Demonstration of an in-paddock cattle weighing system (Optiweigh)

Irongate Wagyu, Kalgan, 2024
Metcalfe Family, Manypeaks, 2024

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Key Messages

- The in-paddock weighing system reduced the time and labour typically spent on cattle weighing activities.
- It is essential to have the Optiweigh on level ground immediately in front of where the cattle stand to enter the Optiweigh for accurate recordings.
- Herd size had very little influence over the % of the herd weighed, in any given timeframe.
- It is more likely that paddock size, the location of the Optiweigh, the nutrition status of the cattle, and the influence of the attractant has a larger influence on the % of herd weighed – and some cattle will never use it regardless!
- It appears that measuring approximately 20% of the herd in a short period of time is accurate enough to represent the whole herd.

BACKGROUND

Monitoring of cattle live weights to reach target market specifications and to assess welfare can be a labour and time intensive operation, particularly if cattle need to be brought into yards regularly for weighing. In extensive paddock environments where animals are not regularly weighed there can also be a delay in noticing changes in growth rate and body condition. In 2023, Stirlings to Coast Farmers (SCF) began a 3-year project demonstrating an in-paddock cattle weighing system, Optiweigh. The aim of this MLA funded Producer Demonstration Site (PDS) project is to utilise the Optiweigh unit on properties in Southern WA to demonstrate the value of an in-paddock cattle weighing system for improved labour efficiency, monitoring animal weights, and optimising compliance with target market weight specifications.

Optiweigh, a product developed in 2019, is a robust, portable, in-paddock cattle weighing system. It weighs the front feet of an animal when it voluntarily enters the unit in the paddock. An attractant, such as a lick block, molasses or loose lick, is used to entice the cattle to enter any time of the day. A tag reader scans the animals' RFID tag, load bars under the platform collect the animal's front feet weight, and this data is sent to the cloud, with an algorithm applied to calculate total body weight. The data is then available for viewing on the Optiweigh app on a phone, tablet, or laptop, as well as more detailed information via the Optiweigh website. Data is collected at multiple points in the day and requires no animal training or handling to collect. The second year's project data (2024) is presented below.

METHODOLOGY/TREATMENTS

Six host farmers will demonstrate the use of the Optiweigh machine on a minimum of one herd each across the three years of the project. Herd choice is at the discretion of the host farmer. Participating producers have various classes and breeds of animals, including weaners, trade cattle, cows with calves at foot, yearling bulls, and replacement heifers, and it is hoped the benefits of the Optiweigh can be quantified across a range of these different herds.

Cattle liveweight data will be gathered from the Optiweigh system and a cost benefit analysis (CBA) will be performed for each site. To produce the CBA a pre-project survey will

be conducted with producers to determine a range of costs and potential benefits linked to the implementation of in paddock weighing. A post-project survey will then be conducted to enable producers to precisely quantify the different costs and benefits they encountered while utilising the Optiweigh machine. Subsequently, the data gathered from producers will be subject to an analysis using a detailed cost-benefit assessment tool.

RESULTS AND DISCUSSION

Irongate Wagyu

Lachy Gilmore, Genetic Sales Manager and Tom Dinneen, Operations Manager, at Irongate Wagyu trialled the Optiweigh machine to see if or how it would fit in their operation. Irongate run 3500 Wagyu cattle in mob sizes of between 90-200 head. Under their current management practices cattle are weighed 15 times per year, 4 times when the cattle are yarded for other jobs and 9 times when cattle are yarded for weighing only. This amount of weight data results in the producer having good knowledge of cattle condition, often finding the actual weight of cattle to be within 20kgs of their expectations. Irongate have estimated they would have to purchase five Optiweigh machines to have the capacity to sufficiently monitor the weight of all their cattle.

Irongate trialled the Optiweigh across 3 different herds.

- Yearlings mixed sex (grazed Raphno)
- Light Heifers
- Heavy Steers

Irongate first tried the Optiweigh with a herd of weaners grazing a mixed sward that included Pallaton Raphno. For the weaners, the starting average herd weight was 173.8kg, and the final average weight was 190.1kg, resulting in a total average weight gain of 16.79kg, and a growth rate of 645g/day (Figure 1). While the weaners continue to grow throughout the whole measurement period, their growth is not linear with growth appearing to be greater at the start of the weighing period compared to the end. Figure 1 shows a flattening off of the average herd weight approaching the end of the measurement period, when it was decided to pull these animals off the Raphno and not continue grazing it with this group.

