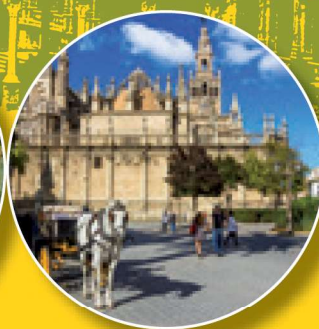


17th Euro Fed Lipid Congress and Expo

20 – 23 October 2019
Seville · Spain

OILS, FATS AND LIPIDS

Driving Science and Technology
to new Horizons



BOOK OF ABSTRACTS

www.eurofedlipid.org/pages/sevilla

Novel Rumen-protected Omega-3 Supplements Escaping to Ruminal Lipid Metabolism *in vitro*

S.P. Alves¹, A.C.M.M. Vítor¹, J. Pinto², R. Bexiga¹, R.J.B. Bessa¹, L. Lopes-da-Costa¹

¹Faculdade de Medicina Veterinária, Universidade de Lisboa, LISBOA, Portugal

²Eurocereal-Comercialização de Produtos Agro-Pecuários S.A., MALVEIRA, Portugal

The goal of increasing the content of polyunsaturated omega-3 fatty acids (FA) in ruminants' milk and meat is hampered by the lipid metabolism in the rumen. Indeed, the microbial population in the rumen metabolize the dietary polyunsaturated FA, through isomerization and hydrogenation of FA double bonds, forming a wide range of FA intermediates and saturated FA. To avoid this metabolization, several rumen-protected fat products have been developed and tested without great success so far. In this work, 6 novel rumen-protected products, based on encapsulation of a linolenic acid (LNA) source within a high-melting point lipid matrix, were tested *in vitro*. Each product, as well as an unprotected linseed as control, were incubated in Hungate tubes containing a complete feed ration and 6 mL of buffered ruminal fluid. *In vitro* batch incubations were performed for 0, 4, 10, and 24 h and replicated in three consecutive weeks. Fatty acid methyl esters were prepared and analyzed by gas chromatography. Additionally, ruminal in sacco dry matter disappearance of the most promising products were also evaluated using a fistulated sheep. Results showed that at 4 hours of incubation all products had lower ($P < 0.05$) LNA disappearance compared to control. At 10 hours of incubation 4 products showed less than 20% of LNA disappearance, whereas unprotected linseed showed 62% ($P < 0.05$). At 24 hours of incubation Products 3 and 4 showed less than 40% of LNA disappearance, whereas Control and Products 1 and 5 showed about 80% ($P < 0.05$). The ruminal dry matter disappearance of both Products 3 and 4 using the in sacco technique was about 6% and 2%, respectively. Thus, two of the products tested (3 and 4) showed great potential to be used as a source of dietary rumen-protected omega-3 for ruminants.

The authors acknowledge financial support provided by FEDER program (Project NAT-OMEGA3, PDR2020 -1.0.1- FEADER-031461) and by Fundação para a Ciência e a Tecnologia (FCT) through UID/CVT/276/2019.