University of Adelaide trial

2021

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BSC (HONS) ANIMAL SCIENCE

Improving the sustainability and profitability of the livestock industry

BEACHPORT
LIQUID MINERALS
livestock supplements

CONTENTS

Increase profitability through improving the health and performance of your herd

Beachport Liquid Minerals was founded in 2006 and since that time the effectiveness of our products has been anecdotally proven by livestock producers throughout Australia. Our liquid supplements were developed in the paddock, not a laboratory, drawing on the experience and knowledge of Australian livestock producers.

The product range has been developed for yearly supplementation, to help improve overall production for cattle, sheep, goats and horses. We also have a product to help manage stress situations in livestock management programs.

From Beachport's inception, our three key aims have always been to:

- Produce a product that works like an injection without having to yard;
- Deliver through the water supply, but not on a daily basis;
- Improve productivity in all facets of animal management.

To support the results enjoyed by clients as well as our internal development trials, in 2021 we began trial work with the University of Adelaide.

The trial's purpose was to test how effective our unique formulation of trace elements, amino acids and electrolytes are in improving weight gain and maintaining adequate trace element levels in the bloodstream, when dosed via the water supply.

There is no dispute in the industry how important trace element supplements are in ruminant health and production. However, Beachport also proves that combining amino acids and electrolytes has the potential to increase production even more.

Our water application method was the focus of this trial to scientifically prove its ability and efficiency to deliver our product into the bloodstream.

Our supplements are absorbed via the small intestine into the bloodstream and can last in the system for up to six weeks. With just one dose over three days in the water trough using the Beachport Dispenser, this is much easier and more effective than traditional supplementation methods.

The results from this trial prove Beachport's products and delivery method are just as effective as yarding and injecting.

This gives producers the opportunity to leave the animals in the paddock, which also decreases stress on both them and their livestock.

The exciting and indisputable results in this summary prove that Beachport is an effective supplement for not only trace element levels, but weight gain and lowering cortisol levels. Most importantly, the trial results prove the effectiveness of our water supply delivery method, which saves producers time and money, has significant animal welfare benefits and is more sustainable than traditional supplementation alternatives.

Kym Sutherland
Beachport Liquid Minerals founder and 4th generation livestock producer

University of Adelaide trial

"Is the addition of a trace element and amino acid supplement to the water supply beneficial to Angus steers?"

This trial was conducted for Beachport Liquid Minerals at the University of Adelaide's School of Animal and Veterinary Sciences Roseworthy campus.

TRIAL GOALS

Trace element efficacy
Is Beachport Liquid Minerals an efficient and cost effective trace element supplement?

Improve daily weight gain
Does using Beachport improve weight gain and profitability?

Water dosing efficacy
Is using Beachport via the water as efficient as an injection? Does it stay in the bloodstream?

80 ANGUS AND MIXED BREED STEERS

We obtained 80 steers from Four Winds farm on Flinders Island off Tasmania and transported them to the University of Adelaide's Roseworthy Campus, arriving on 21st June 2021.

While on Flinders Island, the steers were randomly allocated into two groups:

1. **Control group (n=40)**
   - Received no Beachport supplementation.
2. **Treatment (Beachport) group (n=40)**
   - Received Beachport Liquid Minerals Green Cap before transport and Blue Cap throughout the trial.

Upon arrival, the steers were randomly allocated into smaller groups of around 10 and put into feedlot yards.

