

Linking amino acids to milk fat synthesis

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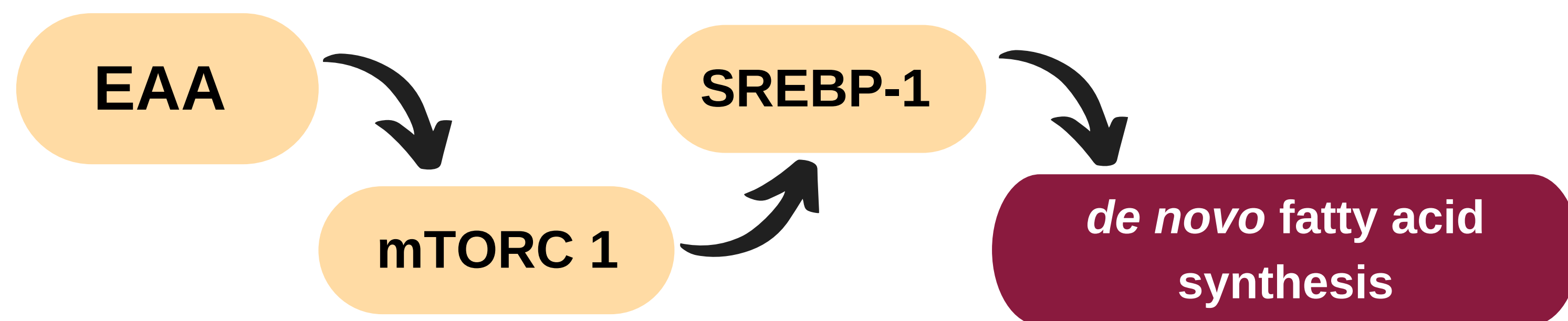


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Abstract: 2376W

Introduction

It's been observed that milk fat yield changes when bovine mammary epithelial cells are supplemented with essential amino acids (EAA) at supraphysiological levels. This effect has been related to the role that EAA play in regulating mTORC1, which is associated to SREBP-1, an essential factor involved in the regulation of the *de novo* fatty acid synthesis.

