

# Viability of microencapsulated probiotic bacteria in a cream/ gel-like solution for topical application

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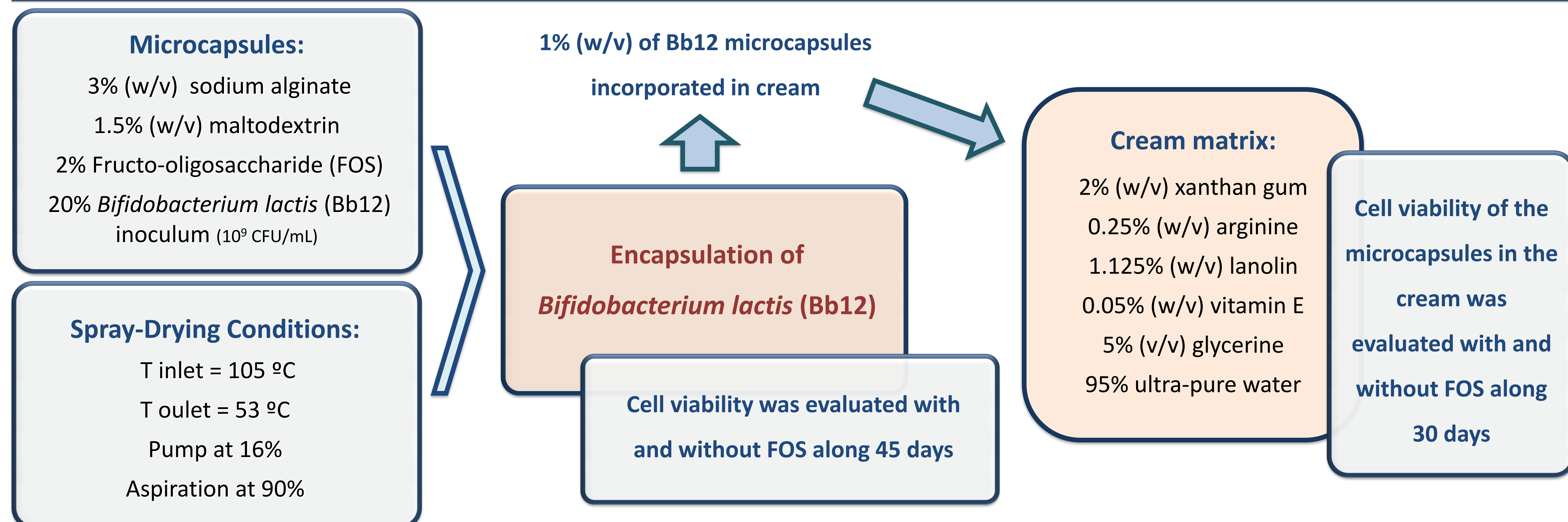
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## Introduction

Encapsulation technology has been used as a means to improve the viability of bacteria for long periods of time in hostile environments. For that, it is necessary to immobilize the bacterial cells in a matrix that can protect them from the abiotic factors surrounding them [1]. Several methods are available for that purpose, such as spray-drying, extrusion, emulsion and phase separation [2]. In this work, the spray-dryer technique was used to encapsulate probiotic bacteria in an alginate matrix. This protects and confers an extended shelf-life to the bacteria to be used in a specific application (probiotic-containing solution to be topically applied to skin). Moreover, maltodextrin was added to the alginate solution, with the purpose of creating space within the capsules, protecting the bacteria from the high temperatures attained in the spray-dryer during the process [3]. The cell viability of the microcapsules containing the probiotic was assessed throughout time and also after incorporating in the cream/gel matrix.

## Methods



## Results

Figure 1 – Effect of the addition of FOS to alginate matrix on *Bifidobacterium lactis* (Bb12) viability after spray-drying.