Trial timeline

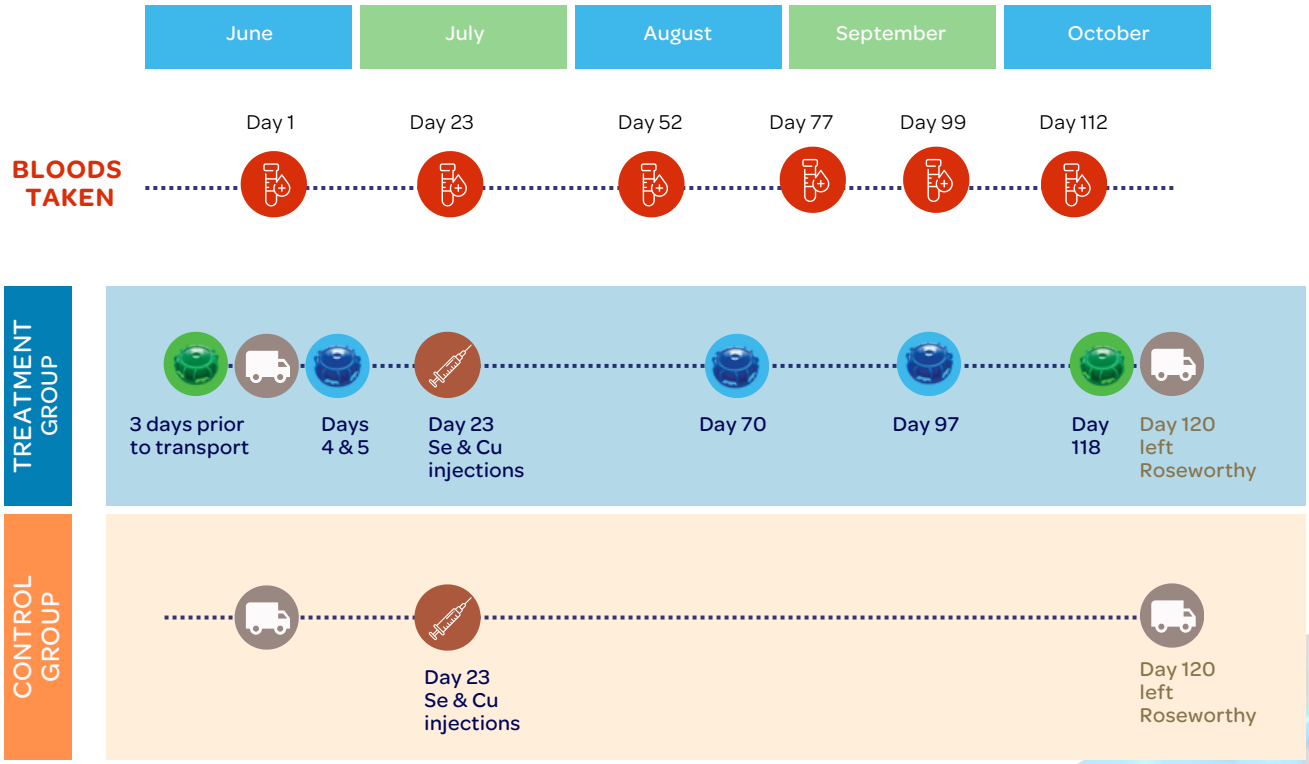
The timeline for each group outlines bloods taken throughout the trial across both groups. Bloods were analysed for selenium (Se), copper (Cu), and magnesium. Plasma cortisol levels were also assessed to monitor stress, along with pepsin and creatine kinase levels.

After the arrival, the first blood results were analysed and it was noted that both groups were deficient in both selenium and copper. It was decided that both groups would receive selenium and copper injections due to this.

This was outside the scope of the trial, but the decision to give the injections gave us some added, interesting results.

The treatment group could no longer be given another dose of the supplement when planned. This resulted in a period of approximately 65 days where the steers in this group had no Beachport Liquid Minerals in their system.

It is important to note that despite receiving the Blue Cap supplement and the injections within a month of each other, the blood concentrations of selenium and copper never exceeded safe levels.



Selenium concentration

It is clear that after receiving Beachport's Blue Cap, the selenium concentration increased in the Beachport steers, showing a statistical difference within the first 24 days of the trial.

Figure 2 shows the average selenium concentration in the blood from 21st June 2021 (day 1 of trial) to 14th July (day 24 of trial).

The Beachport steers received their first Blue Cap supplementation on the 24th June, four days after they arrived, however neither group received any selenium injections until 14th July.

This took the Beachport group from being deficient to being in the optimal range, while the control group remained deficient.

Figure 3 shows selenium blood concentration throughout the whole trial for both groups.

Selenium in the Beachport steers consistently increased from their first supplementation, while the control group's levels only started to increase after they were given the selenium injection.

Although the Beachport steers were also given injections on top of the water supplement, their selenium levels never exceeded the optimum range.

