

IMPACT OF LYSOLECITHIN, MONO-GLYCERIDE AND EMULSIFIER COMBINATIONS ON EMULSION STABILITY AND LIPID HYDROLYSIS

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Introduction

Use of lysolecithin has been shown to improve the ability of birds to absorb lipids. The combination with monoglycerides and a synthetic emulsifier (ME) can further enhance this, but little research is available on the effect of the lysolecithin dose as such. Therefore, 3 in vitro experiments were conducted, to assess the impact of increasing lysolecithin concentration (LPL, lysophospholipids) in combination with 8,85% ME inclusion, on emulsion stability, lipid hydrolysis and relative quantification of free fatty acids and mono-, di- and triglycerides.

Mixtures



LPL 25%: Rapeseed oil + lysolecithin 25% mixture with or without ME (LPL25 + or -)

LPL 35%: Rapeseed oil + lysolecithin 35% mixture with or without ME (LPL35 + or -)

LPL 45%: Rapeseed oil + lysolecithin 45% mixture with or without ME (LPL45 + or -)

LPL 55%: Rapeseed oil + lysolecithin 55% mixture with or without ME (LPL55 + or -)

LPL 65%: Rapeseed oil + lysolecithin 65% mixture with or without ME (LPL65 + or -)

Analyses

Emulsion stability

Lipid hydrolysis

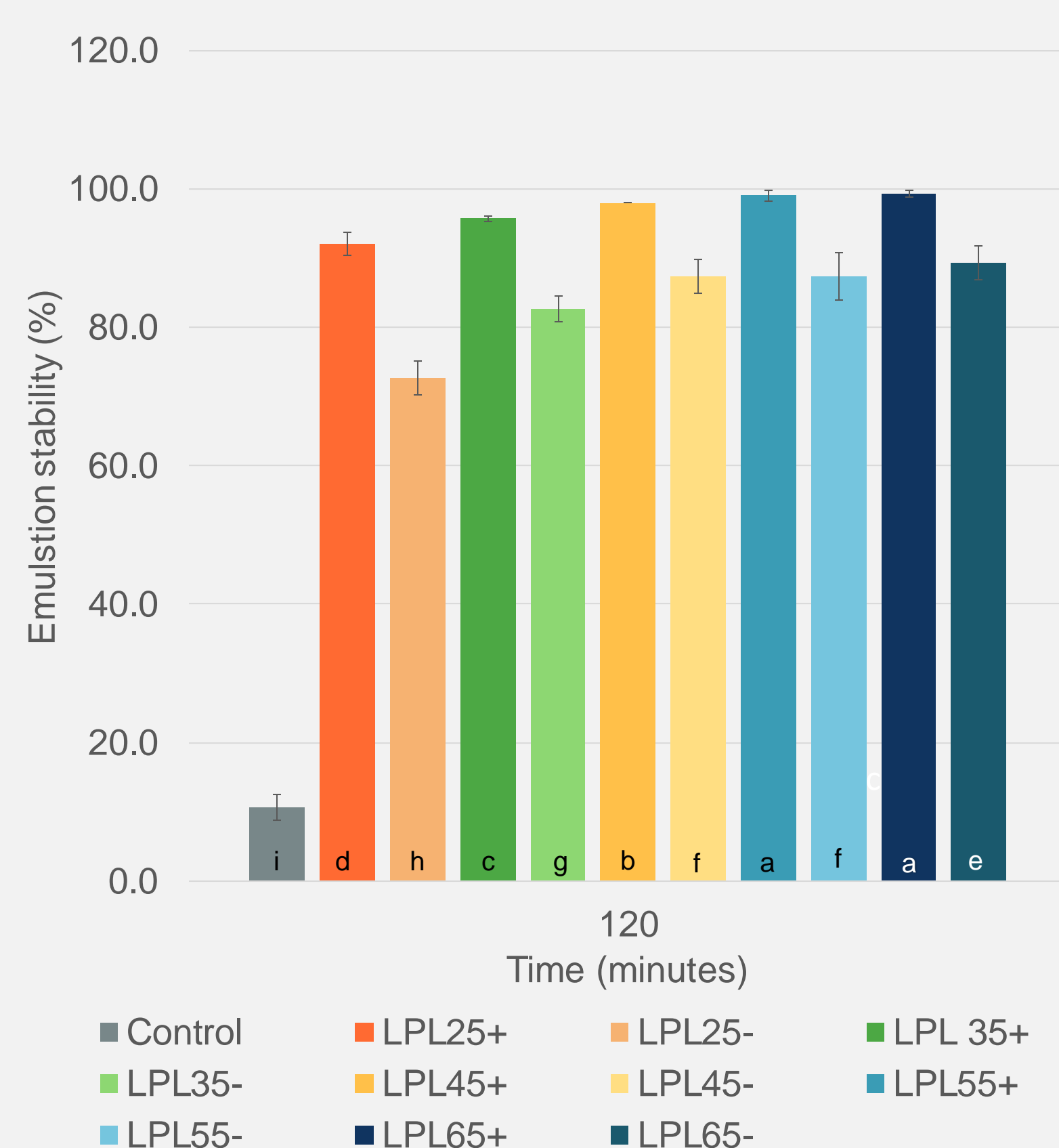
MAG, DAG, TAG and FFA measurement

Statistical analyses were carried out using the Fit Model platform of JMP 15

Results

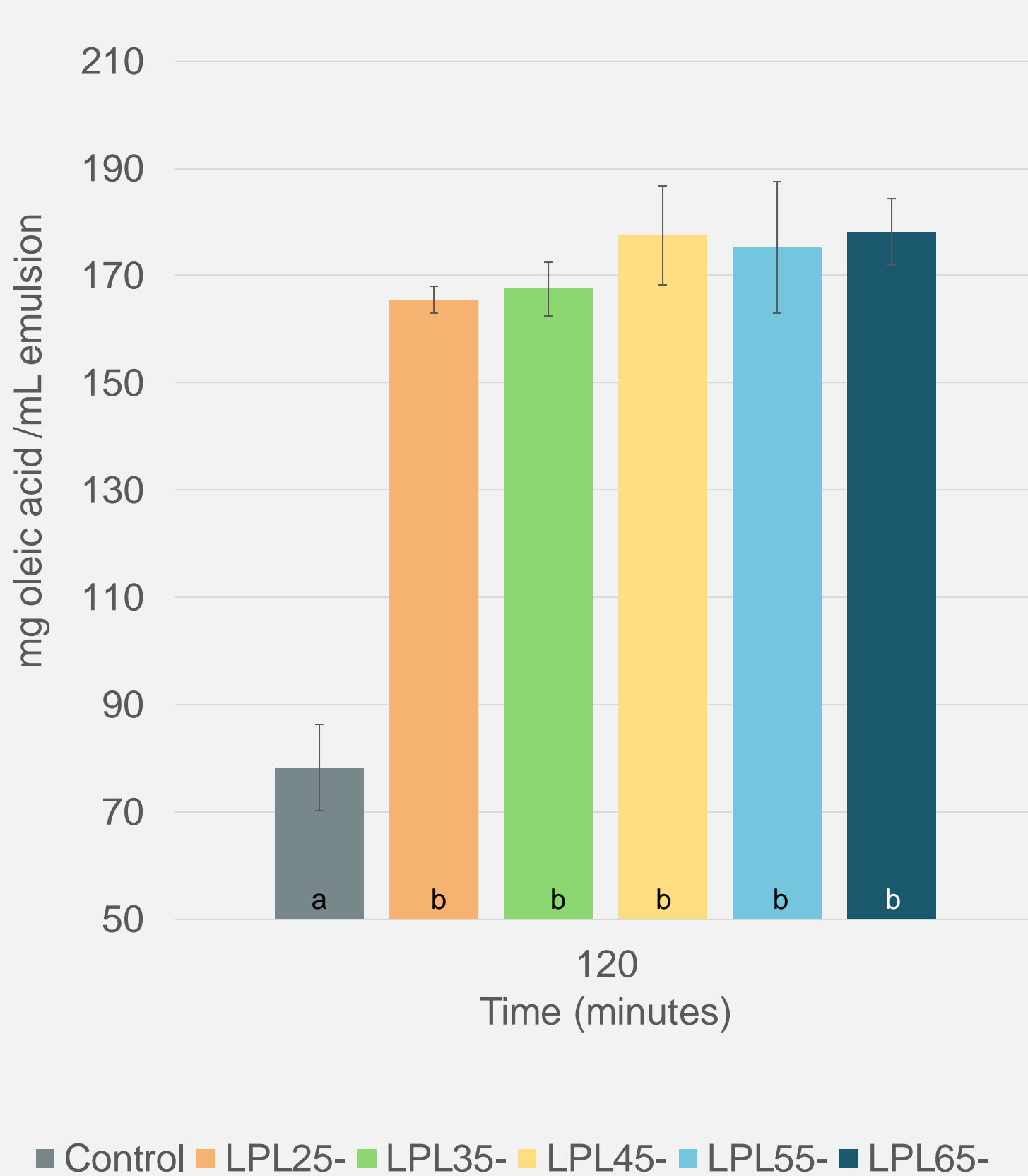
Emulsion stability

Fig. 1 | Emulsion stability of various LPL mixtures with and without ME (mean ± stdev) (p<0,05) control samples did not contain any product



