

THE IMPACT OF LACTIC ACID BACTERIA ON RHEOLOGICAL PROPERTIES OF WHEY-PECTIN-BASED EDIBLE COATINGS

Agne Vasiliauskaite ^{1*}, Elvidas Aleksandrovas ¹, Joana T. Martins ^{2,3}, Jorge M. Vieira ^{2,3}, Antonio A. Vicente ^{2,3}, Mindaugas Malakauskas ¹, Loreta Serniene ¹

¹ Lithuanian University of Health Sciences, Veterinary Academy, Department of Food Safety and Quality, Tilzes str. 18, LT-47181 Kaunas, Lithuania

² Centre of Biological Engineering (CEB), University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal

³ LABELS – Associate Laboratory, Braga/Guimarães, Portugal

(*) Corresponding author: agne.vasiliauskaite@lsmu.lt

INTRODUCTION & AIM

Dairy by-product edible coatings are increasingly used to incorporate probiotics into foods. However, the effect of lactic acid bacteria (LAB) on the rheological properties of whey-pectin-based edible coatings are not well explored.

METHOD

This study examined two edible coatings (M and Z), supplemented with *Lactobacillus paracasei* and *Lactobacillus helveticus* (about 7 log CFU/g) (fig. 1). The rheological properties were assessed using a rheometer (300 s⁻¹ shear rate), tensiometer, and contact angle meter.

RESULTS & DISCUSSION

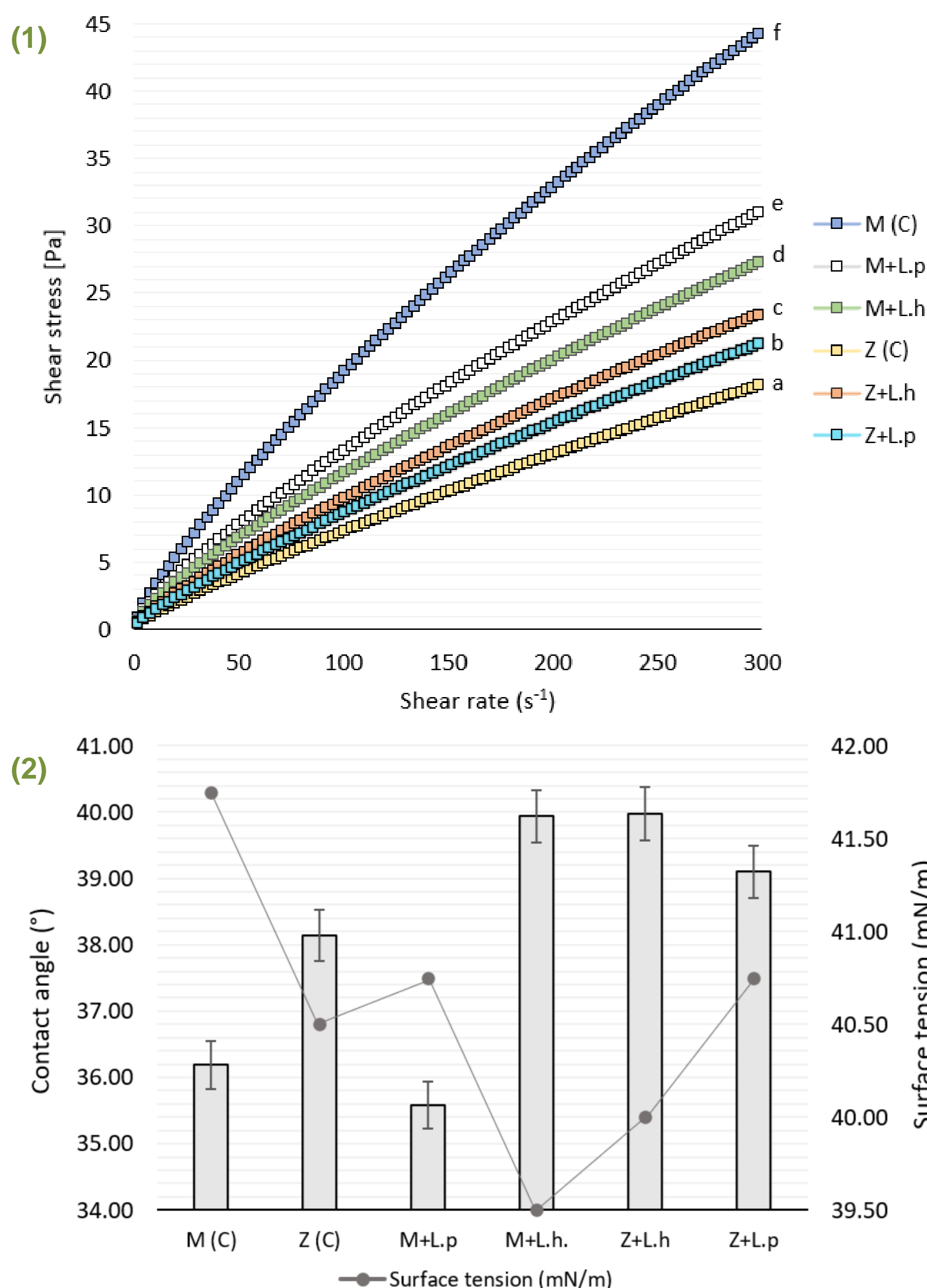


Fig. 2. Flow curves (1), contact angle (bars) and surface tension (dots) measurements of the different coating solutions. M – coating made of liquid acid whey protein concentrate; Z – coating made of liquid acid whey permeate; L. h – *L. helveticus*; L. p – *L. paracasei*. Different letters (a – f) indicate significant differences ($p < 0.05$) between samples