The Optiweigh was then trialled with a herd of 99 heifers confined in a 1.5 ha pen. On the day the Optiweigh was introduced to the paddock, 10 of the 11 heifers that entered the Optiweigh were over 180kg. On Day 2 throughput had increased to 24 heifers a day, with 11 recording weights under 180 and 13 recording weights over 180kg, giving a much more accurate average weight (Figure 2).

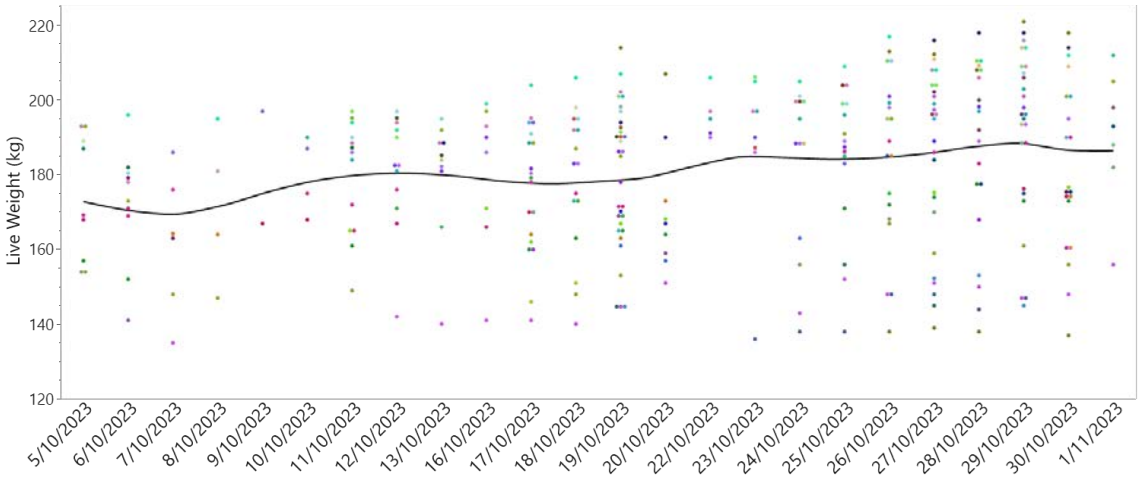

Figure 1. Weaners grazing Pallaton Raphno from 5/10/23 to the 1/11/23

The final herd to trial the Optiweigh at Irongate were heavy steers. Unlike the weaners and heifers that were out grazing in paddocks, the steers were in a bunk pen and fed a ration. Steer weights were recorded with the Optiweigh from 28th of November until the 17th of March, however from the 19th of January onwards their weight gain was not recorded accurately due to a rut forming just in front of the Optiweigh where the steers back feet stand. This caused the steer weights to be recorded lighter than they really were. However, the same trend of reduced average herd weight over the first 3 days of utilising the Optiweigh system with this group was observed in the steers (Figure 3). This is most likely due to the heavier dominant animals of the group investigating the Optiweigh and weighing themselves first.

