, called bloat drench, can manage it. The drench can be delivered to stock via a precision dosing system. This allows continuous grazing on valuable pastures with minimised bloat risk, labor, and stress. Treatment can happen without anyone being physically present.



uDOSE supplement delivery system

How it works

1 Define Goal. Determine what limiting nutrients you'd like to address and choose a supplement formulated for the job. (See the DIT AgTech [supplement range](#)).

2 System Installation. Install the uDOSE system at the water source such as a bore head or dam. The system includes: a manifold consisting of a water meter and injection point which gets installed into the water pipe; the uDOSE unit; a conductivity probe; rain gauge; supplement tank; and solar panel.

3 Precision Dosing. The water meter reads the passing flow and sends a signal to the uDOSE, which injects the specified dose of supplement (i.e. 60ml dose every 30 litres of water) into the water pipe.

4 Streamlined Delivery. The 'supplement-charged' water can be delivered to one or multiple holding tanks, or one or multiple troughs.

5 Remote Control. 24/7 Satellite connectivity means you can start, stop, and tweak dose rates from your mobile device, wherever you are.

6 Management Dashboard. See real-time info on the uHUB dashboard, including water flow, consumption stats, and cost analysis. Get alerts in case of water leaks, safety warnings, or if your supplement supply is running low.



Installing a uDOSE at Lucknow Downs Station

uDOSE system set-up

Water supplementing systems work best when a property has reticulated water infrastructure. Many customers install their systems at the main water source such as a bore or dam. The uDOSE system injects precise doses of supplements straight into the main water line, which could feed into a holding tank or straight to a network of troughs. However, if you only need to charge one trough with supplements, for instance a trough in your weaning yards, you can install a uDOSE system at that particular trough.

Troubleshooting common problems

uDOSE systems are built for Australian agricultural and climatic conditions. They're designed to withstand outdoor exposure for many years. However, like with any tech, occasional malfunctions can occur.

The most common issue occurs when systems are turned off for extended periods. Air accumulates in the pipe and can disrupt or prevent the release of initial doses when switched back on. If your system is offline for over a week, ensure to prime the system to release any trapped air before turning it on. You can easily do this by pressing the 'prime' button in your uDOSE Controller App.

If you encounter any problems or have any concerns, don't hesitate to reach out to our team for assistance.





Water quality considerations

Water quality plays a vital role in the successful application of water supplementing systems for ruminants, especially when dealing with urea. Introducing urea directly into any water source can be risky, as it can quickly dissociate into ammonia, especially in bore water with high total alkalinity. This reaction can result in the release of ammonia gas, wasting valuable nitrogen and discouraging livestock from drinking due to the unpleasant smell.

Therefore, before installing a water supplementing system, it's essential to conduct a thorough analysis of the water source, particularly focusing on its pH and total alkalinity. These measures give an indication of the water's buffering capacity, its ability to neutralise acid and resist pH fluctuations.

High alkalinity water can accelerate the breakdown of urea into ammonia, which can be mitigated through acid stabilisation. One of the effective ways to stabilise urea is by using Urea Phosphate, a strong acid that buffers against bore water's alkalinity, provides nutritional benefits, and is fully soluble. However, balancing the required urea phosphate with the cost is crucial to ensure both the efficiency and economic viability of the supplementation system. A chemical analysis of the bore water source should be performed in consultation with professionals to determine the necessary amount of urea phosphate.

Case Study: Lucknow Downs

Phosphorus-deficient land and inefficiencies of traditional dry lick were making it hard for the Reddan family to maintain the nutritional needs of their cattle.

 Jack Reddan & Family

 1,000 breeders

 Maranoa Region QLD

 75% buffel grass, 25% native pastures

 520mm av annual rainfall



"Some animals were eating too much lick, some too little, and some not at all," says Jack Reddan.

"We would usually only start supplementing when it started to dry out and we noticed deterioration in our cattle. But by then, it's too late."

Looking for a way to improve supplementation results and get more value for their dollar, they decided to try a uDOSE system.

"Since installing the uDOSE systems, our calves, breeding time, and weaners are better than what they used to be. They seem to have more bone structure. You don't get those five or six light cows in a mob that are doing it tough. Our cows consistently look the same, have a shine in their coat, and look healthy."