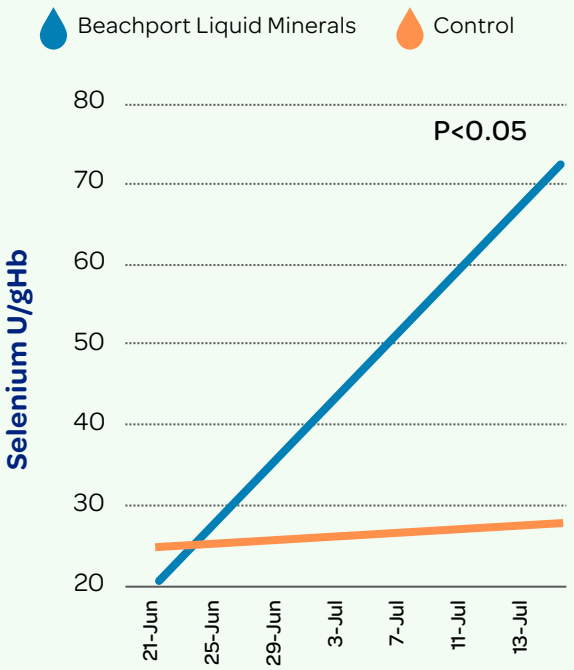


FIGURE 2

Blood selenium concentration of treatment and control group steers (optimal range 40-300 U/gHb)

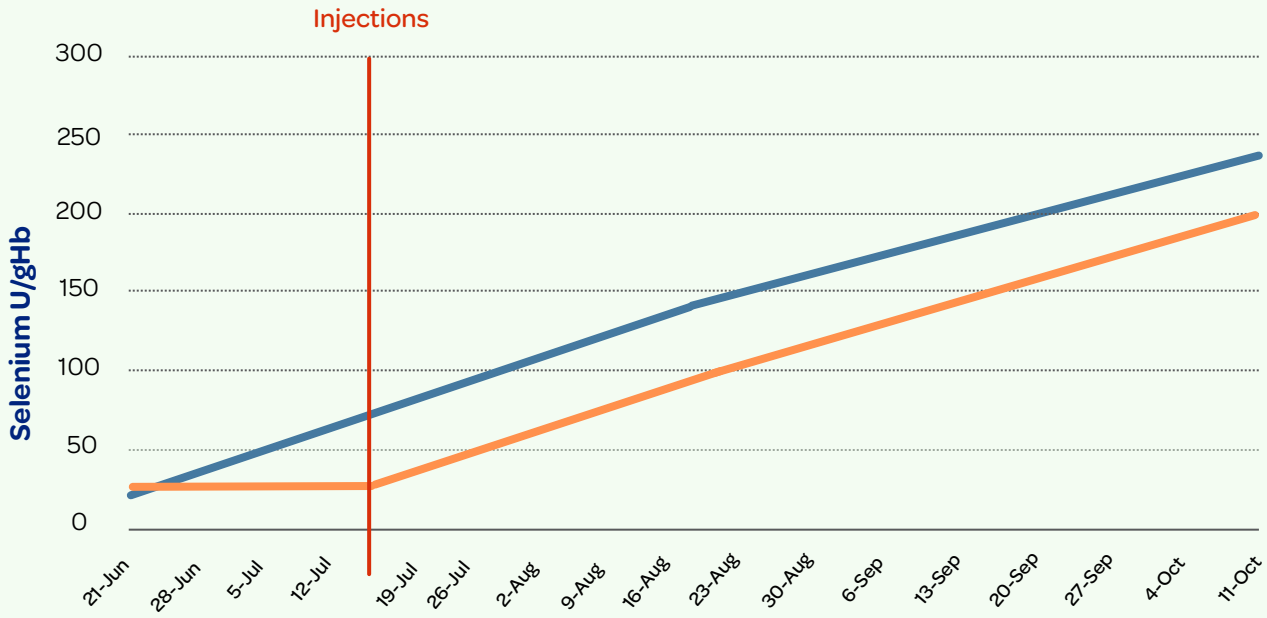


FIGURE 3

Blood selenium concentration of treatment group and control group (optimal range 40-300 U/gHb)

Beachport Liquid Minerals Control

A statistical significant difference (P<0.05) shows Beachport supplements having a noticeable effect on the results at day 23 and 99 (p<0.05) and a trend toward significance on day 112 (p= 0.0556).