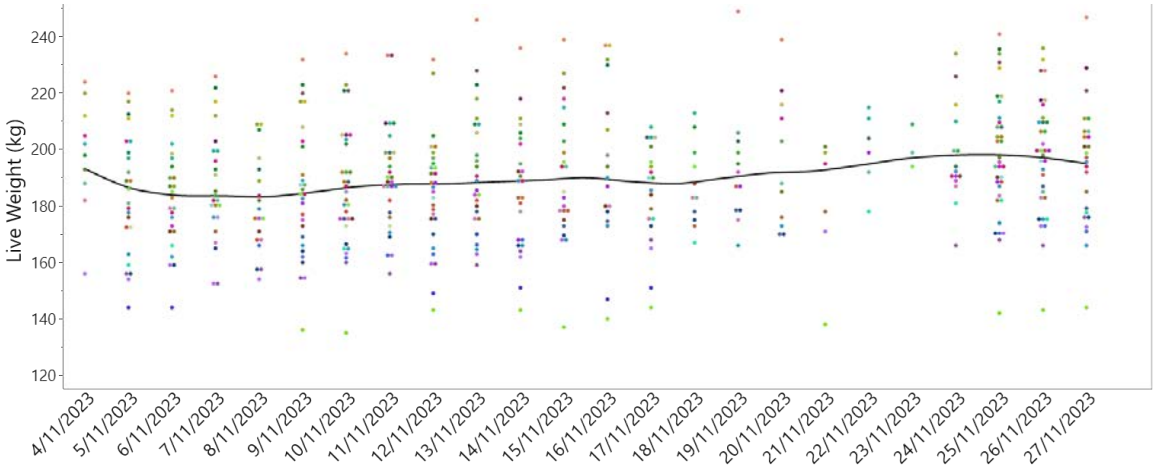

Figure 2. Yearling heifers in a paddock grazing from 4-28/11/23

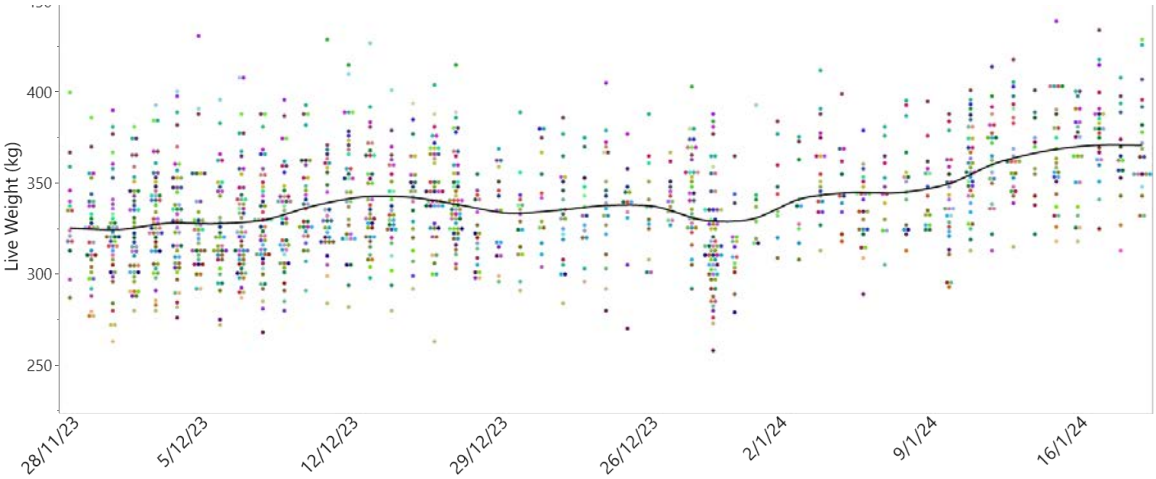

Figure 3. Yearling steers recorded average daily weights from 28/11/23 to 19/1/24.

Metcalfe family

The Metcalfe's run 5200 cattle in mob sizes of 50-200 head. Under their current management, there is a single cattle weighing per year that occurs when the cattle are yarded for other jobs and 2 weighings when the cattle are specifically yarded for weighing only. Tim Metcalfe trialled the Optiweigh in the final months of 2024 and adopted a different strategy of use than what had been previously used. While the previous host farmers have largely used the Optiweigh to observe herd weight changes over time, Tim moved the Optiweigh across many herds over a short period of time. This enabled him to establish a quick herd weight average and weight distribution to inform management decisions (such as which group of yearlings were to be sold first) rather than track a herd's weight gains over time. Once an average had been obtained, it was moved to the next herd.

From the herds observed it has been seen to be extremely unlikely that 100% of the herd will weigh themselves in the Optiweigh. Table 1 and Figure 4 show the Optiweigh data that was collected from the 10 herds over the trial time.

The number of days the Optiweigh was in with the herd was less influential than initially expected. It was expected that the longer the machine remained active in the paddock the higher the percentage of the herd that would be recorded. However, this did not always prove accurate. There was quite a lot of variation in the weight distribution, however the standard deviation, (the average difference in weight each measured animal is to the mean) is relatively stable across each herd, indicating that the machine is taking representative readings across each herd (Figure 4).