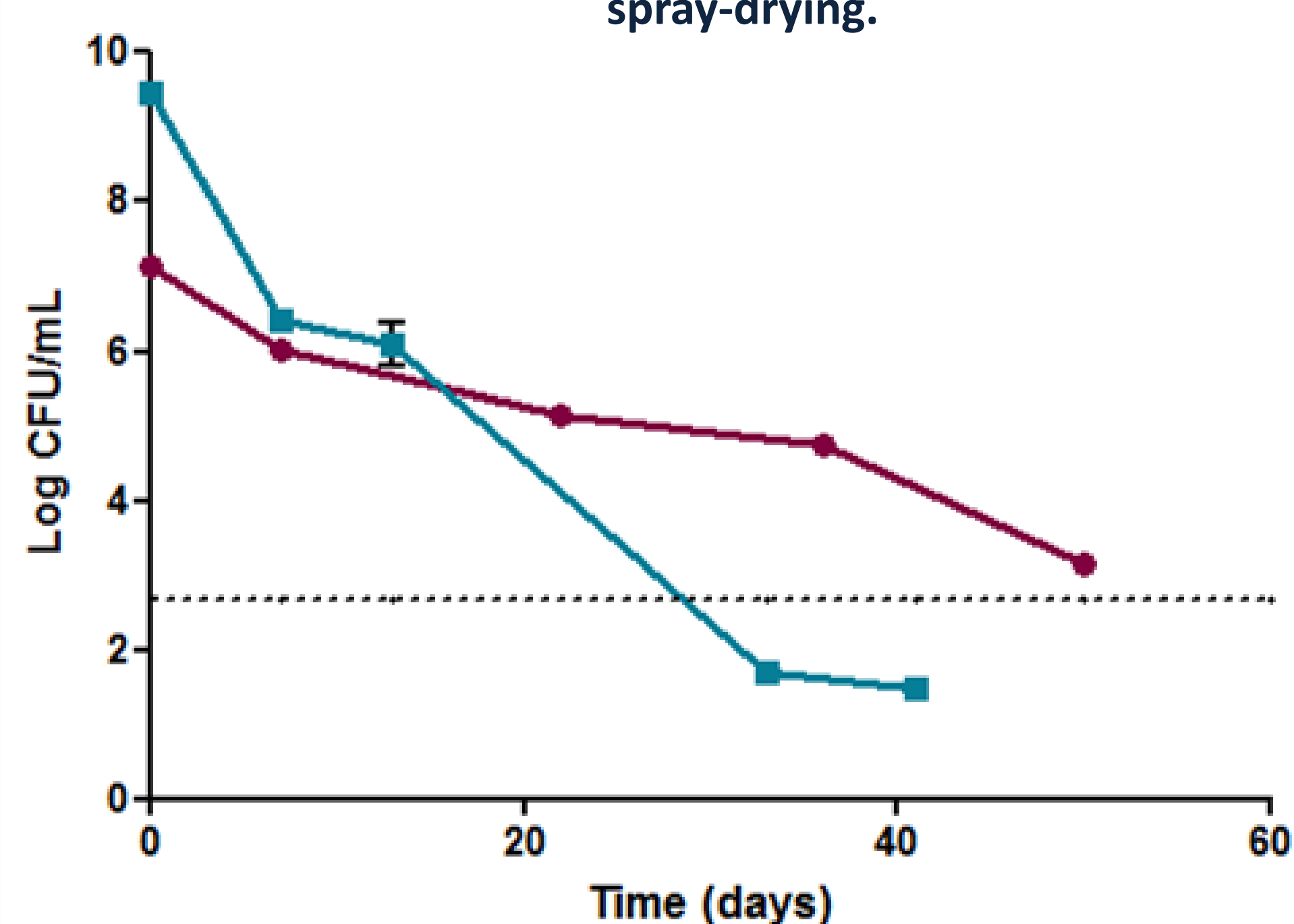
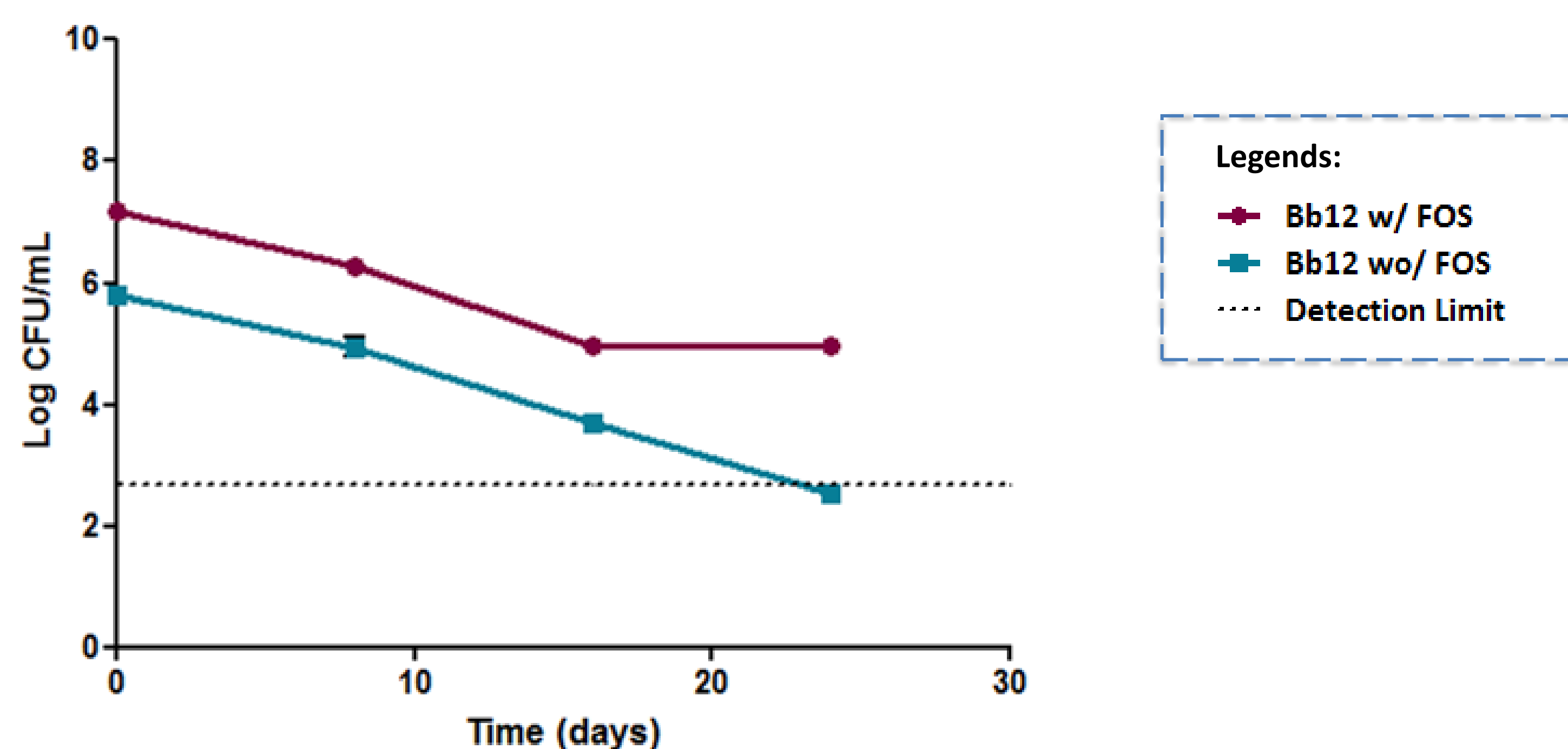


