

MONASH INDUSTRY TEAM INITIATIVE (MITI)

Lactoferrin Yield Optimisation (2022-23)

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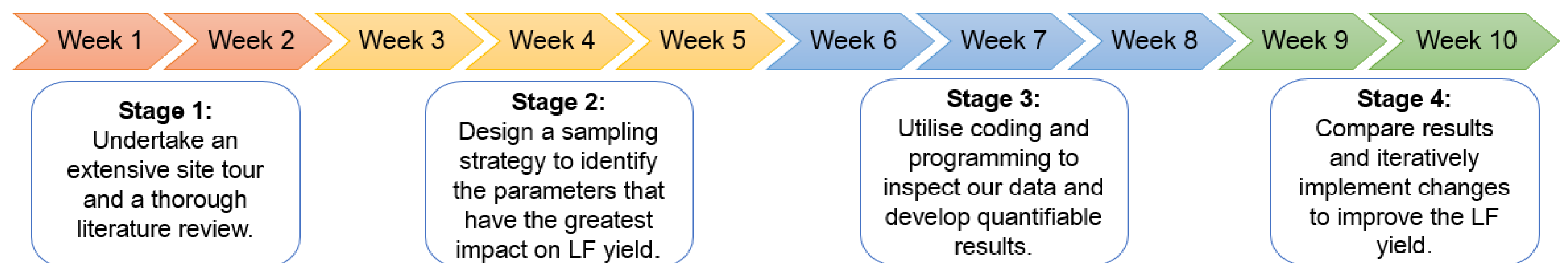
BACKGROUND

Located in South Gippsland, Saputo Leongatha manufactures UHT milk, butter, and powders, such as the nutraceutical supplement lactoferrin (LF), which possesses great immunological benefit with salient use in pharmaceuticals products, particularly baby formula. The intricate process by which LF is extracted from milk relies on two main processes: cation exchange chromatography and ultrafiltration.

