

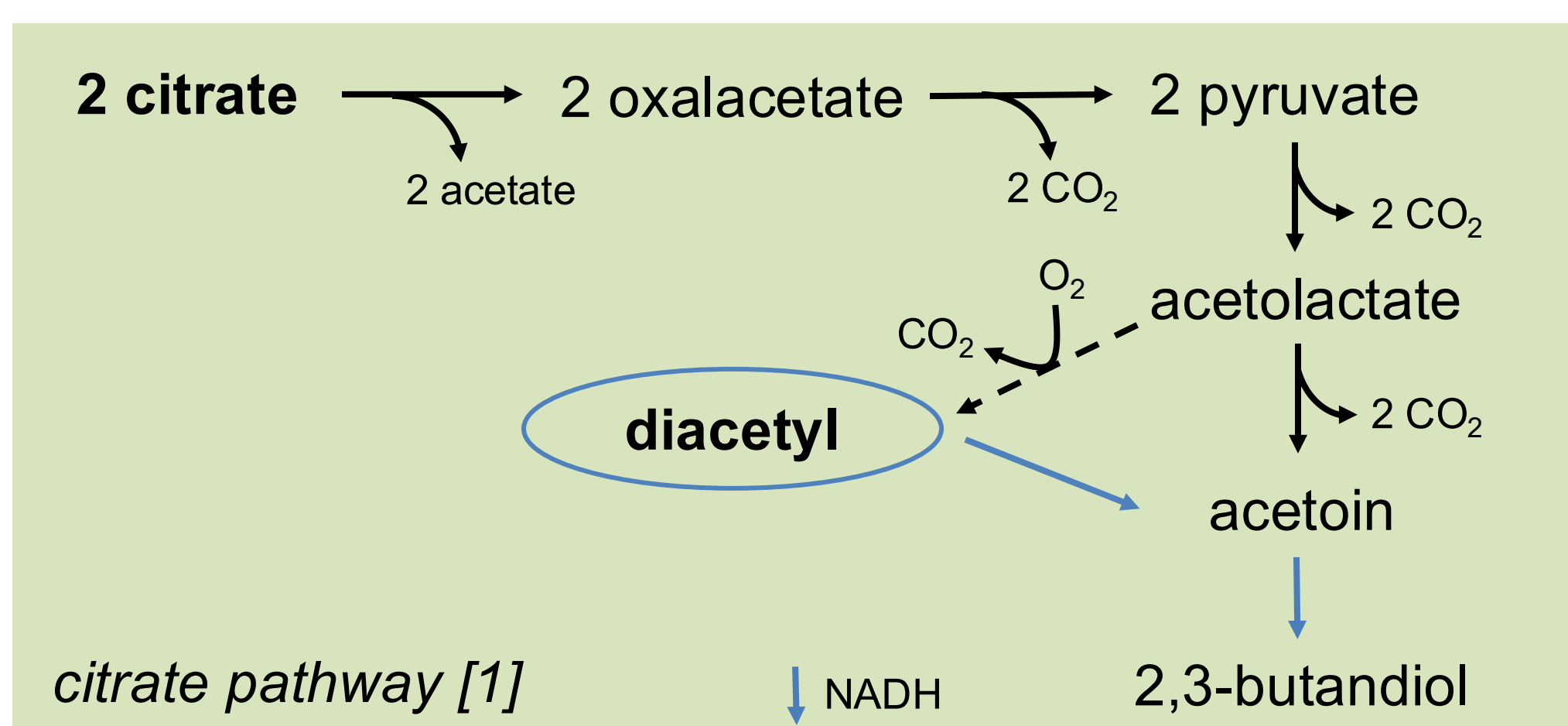
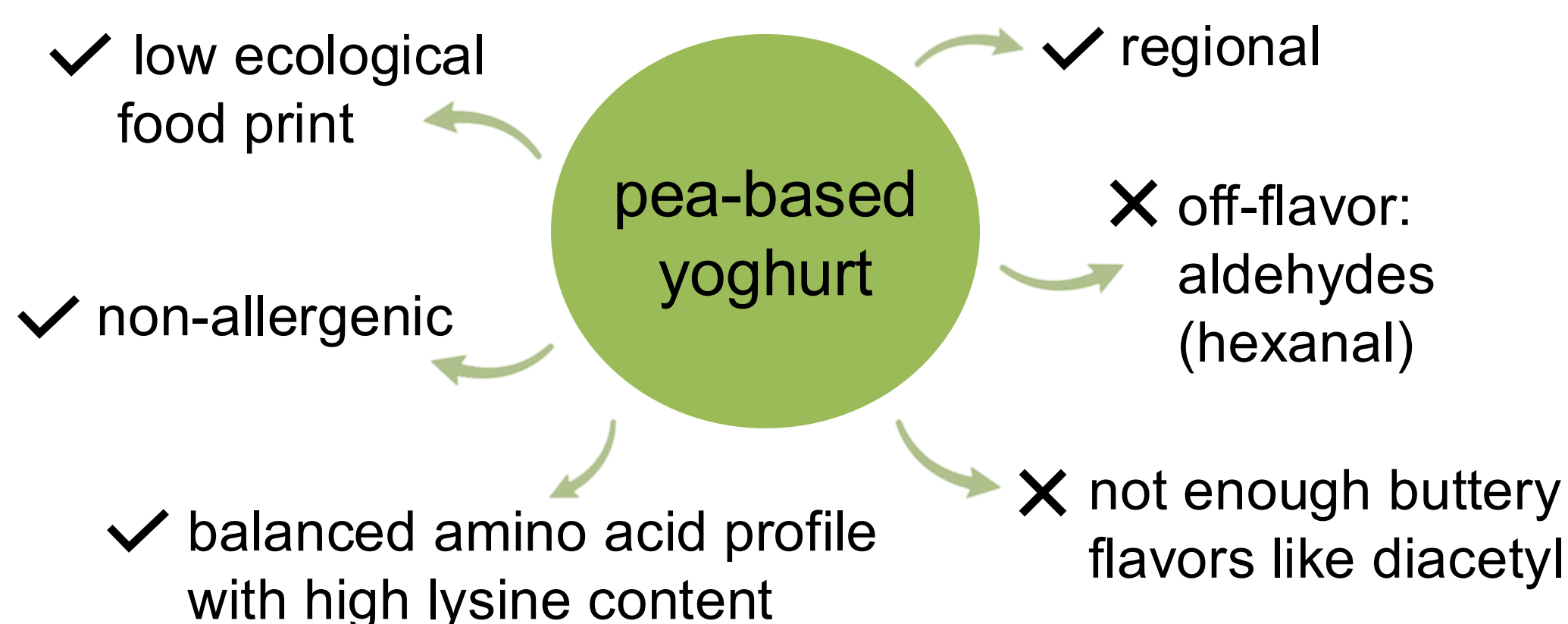
The influence of citrate on aroma development during pea protein fermentation