Copper concentration

The graph below shows the control group had lower copper concentrations throughout the whole trial compared to the Beachport group. After the copper injections, the Beachport group's blood concentrations continued to increase, while the control group's seemed to decrease.

The blood results prove that minerals are entering the bloodstream in safe levels, even in conjunction with mineral injections. There was a statistical difference seen at day 99 ($p<0.05$).

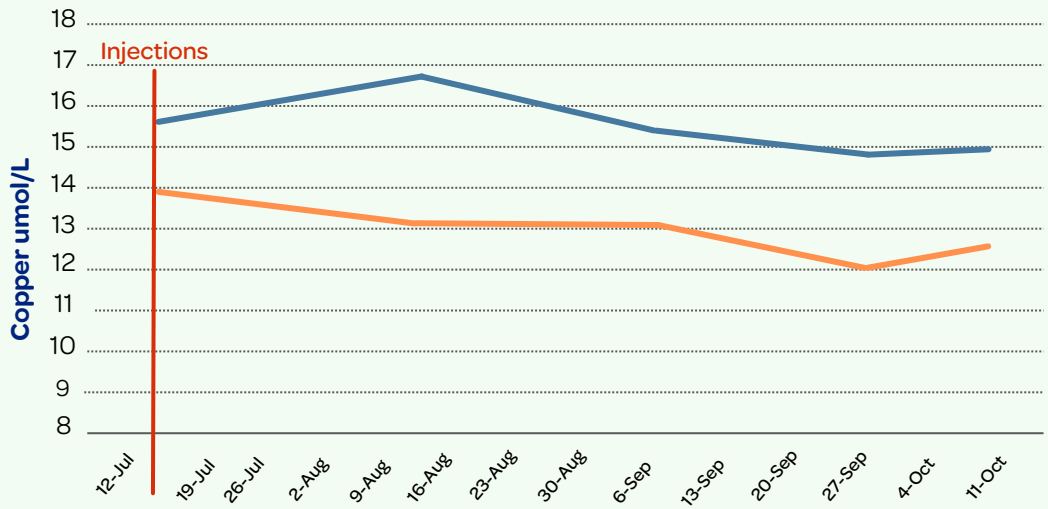


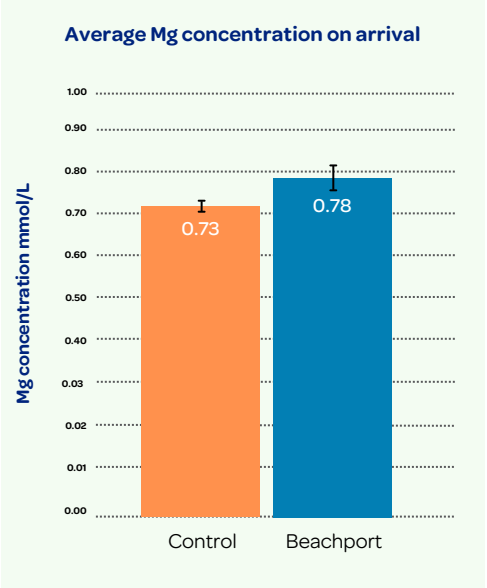
FIGURE 4

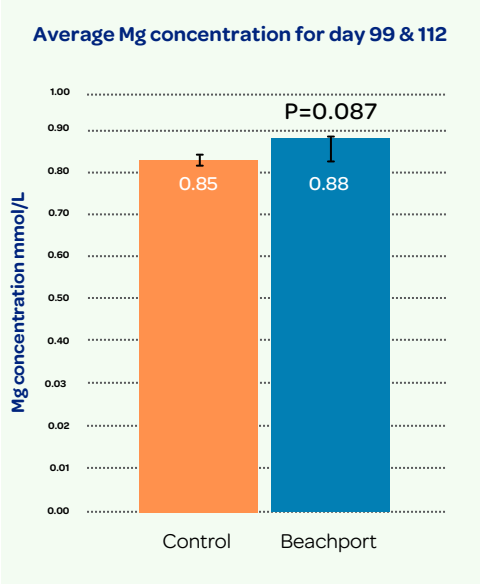
Blood copper concentration of treatment group and control group (optimal range 9-20 umol/L).

