Using phosphorus supplementation for improved cattle performance and self herding

Producer Case Study, June 2021

Photo: Harry & Alys McKeough with their cattle

At a glance

Owner & location

Harry & Alys McKeough
Carey Downs station, Upper Gascoyne region, Western Australia

Property size

179,000 hectares

Pastures & soils

Native pastures and shrubs, with some Buffel grass in the river system country.

Average rainfall

200 mm

Cattle enterprise

1500 cattle including 700 – 800 Droughtmaster breeders.

Target market

Store cattle to live export and feeder markets, cows and older male slaughter cattle are sold to southern processors.

Background

Harry and Alys McKeough bought Carey Downs Station in the upper Gascoyne region of Western Australia 11 years ago, moving from a farming property further south. The 179,000 hectare station is made up of sandy plains / pindan (red soil) country in the in the western half and stony hills with creeks and major river systems in the east. The pastures include native grasses, shrubs, and some buffel grass is present along the river systems. The McKeough's run approximately 1500 Droughtmaster cattle including 700 to 800 breeders, with year-round mating. Their young cattle are usually sold as store cattle into live export and feeder markets and cows and male slaughter cattle are sold to southern processors.

The 200 mm annual rainfall was described by Harry as "*extremely unreliable*." He explained "*we don't have any defined wet season. It may rain anytime in the first half of the year. Historically it's half summer and half winter rain, although it can be anything or nothing.*"

Alys and Harry described their property management goal as "*to run a sustainable beef herd, turn off good quality beef and constantly improve our country and to not go broke.*"

Involvement with Future Beef

The McKeough's subscribe to the FutureBeef eBulletin and enjoy reading the articles to keep up-to-date. Alys described accessing and using tools on the FutureBeef website including Breedcow and Dynama and following links from articles to Long Paddock and MetEye.

Harry and Alys have participated in FutureBeef webinars including one on phosphorus supplementation. The information from that webinar aligned with their current practice of providing phosphorus supplements to their cattle. Harry said the webinar encouraged him, and whilst he may not consider he learnt new information, it provided confidence in his practice - *"It was great to know I am on the right track."*

Phosphorus supplementation

Phosphorus deficiency is common in beef herds in northern Australia often due to low soil phosphorus levels. It leads to a loss of appetite resulting in lower protein and energy intake and poor condition and deficient cattle may chew on bones and other objects.

Carey Downs station is mostly deficient in phosphorus and supplementing with phosphorus was not something Harry was familiar with until they bought the station. He explained, "*When we first came here, things were very bad, the station was experiencing its third year of well below average rainfall and we only had a handful of cattle. The previous owner gave us the recipe for a urea lick which had phosphorus in it. I didn't really know much about phosphorus deficiency, so we were just using it for the urea to keep the cattle alive. When it finally rained, we bought cattle and even though there was reasonable feed about, there were some lactating cattle that were poor and we were finding bones in toughs, as the cattle were chewing bones."*

This led Harry and Alys to research phosphorus supplementation by reading articles sourced through FutureBeef and the Department of Primary Industries and Regional Development WA and seeking professional advice. They worked with a ruminant nutritionist and a vet to develop a dry lick for the property. "*We started making our own loose mixes. We developed it with a vet, based on what our cattle need so it is quite specific for our area. It is a different way of doing it as it's not an off the shelf product"* said Alys. She went on to explain that *"Over time we have changed how we use licks, the amount they get and the uptake from the cattle has changed as well. They go looking for it now, which they didn't when we first started."* Harry explained phosphorus supplementation is now *"a constant part of our management, we are supplementing 12 months of the year and the cattle always have access to phosphorus, although when there is green feed, the cattle will not seek out the lick."*

The McKeough's have used soil testing to monitor phosphorus levels across the station and this was undertaken in conjunction with a fertilizer company. Harry explained *"It confirmed that our sand plain is very lacking, and it did tell us that our creek systems are not as lacking."* Harry has been able to adapt his dry lick formulation for when his cattle graze on the sand plain where he adds more phosphorus to the lick and explained that they "*consume more of it as well."*

Faecal testing was used in 2018 to assess phosphorous levels of the cattle on the phosphorus supplements. The testing was undertaken in the dry season with mostly dry cows in the mixed age herd. It involved collecting fresh dung samples from as many different animals as possible, bulking and drying the dung before sending it to a laboratory in Queensland for analysis. It was recommended from the results that the phosphorus level in the dry lick be increased to improve protein utilisation from the grazed pasture and forage.

Visual assessment of the cattle and an absence of bone chewing has led Harry to conclude their supplementation program is working. Harry explained *"The bone chewing stopped as soon as we started supplementing with phosphorus. We didn't find bones in the troughs anymore or see those woody looking lactating cows like we used to."*

Making phosphorus licks on-station

Harry produces his own dry lick on the station. After initially mixing it using a cement mixer, they have invested in upgrading their machinery to streamline the process. Harry described how this involved "*Using concrete bunkers and an eight cubic metre concrete agitator to make it in and a bagging plant."*

The lick is formulated for the season as Harry explained "*The cattle don't touch the lick in wet conditions when there is green feed. In the early dry conditions, we add lupins to the lick as an attractant to get them onto it as soon as possible once the green feed starts to disappear."* The lick is formulated to contain 3.6% phosphorus. The lick is made up of 50% salt, ~30% ground limestone and gypsum, ~19.5% dicalcium phosphate and 0.5% feedlot mineral mix. In the dry season urea is also added to the lick to improve dry feed utilisation. Harry described the challenge is limited access to phosphorus sources in Western Australia. He is currently using dicalcium phosphate sourced from China as the phosphorus ingredient for the lick and has previously used mono-dicalcium phosphate from Darwin.