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INTRODUCTION & AIM



➤ **Aim: improving the aroma of a pea-based yoghurt through fermentation with citrate or ferrous supplement**

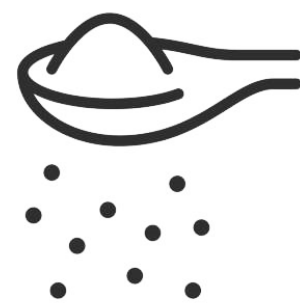
METHOD



pea substrate

5,0 % pea protein
0,3 % glucose
0,5 % sucrose
1,0 % rapeseed oil

+



additives

sodium citrate
iron (II) gluconate/iron bisglycinate

+



fermentation

mix: *S. thermophilus* + *L. rhamnosus*
cs: commercial starter culture

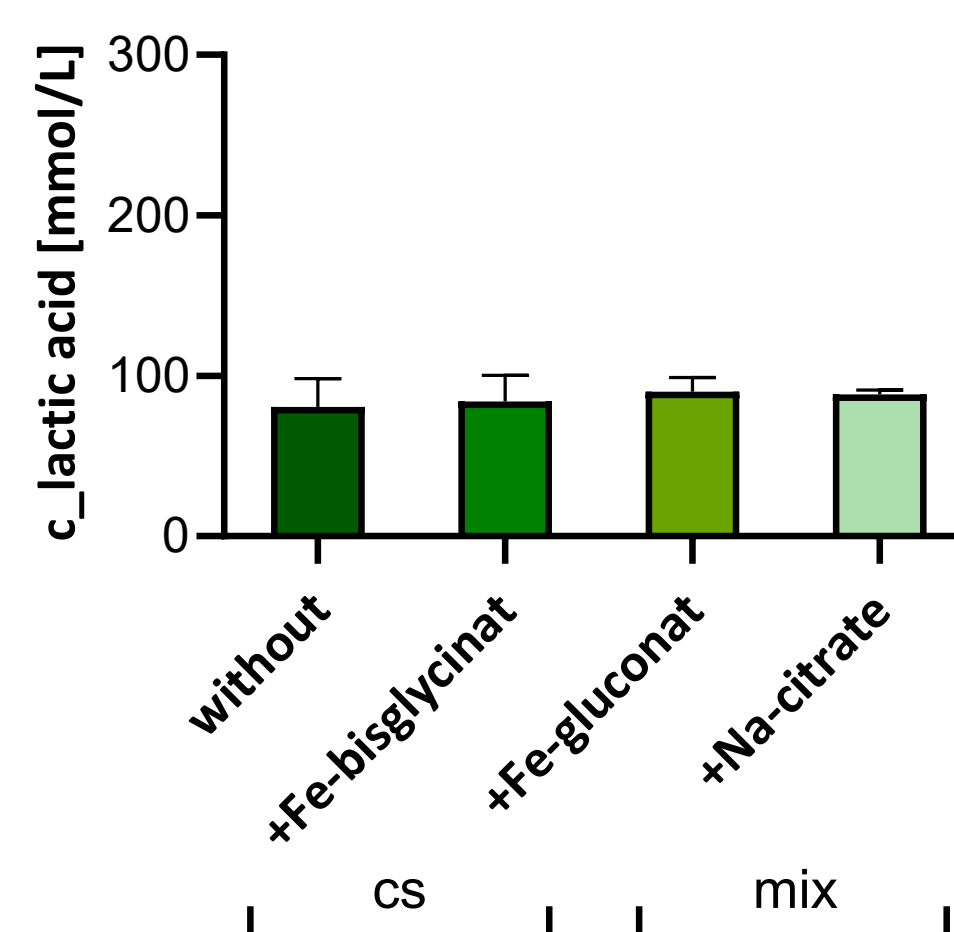


chemical analyses

HS-GC-MS: amount of volatile compounds
GC-FID: quantification of lactic acid

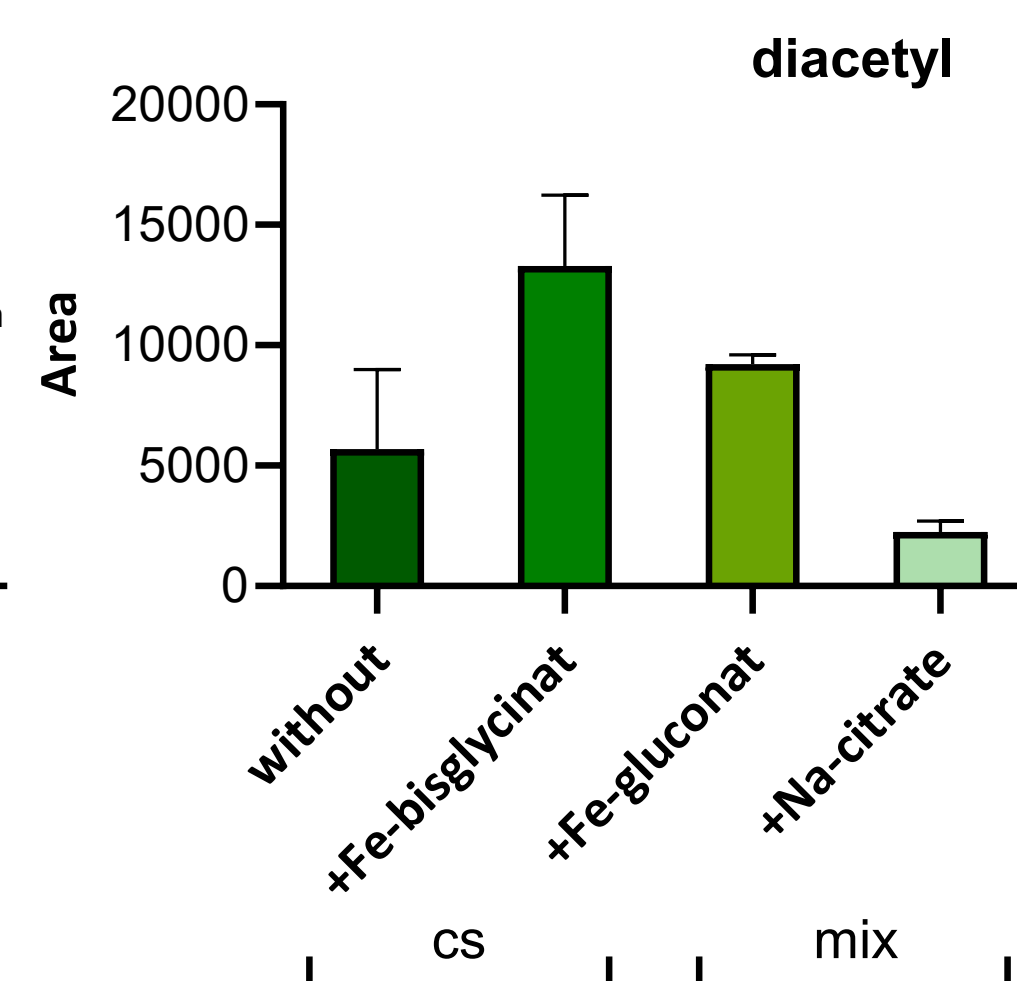