Beachport Liquid Minerals Control

Magnesium concentration

On Flinders Island, the Beachport group was given a dose of Green Cap via the water supply three days before being transported. Blood tests were then taken upon arrival at Roseworthy Campus and showed magnesium levels were higher in the Beachport group.





Only the Beachport group received magnesium through Green Cap and Blue Cap. No other form of magnesium supplementation was given to either group.

Blood magnesium concentration of treatment and control steers (optimal range 0.74 - 1.44 mmol/L)

Daily weight gain

Throughout the trial, the treatment group had a higher average daily gain than the control group, with especially significant weight gain results from Day 1 - 51.

In this period, the Beachport steers gained approximately 189g more a day than the control group steers.

When looking at weight averages over the whole trial, the Beachport steers gained an average of 174g more a day.

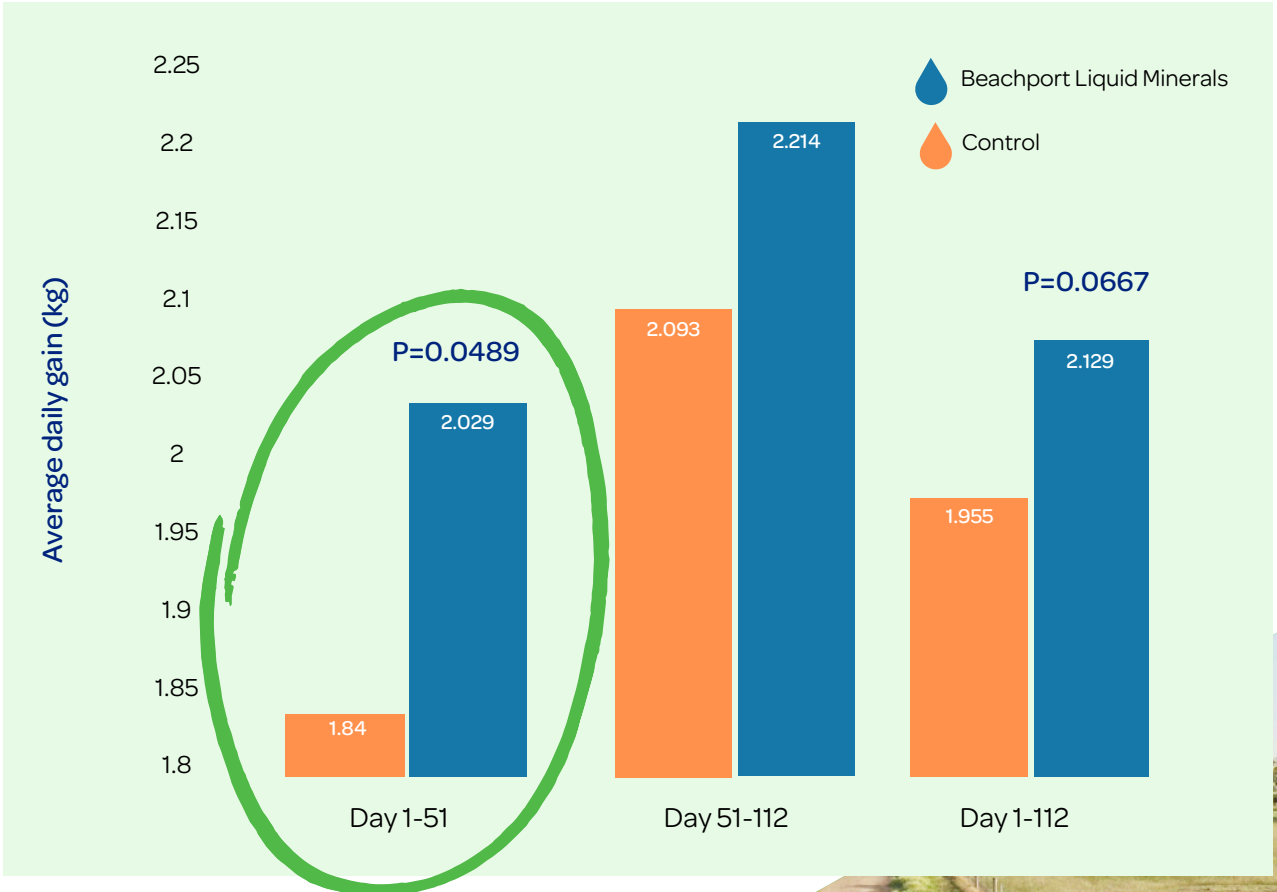
AVERAGE DAILY WEIGHT GAIN FOR THE BEACHPORT GROUP P/H

additional **189g**	additional **174g**
MORE than the control group Day 1 - 51	**MORE than the control group over the whole trial**

PRICE PAID PER CARCASS

Beachport group **$95.64**	**MORE than the control group over the whole trial**

Cost results outlined on page 7.



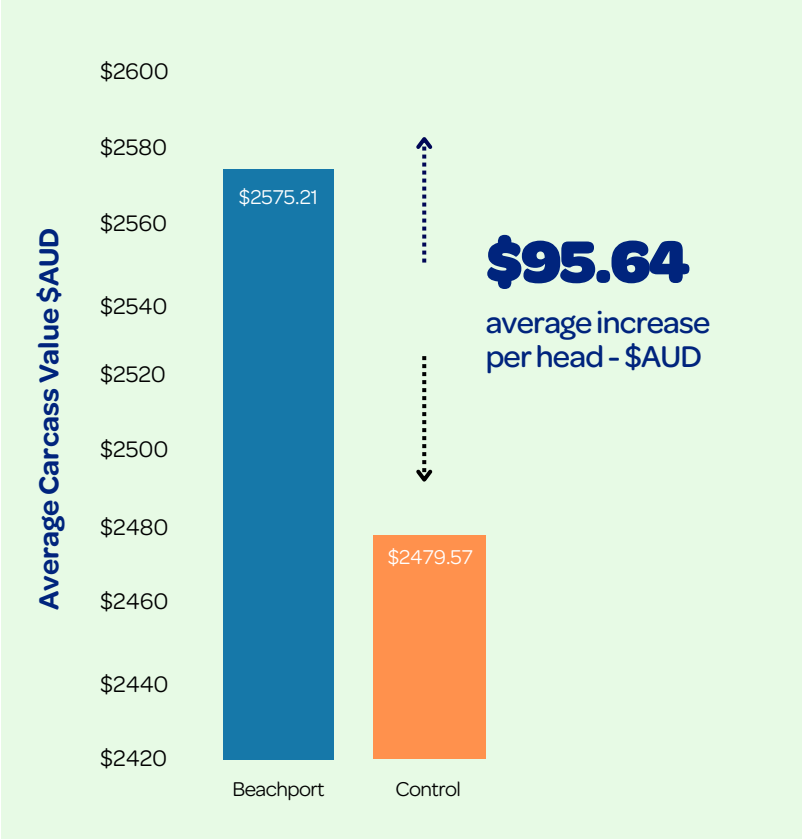
If P<0.05 = significant difference
If P-value is close to 0.05 there is a potential trend towards a significant difference between groups.

Cost results

The price paid per carcass was $95.64 more per head for the steers in the Beachport group, compared to the control group steers.

The cost per head for the whole trial was $4 for the Beachport supplements, meaning there was a profit of $91.64 per head difference.

When considering the period after the injections when there was no Beachport Liquid Minerals in the steers' blood systems, there is potential for an increase in this profit.



$4
cost per head

$91.64
profit per head

Trial goals achieved

With today's industry focus around sustainability, animal welfare and finding more cost-effective ways to achieve better health and performance in livestock, this trial shows that Beachport Liquid Minerals is a proven supplementation system and a profitable option to improve weight gain, health and performance.

Supplementation via the water supply is just as effective as an injection.

Beachport Liquid Minerals water supplements are more cost effective and can produce an increased profit.

All essential elements are maintained within the optimum levels required when supplemented with Beachport.

Amino acids and minerals are able to enter the bloodstream and are not degraded in the rumen or the abomasum.