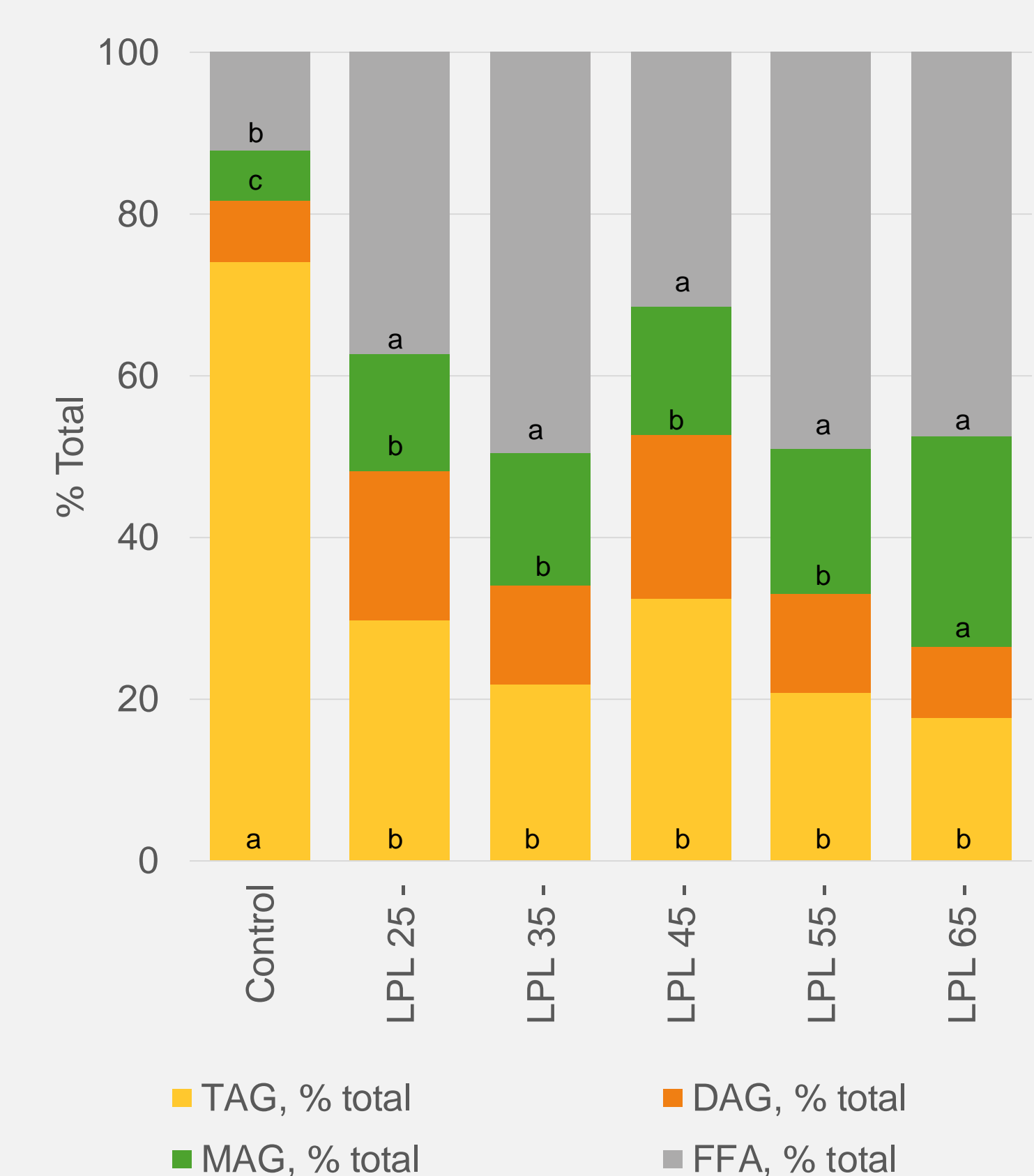
Lipid hydrolysis

Fig. 2 | Extent of lipid hydrolysis with LPL mixtures (mean ± stdev) (p<0,05) control samples did not contain any product



MAG, DAG, TAG and FFA

Fig. 3 | MAG, DAG, TAG and FFA proportions after 120 minutes (mean). DAG P>0,05. control samples did not contain any product



Values that differ significantly (P≤0.05) are indicated by different letters or by stars.

Conclusions

- Addition of monoglycerides and a synthetic emulsifier to lysolecithins, created more stable emulsions compared to only applying lysolecithins at a similar concentration.
- Addition of LPL significantly improves lipid hydrolysis compared to the control. However, there is no significant effect of increased LPL concentration
- There were linear and quadratic effects of LPL level of TAG, MAG and FFA levels (p<0,05)
- Degradation of triglycerides (TAG) and production of FFA plateaued between 25 and 55% LPL addition