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Influence of A1 and A2 β-casein on early gut microbiota in a bovine animal model

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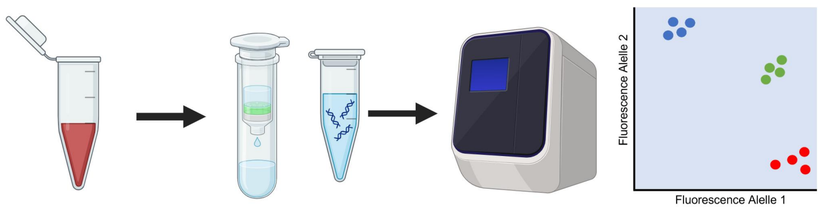
INTRODUCTION & AIM

In recent years, beta-casein in bovine milk has attracted the attention of the research community. Bovine β-casein has two main variants associated with an amino acid change at residue 67, i.e. variants A1 and A2. The first has being associated with gastrointestinal discomfort and allergic problems due to the release of β-casomorphin-7 during protein digestion. The A2 variant may facilitate the digestion and help prevent the gastric discomfort that some people experience when consuming milk (Fernández-Rico et al., 2022). However, the data obtained so far is still limited. This work aims to determine if A2 milk consumption has a positive effect on the growth and intestinal microbiota of Holstein newborn calves, used as an animal model.

METHOD

Genotyping

Blood collection from cows of a local dairy farm

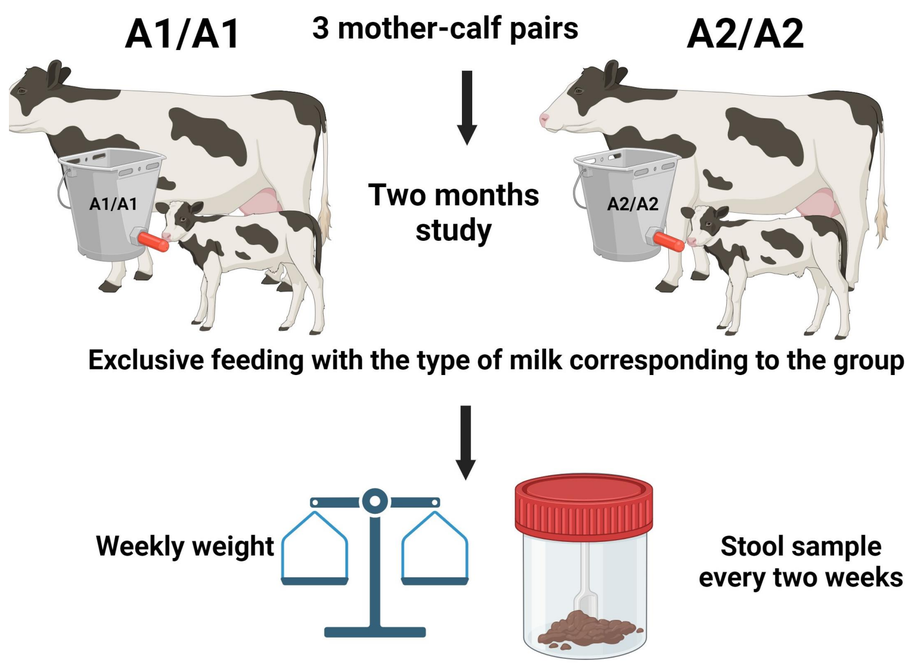


200uL blood

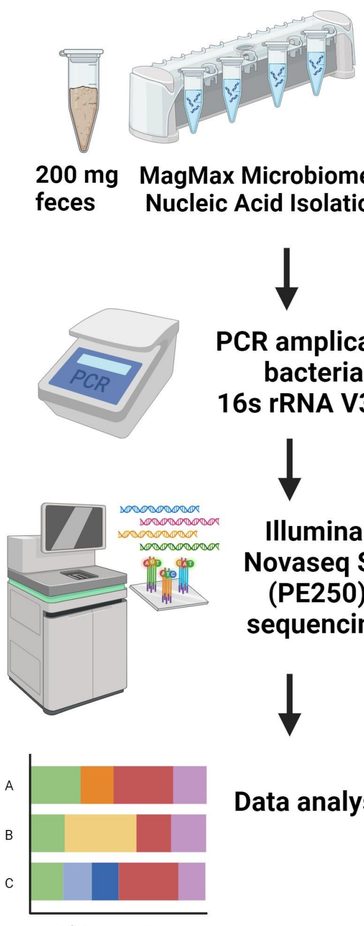
DNA isolation Purelink Genomic DNA mini kit