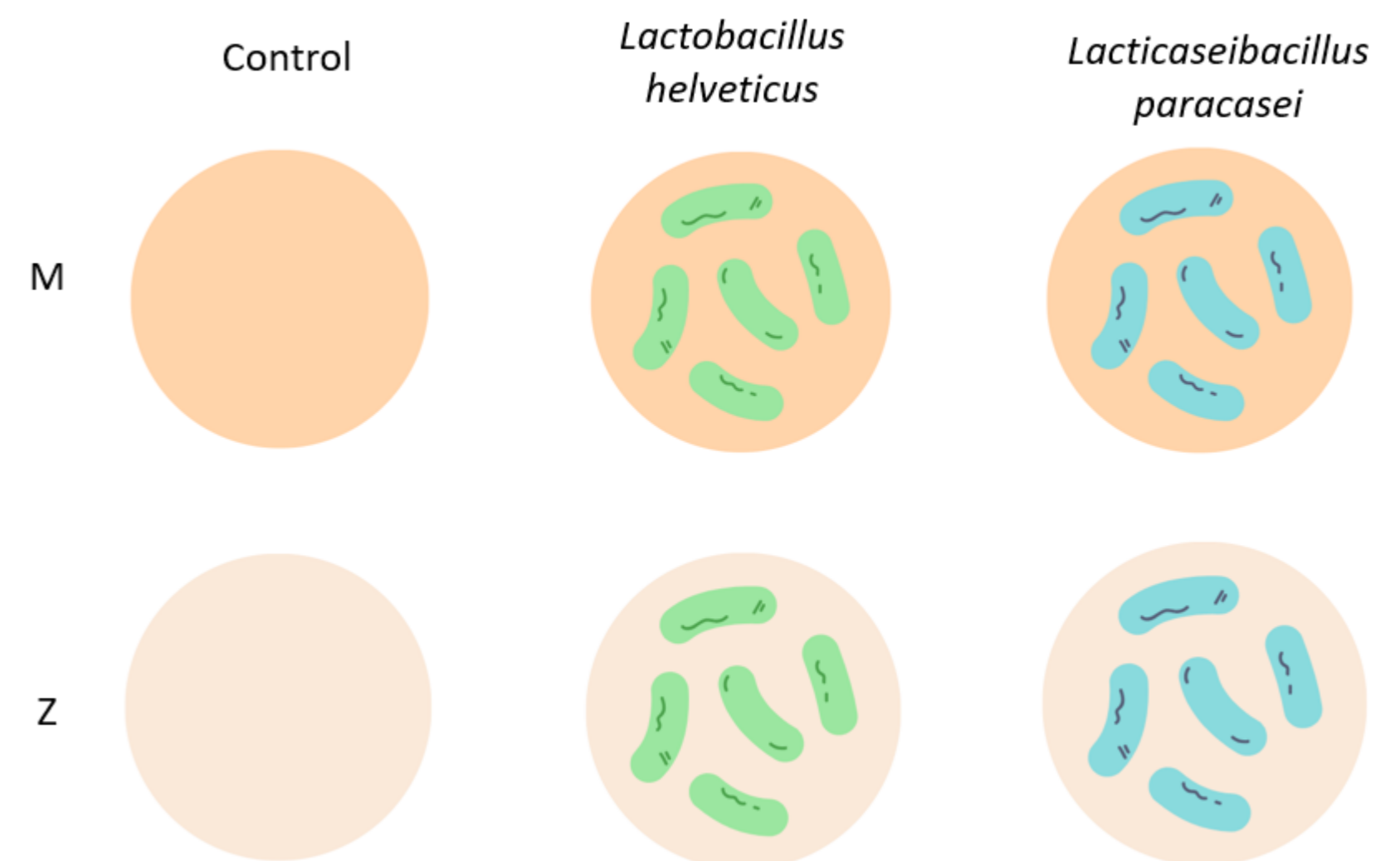


Fig. 1. Whey-pectin-based edible film samples. M – coating made of liquid acid whey protein concentrate; Z – coating made of liquid acid whey permeate

CONCLUSION

The rheological properties, particularly viscosity, varied among samples due to the presence of LAB and differences in LAWPC and LAWPC solid content. However, the base and LAB did not affect surface tension or contact angle results. These findings provide valuable insights for determining the most suitable coating application techniques and highlight the potential of LAB-incorporated edible coatings for probiotic delivery.

ACKNOWLEDGMENTS

The project "The edible coating formulated with liquid acid whey protein and bioactive compounds, and biopackaging for safety and quality of probiotic cheese" (Biocoat) benefits from a 974 thousand € grant from Iceland, Liechtenstein, and Norway through the EEA Grants. The aim of the project is to develop an edible coating formulated with liquid acid whey protein concentrate and bioactive compounds, in combination with biodegradable packaging to ensure safety, extend the shelf life, and enhance functionality of probiotic cheese. Project contract with the Research Council of Lithuania (LMTLT) No is S-BMT-21-10 (LT08-2-LMT-K-01-046).