Table 1: Optiweigh data collected from 10 herds on the Metcalfe Property

Herd Name	Head	% of herd weighed	Days	Average Weight	Min Weight	Max Weight	Standard Deviation
Canola Steers	129	20	12	417	359	469	28.70
Mount Pleasant Steers	130	32	11	473	381	554	37.65
Bremer Big Steers	190	17	7	490	442	559	28.94
Bremer Small Steers	269	33	16	406	356	456	25.33
Bremer Heifers	105	45	8	452	382	538	35.93
Pivot Steers	180	42	10	468	326	553	36.77
Duckflat Yearlings	105	45	6	474	386	531	31.12
Rushes Mix	50	36	14	485	340	547	31.12
Bremer Heifers	119	29	7	481	411	549	35.9
Campbell Steers	107	41	11	464	407	493	34.82

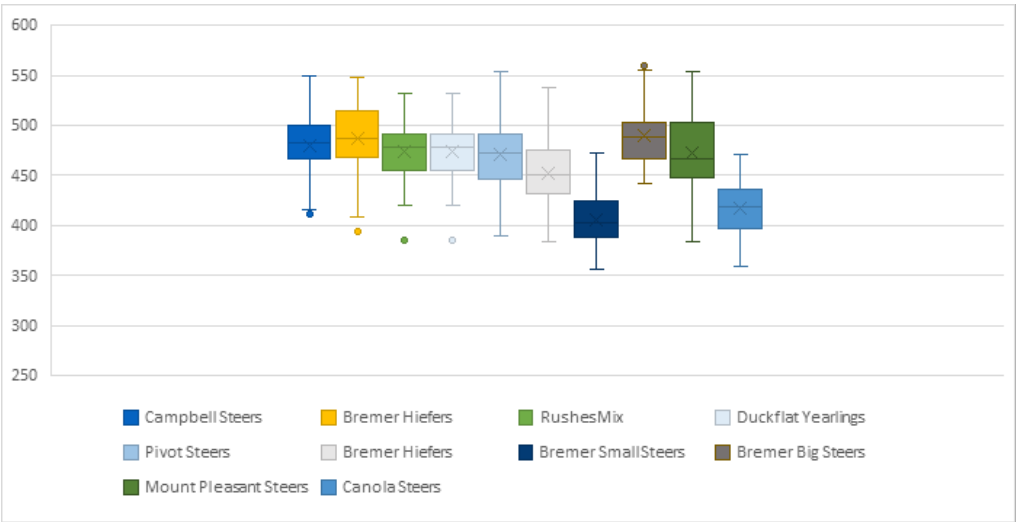

Figure 4: Optiweigh average weights and weight distribution of the 10 herds trialled at the Metcalfe property.

So what does this all mean to the bottom line?

Irongate had a negative net present value (NPV) of -$31,000 that suggests investing in the Optiweigh machine is not financially viable for this enterprise. This is due to Irongate's current satisfactory level of stock weighing practices, indicating limited potential for nutritional management improvement. For Irongate, the primary benefits of the Optiweigh machine come from less time yarding and weighing cattle and subsequent labour reduction. However, the cost-effectiveness is hindered by the necessity of acquiring five Optiweigh machines to cover the large number of animals in the enterprise. To make the investment viable, Irongate would need to achieve the reported benefits with three or fewer Optiweigh machines or find them second hand for $11,000 or less.

The Metcalfe family, on the other hand, had a positive NPV of $45,380, suggesting that investing in the Optiweigh system may be financially viable under the current assumptions.

Table 2. Summary of the key performance indicators.

	Iron gate		Metcalfe	
Benefit/KPI	Value ($/yr)	Value ($/hd)	Value ($/yr)	Value ($/hd)
Reduced labour due to not needing to weigh cattle.	$18,300	$5.2	$19,066	$3.70
Reduced time off feed due to not needing to weigh cattle when yarding for other husbandry activities.	$890	$0.25	$1,650	$0.31
Improved nutrition management.	$0	$0	$7030	$1.35

CONCLUSIONS

The economic analysis showed that in-paddock weighing significantly reduced the time and labour typically spent on cattle weighing activities. The value of the Optiweigh machine varies considerably between producers and depends on the following key drivers:

- Labour cost.
- Capital cost and working life of the Optiweigh machine.
- Time required to yard stock.
- The number of machines required to monitor important stock.
- Ability to utilise the Optiweigh machine to improve nutrition management.

It is vital for the Optiweigh to be on level ground for accurate weights to be recorded. To prevent pugging due to frequent activity to the Optiweigh it is recommended that it be moved regularly to new ground or set up on a pad with secure footing, such as gravel.

ACKNOWLEDGMENTS

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