Figure 2 – Cell viability of *Bifidobacterium lactis* (Bb12) microcapsules in the cream matrix.



## Conclusions

- ✓ *Bifidobacterium lactis* (Bb12) microcapsules with FOS showed more resistance to the storage.
- ✓ After around 45 days, the cell viability dropped ca. 4 logs for the microcapsules with FOS added.
- ✓ When added to the cream matrix, *Bifidobacterium lactis* (Bb12) microcapsules with FOS were also more resistant to the storage.
- ✓ After 25 days the cell viability has dropped ca. 1 log and 3.5 logs for the microcapsules with and without FOS, respectively.
- ✓ Encapsulation with prebiotics (FOS) seems to aid in the maintenance and stability of cell viability and the ingredients in the final formulation may confer added protection to the bacteria.

## References

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- [2] Riaz, Q.U. and Masud, T. (2013) Recent trends and applications of encapsulating materials for probiotic stability. *Critical Reviews in Food Science and Nutrition* 53(3): 231-244.
- [3] Sohali, A., Turner, M.S., Coombes, A., Bhandari, B. (2013) The viability of *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* NCFM Following Double Encapsulation in Alginate and Maltodextrin. *Food and Bioprocess Technology* 6(10): 2763-2769.

## Acknowledgements

The authors hereby acknowledge the National Funds from FCT (Fundação para a Ciência e a Tecnologia) through project EXPL/BBB-BIO/1113/2013 provided funding for the realization of this work and to the National Funds from FCT through project PEst-OE/EQB/LA0016/2013.