Additional trial results
Plasma cortisol

Lower stress levels

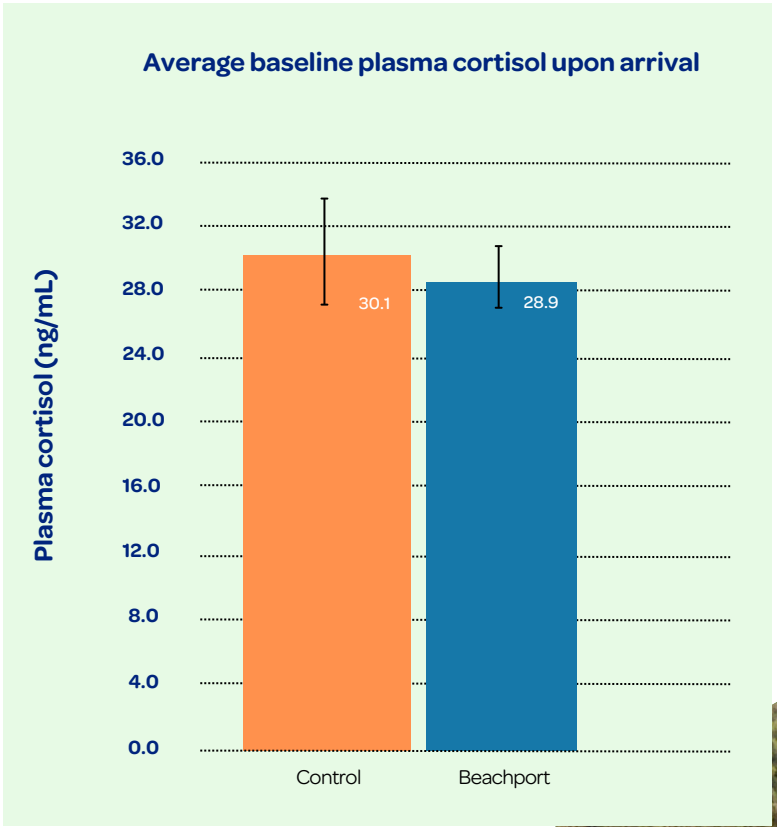
Plasma cortisol is a hormone secreted by the adrenal glands and can be an indicator of stress.

Plasma cortisol levels were recorded to assess the benefits of Green Cap, which lowers stress, and was used on the Beachport group before they were transported from Flinders Island to South Australia.

The graph below shows the average plasma cortisol collected from the treatment and control groups upon arrival at Roseworthy.

The Beachport steers had lower average cortisol levels compared to the control group. This finding suggests the control group steers may have had higher stress levels during transport and while in the cattle yards.

This lower average cortisol levels in the treatment group supports the use of Beachport's Green Cap supplement to lower stress in livestock without doping the animal.



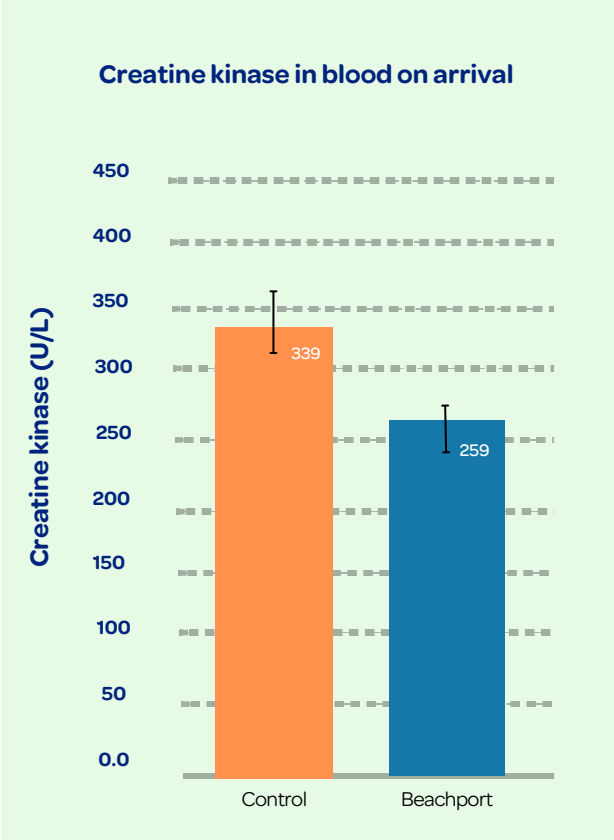
Additional trial results
Creatine kinase and pepsin

Lower risk of muscle damage and parasite burden

Creatine kinase

Creatine kinase (CK) is a muscle enzyme. Increased CK suggests leakage of the enzyme from muscle cells, often as a result of muscle inflammation or trauma. It is known to be an indicator of muscle damage or disease.