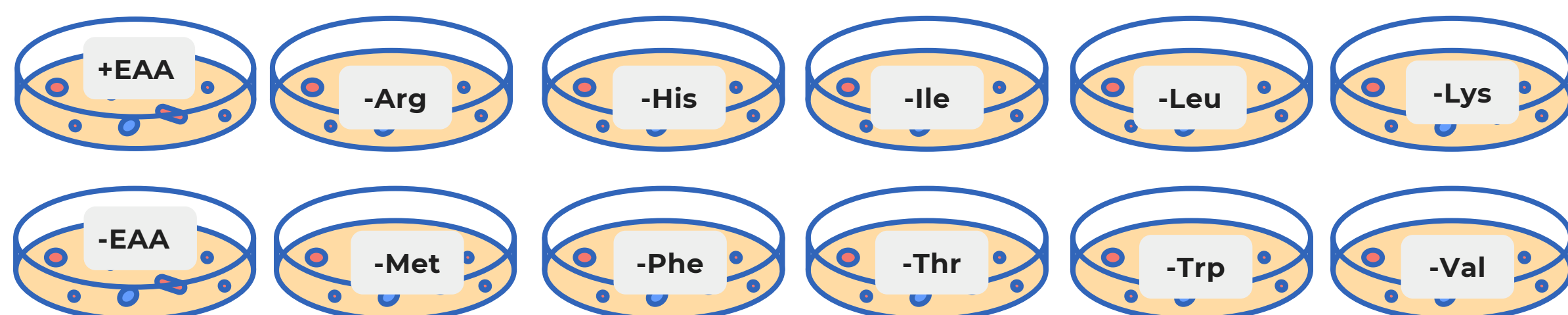


Objective

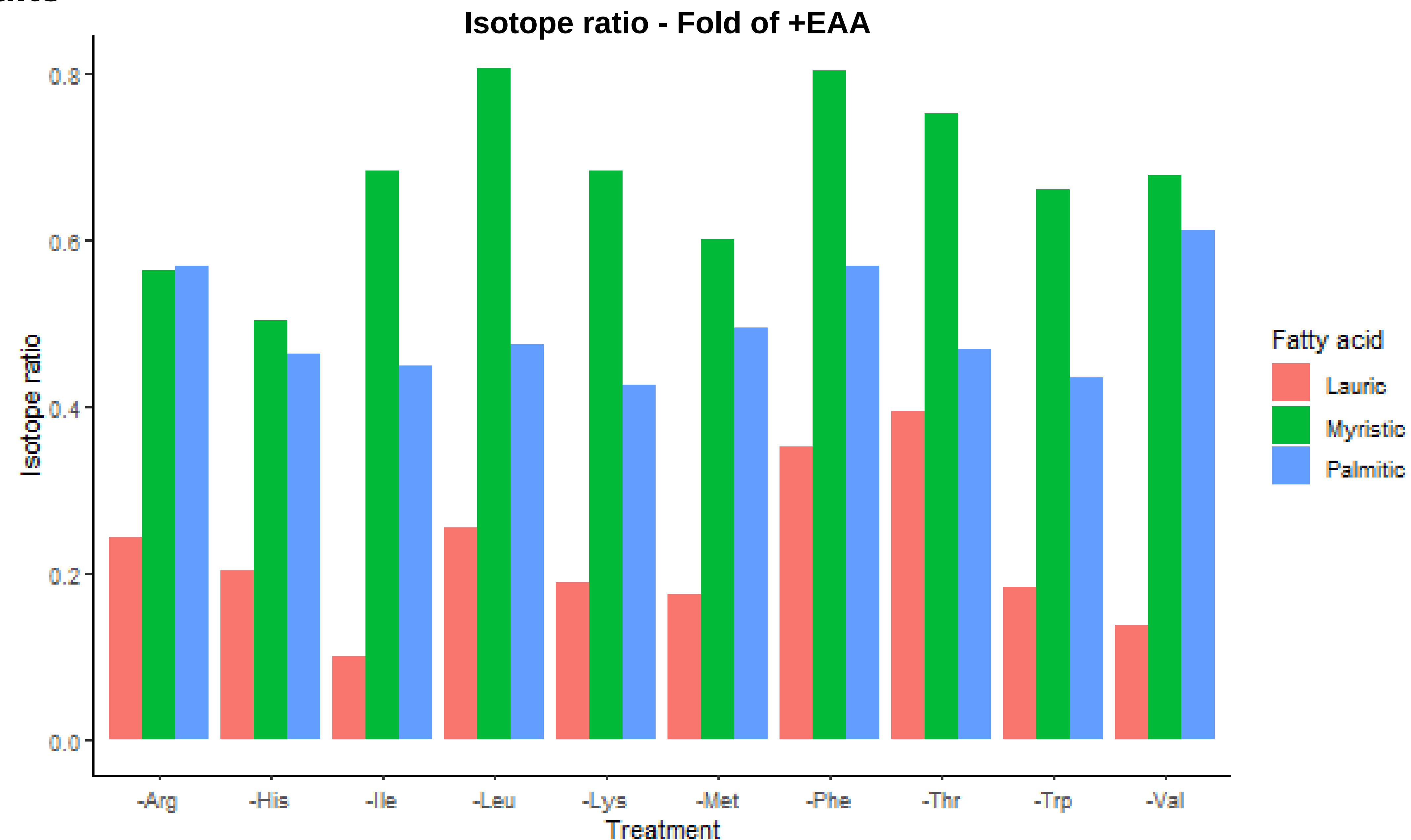
This study aims to evaluate the effects of each EAA at physiological levels, in *de novo* milk fat synthesis in bovine mammary epithelial cells.

Methodology

- Bovine mammary cells from 3 animals were submitted to 12 treatments, varying EAA profile in five different blocks. The media for all treatments was mimicking physiological levels of amino acids in dairy cows and one EAA was omitted at a time.
- Isotopically labelled acetate (C¹³) was used as a tracer for measuring the *de novo* milk fat synthesis.
- Least Squares Means (LS Means) was used for the analysis of the linear model-based data using the package 'lsmeans' version 2.30-0 in R software.



Results



Conclusions

Considering *de novo* fatty acids (Lauric and Myristic) and mixed (Palmitic) it's possible to observe that some EAA indeed affect the milk fat yield in bovine mammary cells. In general Isoleucine, Leucine, Methionine and Lysine are the ones that affect the *de novo* fatty acid synthesis the most. Even though there's no significant difference between those treatments it's expected that in a *in vivo* trial the milk fat yield would be affected by supplementation of those amino acids and a statistical difference would be established.