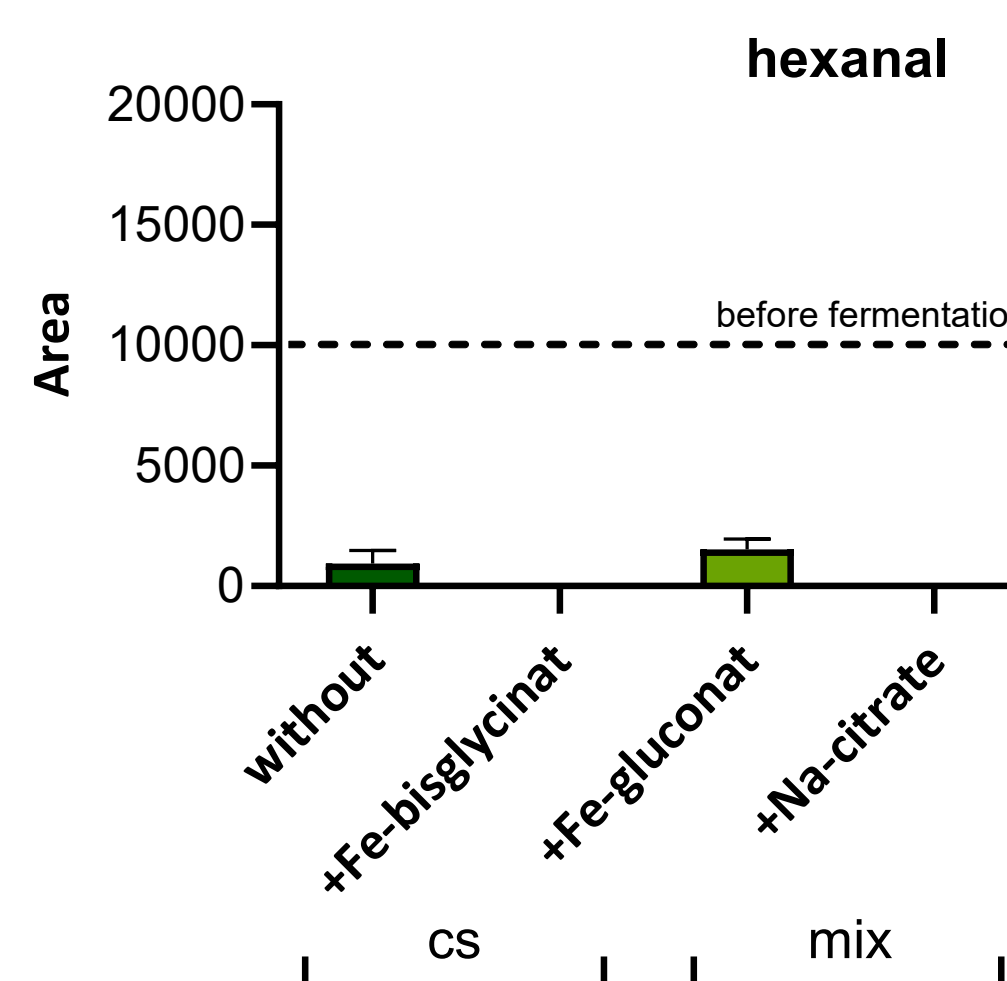
RESULTS & DISCUSSION

acidification



- after fermentation the concentration of lactic acid reached roughly 100 mmol/l
- the different additives show no influence on the acidification of the pea-based substrate

aroma profile



- the amount of hexanal is significantly reduced after fermentation, especially when Fe-bisglycinat or Na-citrate is added
- the production of diacetyl is not increased with citrate
- the highest amount of diacetyl is reached with the addition of Fe-bisglycinat in the commercial starter culture
- because metal ions can catalyze the conversion of acetolactate into diacetyl [2]

CONCLUSION

- the fermentation with lactic acid bacteria improved the sensory profile of a pea based yoghurt alternative
- the addition of Fe-bisglycinate (and Fe-gluconate) seems to be more efficient in increasing the production of the buttery aroma compound diacetyl as the addition of citrate

REFERENCES

- [1] Chen, C.; Zhao, S.; Hao, G.; Yu, H.; Tian, H.; Zhao, G. Role of Lactic Acid Bacteria on the Yogurt Flavour: A Review. *International Journal of Food Properties* 2017, 20 (sup1), S316–S330.
- [2] Dorau, R.; Chen, L.; Liu, J.; Jensen, P. R.; Solem, C. Efficient Production of α-Acetolactate by Whole Cell Catalytic Transformation of Fermentation-Derived Pyruvate. *Microbial Cell Factories* 2019, 18 (1), 217.