Some additional interesting results from the trial included a significant difference in creatine kinase levels on arrival, with the control group having elevated levels compared to the treatment group.



Pepsin

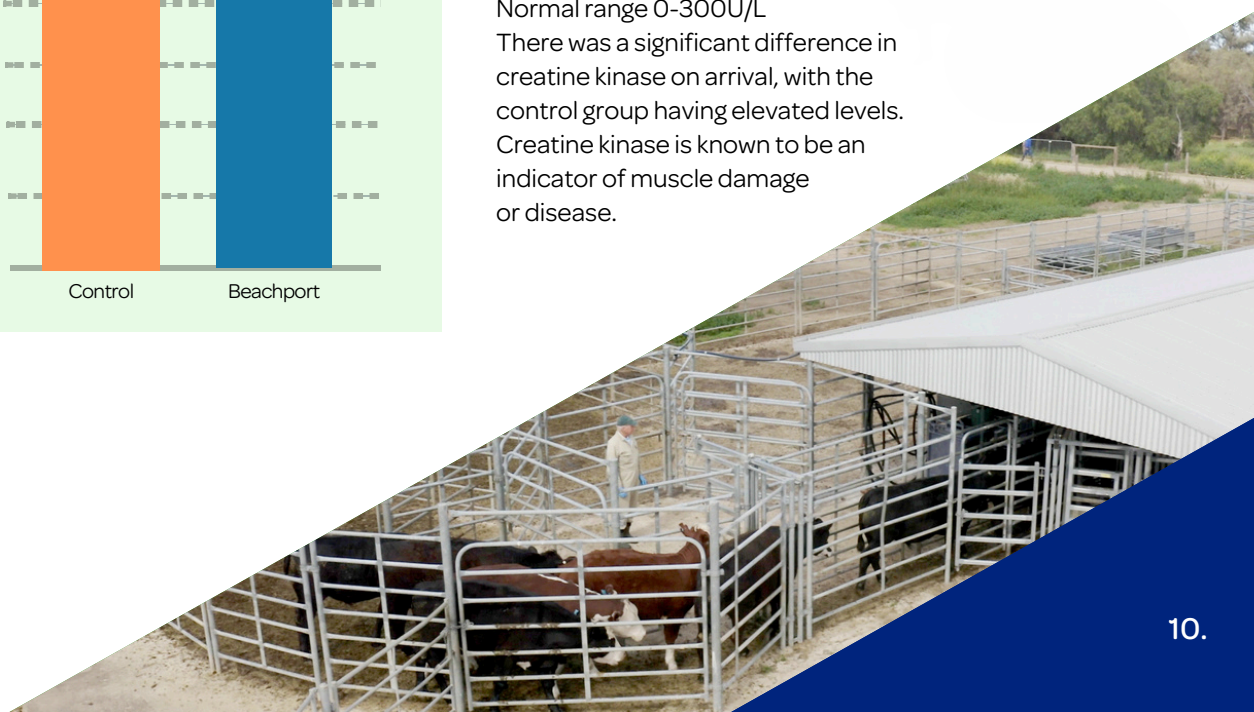
Pepsin is an enzyme found in the stomach which aids in the digestion of protein. Increased levels can also be associated with gastric mucosal damage caused by parasites.

Pepsin levels were elevated in the control group, suggesting the control group may have had a higher parasite burden compared to the Beachport group

Normal range: 0-5 (u/L)
Control group: 6.26
Beachport group: 4.11

These results support the huge benefits of using Green Cap to lower stress in livestock at key times, including before transport or weaning.

Normal range 0-300U/L
There was a significant difference in creatine kinase on arrival, with the control group having elevated levels. Creatine kinase is known to be an indicator of muscle damage or disease.



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