The lick formulation is also changed for different areas of the property "*depending on the water and the country*." Harry explained *"The salt is the main attractant that gets them to eat it. In areas where the water is not so good, we have been adding crushed lupins and cutting out the salt as the attractant. We change the brew to try to get them to eat their 200g a day of the total supplement and 50-60 grams of urea."*

The licks are fed as a loose mix in 1000L IBC pods (see pictured right)*. "We cut the side out to keep the rain off, so the urea doesn't get wet, and it seems to work a treat",* said Harry.

Impacts and benefits of phosphorus supplementation

Phosphorus supplementation has had positive economic and productivity benefits for the McKeough's, "*It has improved our bottom line,"* said Harry. They have less losses than they used to, the productivity of the cattle has increased and Alys described how they are now able to turn off "*nice looking cattle. They are shiny and healthy and for pretty marginal country, we are able to fatten cattle here in most years."*

Production of their own customised lick on station has been economically beneficial, costing approximately $800 per tonne or about $0.17 per day. Harry estimates buying a similar off the shelf product would likely to be around $1100 per tonne.

In addition to the productivity and economic benefits, a big benefit of the phosphorus licks has been the ability to use them as an attractant for self-herding and to improve their ability to muster and move the cattle.

Photo: Cattle feeding on dry lick from the IBC pod

Self herding

The practice of self herding was developed by researcher Dr Dean Revell and NSW sheep producer Bruce Maynard and involves allowing animals to become familiar with signals and attractants that can be used to guide their movement. The McKeough's worked with Dean and Bruce to begin trialling self herding at Carey Downs Station in 2014. Alys explained after completing their trial in 2017 they have continued to use self herding and *"haven't really stopped since then."*

Harry described their approach to self herding, "*Supplements can be habit forming for cattle once they get used to it and as there is very little fencing on Carey Downs station, we use self-herding to manage the movement of our cattle. The loose licks are a major part of that as well as using lick feeders with lupins."* Alys went on to explain *"we move all the attractants around so that they are not in the same place all the time. So they [the cattle] have to go to it [the lick] rather than it being at water where they know where it is."*

The feeder is moved about half a kilometre during water runs and bells and whistles are used as a signal to help the cattle find the feeders in the scrub*. "Every time I cleaned out a feeder, I used to get the old umpire whistle out and give it a blow and the cattle would come running out of the scrub"* explained Harry. *"We use it as a tool for mustering. We trap the bulk of our cattle by using self herding, we can move 95% of our cattle from one water source to another."*

Benefits of self herding

Harry described the benefits of self herding for mustering*, "It has given us management over our cattle without fences and is streamlining the trapping process. You can shift all the cattle into one area without having to trap the whole property and you can cut the workload in half if you do it properly."*

The McKeough's have signed up approximately half of their station (~90,000ha) to a carbon farming project. Self herding is a key part of their methodology to enable them to control their grazing for the project. Alys explained, "*We have signed up to the human induced regeneration project. You can still run cattle under the human induced regeneration. We will use the self herding grazing management to allow the shrubs and trees to grow over two metres.* The human induced regeneration method for carbon farming involves changing the way livestock are managed, reducing feral animals and weeds to help native trees regrow to above two metres (2m) in height with 20% shade cover. "*Running cattle will help with the undergrowth, prevent fires and will stimulate the earth. Human Induced regeneration is about looking after what you have got through your management."* described Alys*.*

Photo: Harry McKeough with his cattle

Take home messages

Harry's advice to other producers is "*For phosphorus, if your country is lacking it, it would be one of the cheapest things and the best return for dollar that you could possibly do."* He also explained the flow on benefit of this as *"Once you've got them on the licks it's a fantastic tool for self herding and for generally quietening the whole herd."*

For those interested in producing their own phosphorus dry lick, Harry advised the importance of having the right equipment and seeking advice to get the formulation right. He explained *"If you're not set up to do it with decent machinery, you are probably better off buying the packaged product, as it's a painful process to do it in a cement mixer."*

Summary

The success of phosphorus supplementation at Carey Downs Station is a result of good research, seeking advice, willingness to try new things and adapt practices to suit the needs of the cattle. Harry and Alys now consider phosphorus supplementation an essential part of their cattle management program and ensure their cattle always have access to it. The flow on benefits has enabled the dry licks to be used as tools in self herding and has led to better mustering, ease of cattle movement, and improved grazing management, a win-win for the cattle and the country they graze.

This case study was prepared by Sophie Folder of Pear Consulting for the 'A review of user satisfaction with FutureBeef communication tools and impact on practice change' project for the Queensland Department of Agriculture and Fisheries. The author acknowledges the contribution of Harry and Alys McKeough to this case study and thanks them for their willingness to participate and share their story of change with others.