Through his uDOSE systems, Jack feeds DIT AgTech's phosphorus-rich uPRO GREEN supplement most of the year, and switches to urea-based uPRO ORANGE in bad pasture conditions.

[> Read full story](#)

Case Study: Rocklands

Acquired in 2016, Rocklands Station is Paraway Pastoral Co's largest cattle breeding operation. Manager Ben McGlynn deployed DIT AgTech uDOSE systems to improve production gains and reduce labour costs.

- 👤 Rocklands Station
- 🐮 22,000 breeder herd
- 📍 Camooweal QLD
- 💧 397mm av annual rainfall



Rocklands sits on the border of Queensland and the Northern Territory, on the Barkly Tablelands about 7km from Camooweal. The station runs a 22,000 breeder herd consisting of a crossbred base with a heavy influence of Brahman cattle.

Manager Ben McGlynn deployed DIT AgTech uDOSE systems to tackle inconsistency in herd health and improve production gains.

He was also keen to reduce the labour costs and wear on the station's equipment and vehicles from tedious and ineffective dry lick runs.

➤ [Watch interview](#)

Innovations and future trends



Much has changed since the days of the 'Norprim' water medicator.

Back then, farmers had reason to be concerned about the reliability of automatic water dosing, since once you put a doser in a field and walked away, there was no knowing what was going on. Some farmers lost cattle due to overdosing of urea. Many farmers lost faith in water medication all together.

But all these learning have gone into making uDOSE systems the durable and reliable machines they are today. **Let's take a look at some of the major advancements and the technology that's on the horizon...**

Now

Data networks

uDOSE systems use satellite technology to provide farmers with real-time information and control over supplement delivery. DIT AgTech is further improving doser-farmer communication by transitioning to the NextG and Starlink networks to ensure continued reliability and cost-effectiveness for our customers.

Telemetry

Advanced telemetry provides invaluable insights into livestock habits, stock movements, and seasonal effects. Farmers can access daily, weekly, or quarterly data, reducing time spent on manual monitoring. This tech also aids in early detection of water or supplement leaks.

Conductivity probes

To ensure livestock safety and optimal supplement delivery, uDOSE systems are equipped with conductivity probes. These critical tools verify the correct supplement dosage, protecting livestock from potential toxicity.

Balancing urea levels

uDOSE systems are equipped with precision pumps and monitoring features that ensure accurate intake of urea. A carefully managed increase in urea can effectively raise grain protein content by up to 3.5%. This precision in supplementing offers farmers peace of mind, ensuring the right dosage for optimal livestock health and productivity, while minimising any risks

Custom formulations

In 2023, DIT AgTech launched a research lab in Townsville to analyse pasture, dung, and blood samples for customers. Using the information gained, we can determine deficiencies and production inefficiency, and recommend supplement formulations to address the specific needs.

Next

Exploring new supplements: uPRO BLUE and beyond

In 2023 we were excited to announce the introduction of a new supplement, uPRO BLUE, enriched with a methane reducing ingredient called Agolin.

However, our exploration doesn't stop here. In collaboration with CQ University, we are actively researching the potential for delivering diverse methane reducing additives through livestock drinking water.

This ongoing effort is focused on optimising livestock health and productivity, while reducing the environmental footprint of agriculture.

Easy carbon accounting with auto data capture

Recognising the importance of sustainability in livestock farming, we are working on integrating an automatic carbon accounting feature into our dosers. With this upgrade, farmers feeding methane reducers to their livestock will be able to effortlessly capture relevant data. This data can then be used to apply for carbon credits, fostering environmentally conscious farming practices while offering potential financial benefits. This feature is part of our commitment to contribute to the fight against climate change and to support farmers' sustainability efforts.



Getting started

Every day, over 100,000 head of Aussie cattle and sheep get their target dose of nutrients through DIT AgTech's uDOSE water supplementation systems.

Australia's largest livestock stations are using uDOSE to take the guesswork and grunt work out of supplementing.

Join them today to unlock your mob's full potential and keep production moving forward.



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