qPCR genotyping of *CSN2* gene for A1/A1 and A2/A2 animal selection

Study design



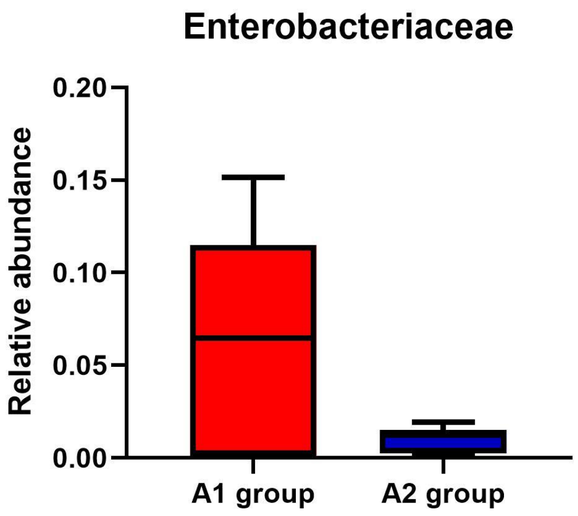
16s rRNA sequencing

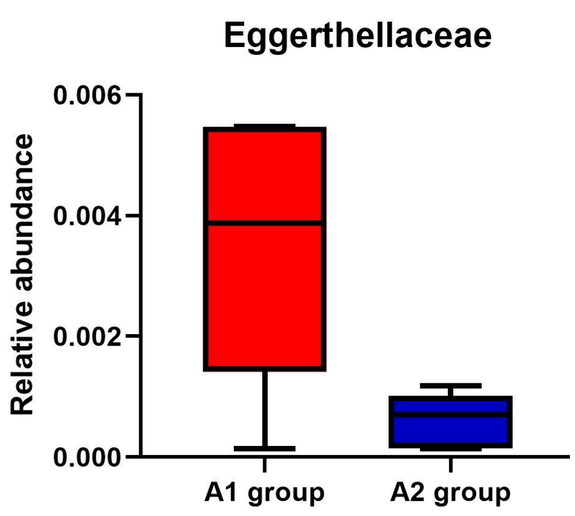


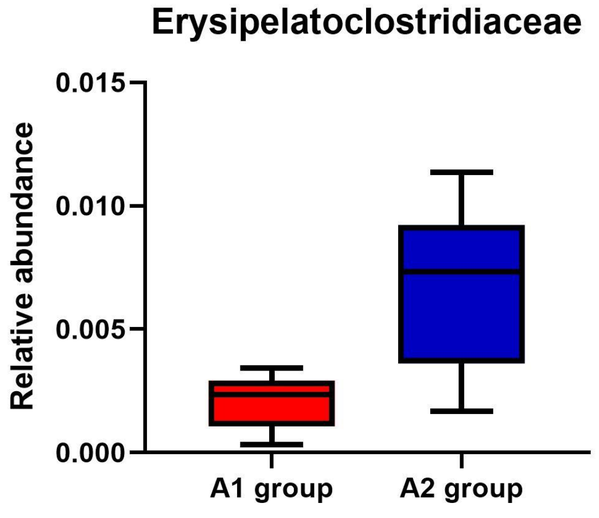
RESULTS & DISCUSSION

Percentage of body weight gain two months after birth was higher in A2/A2-fed calves (52.2 ± 10.1 %) than in A1/A1-fed calves (47.6 ± 6.0 %), although this difference was not statistically significant.

The relative abundance of Enterobacteriaceae and Eggerthellaceae was higher in calves fed with A1/A1 milk compared to those fed A2/A2 milk. On the other hand, the relative abundance of Erysipelatoclostridiaceae and Clostridia UCG-014 was higher in calves fed with A2/A2 milk.







CONCLUSION

The type of beta-casein ingested shows an influence on growth and significant changes of intestinal microbiota in calves, which may result on changes upon intestinal health. More studies are necessary to confirm these changes and translate their possible effects to human health.

REFERENCES

Fernández-Rico, S., Mondragón, A. D. C., López-Santamarina, A., Cardelle-Cobas, A., Regal, P., Lamas, A., .Ibarra, I.S, Cepeda, A. & Miranda, J. M. (2022). A2 milk: New perspectives for food technology and human health. *Foods*, *11*(16), 2387.