PROJECT SCOPE

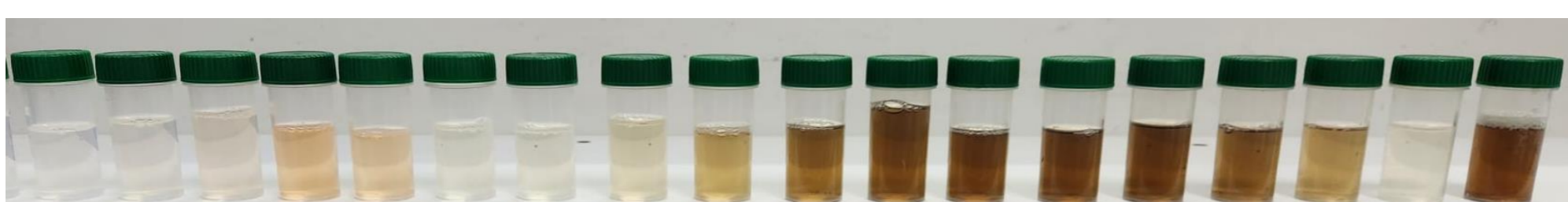
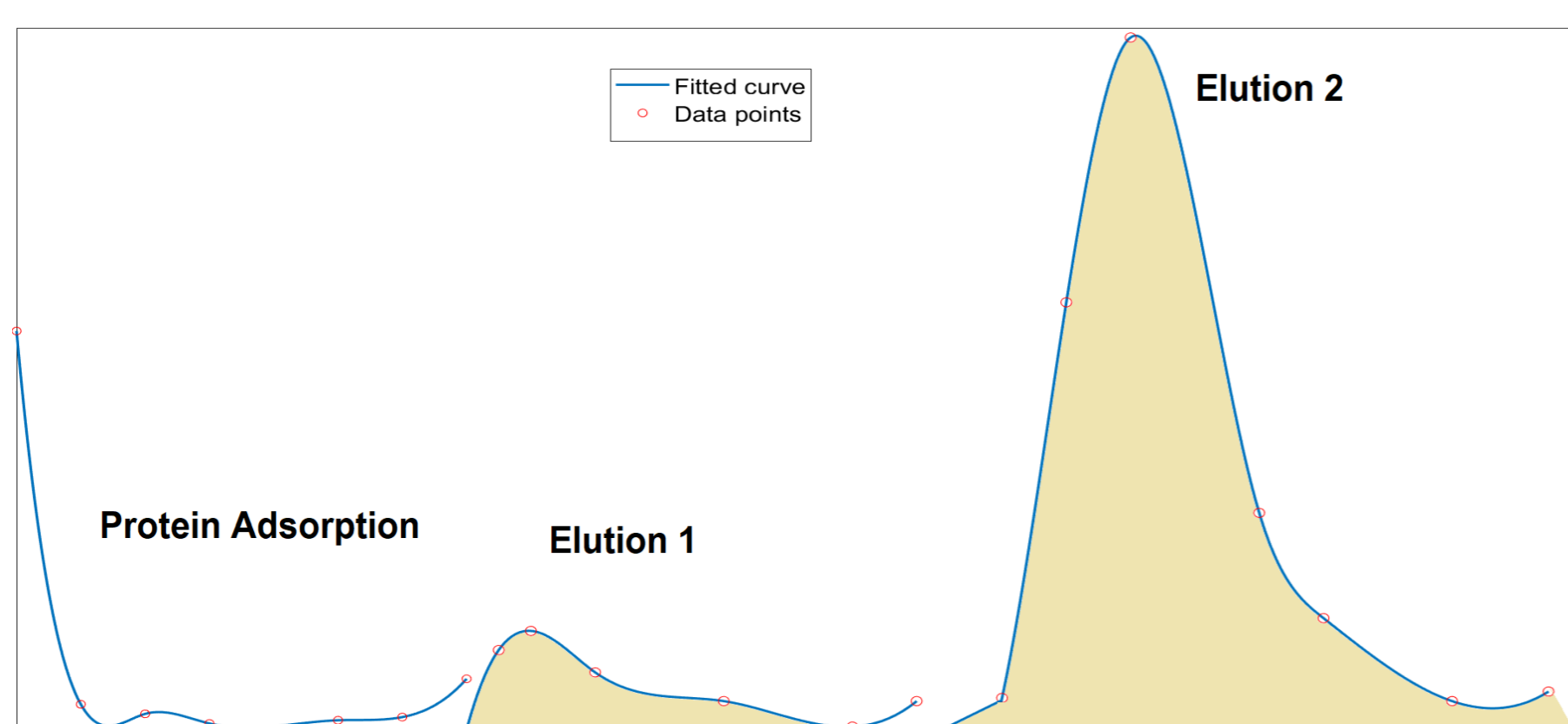
- Understand the LF production process and quantify current performance.
- Identify actions to increase the LF yield in the column chromatography process.
- Implement an ongoing monitoring process that ensures maximum yield of in specification product.

METHODOLOGY



RESULTS + DISCUSSION

The sampling results, both qualitative and quantitative, are shown in the image below. From this data, we were able to quantify not only the amount of protein bound to the chromatography column but also the amount of protein stripped in the two elutions. As a result, multiple improvement actions were suggested, discussed, and implemented.



ACKNOWLEDGEMENTS

We appreciate and thank the Saputo Leongatha team; LF operators Mitch, Brett, Tony and Amrit, as well site manager Jason and factory manager Ian Hone, and especially our supervisor Chris. We also thank the Gardiner Foundation and the MITI team for their support.

CONCLUSIONS

- The LF production process was comprehensively understood, and through sampling and analysis the current performance was quantified.
- The implemented actions led to a significant increase in LF yield, resulting in higher protein recovery per liter of milk. This improvement can mainly be attributed to the strategies that were put in place.
- The implementation of an ongoing monitoring process was not viable due to limitations in the available technology. Nevertheless, alternative means by which this can be achieved were investigated and provided.
- The success of our project was only possible due to the combination of effective communication, teamwork, and mutual trust among team members.

