

Effect of milk and elution on isolating bovine milk lactoferrin

Jaishree Ravindran¹, Nidhish Francis², Bing Wang¹

¹School of Agriculture, Environmental and Veterinary Sciences, Charles Sturt University, Wagga Wagga, Australia

²School of Dentistry and Medical Sciences, Charles Sturt University, Wagga Wagga, Australia

Introduction

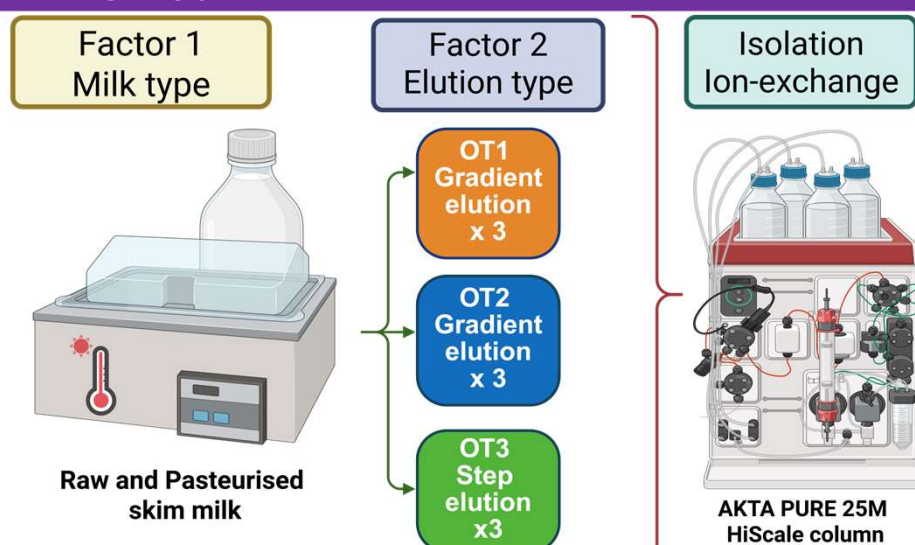
- Lactoferrin (LF) is an iron-bound sialylated glycoprotein discovered in mammalian milk with numerous biological functions and nutritional applications.^{1,2,3}
- A fundamental challenge is to increase **yield** and maintain **purity**. One million liters of milk produces ~100kg of lactoferrin¹

Research Aims

- To determine the impact of elution type and the type of milk on lactoferrin absorbance.
- To determine which method yielded the maximum lactoferrin isolation.
- Develop and optimise innovative method for industry application

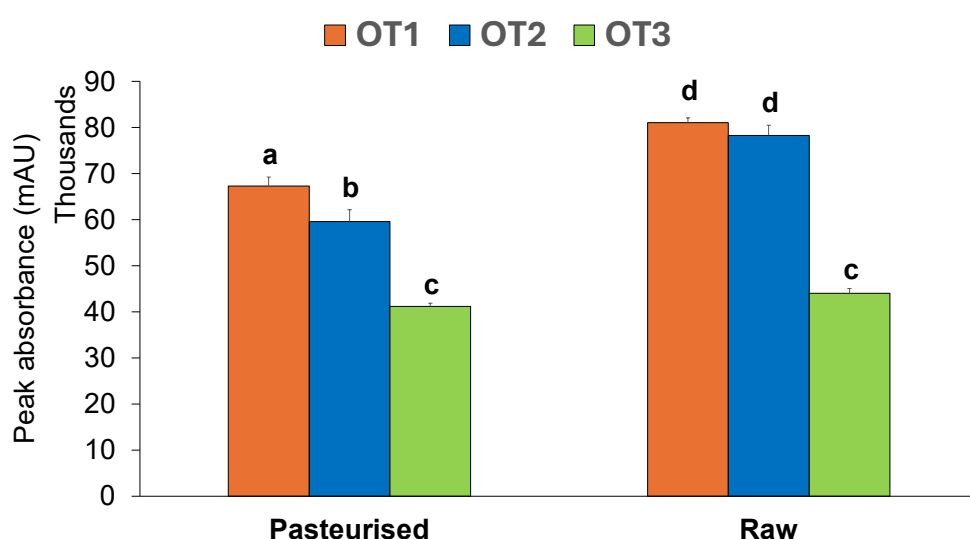
Method

- AKTA Pure 25M Fast Protein Liquid Chromatography (FPLC)
- HiScale column with Sunresin BB
- Factor 1** – Milk type
Pasteurised milk and unpasteurised milk
- Factor 2** – Elution type
Gradient elution 1(OT1), gradient elution 2 (OT2), and Step elution 3 (OT3)
- Full factorial design in triplicate



Results

- Absorbance OT1 > OT2 > OT3
- Pasteurised milk:
OT1 > OT2 by 13%
OT1 > OT3 by 64%
OT2 > OT3 by 45%
- Raw milk:
OT1 > OT3 by 84%
OT2 > OT3 by 78%
- OT1 Raw > Pasteurised by 20%
- OT2 Raw > Pasteurised by 31%
- No difference between raw and pasteurised milk for OT3 ($p > 0.05$)



Conclusions

- Highest absorbance in OT1 raw milk
- No impact of milk type on step elution
- Industry application is feasible for gradient elution
- Research required on alternative resins and byproduct recovery

References

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Acknowledgements