



APPLICATION OF BARLEY VARIETY 'KORNELIJA' FOR FERMENTED DAIRY PRODUCT DEVELOPMENT

D. Dancite¹, J. Zagorska², T. Ķince², V. Šterna³

¹LTD Orkla Latvija, Miera iela 22, Riga

²Department of Food Technology, Faculty of Food Technology, Latvia University of Life Sciences and Technologies

³Department of Plant Breeding and Agroecology, Institute of Agro Resources and Economic



Introduction

- ✓ The World and Health Organisation predicts by 2030 **cardiovascular diseases** will continue to be the **main cause** of death (*Rushdy Mohamed, etc., 2017*)
- ✓ **Fermented dairy products** containing probiotic bacteria and **reduce cholesterol absorption**, and help ensure **the balance** of “good” and “undesirable” micro-organisms in the gut (*Gahruiet al., 2015*)
- ✓ The recommended intake of **fermented dairy products** is at least **220 g per day** (*Fernandez and Marette 2018*)
- ✓ **Dairy products**, followed by cereal products, take up the largest market share of **functional products** (*Fernandes, etc., 2018*)

High Fiber foods



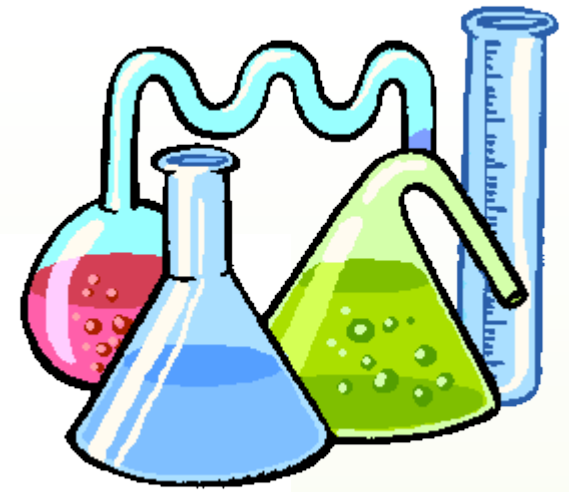
Introduction

- ✓ **High-fibre products** reduce **hypertension, high cholesterol, obesity, gastrointestinal disorders, coronary heart disease, diabetes and oncological diseases** (*Shah et al. 2017; Martínez-Subirà et al. 2020*).
- ✓ Enrichment of yoghurt with **fibre** gives an increased interest in the development of **functional dairy** products in order to provide a favourable effect on **consumer health** (*Fazilah et al. 2018*).
- ✓ **1.32%** of the fibre additive for unsweetened yoghurt improved its **structure, texture and improved the quality of taste and smell** (*Hashemi Gahruie et al. 2015*).
- ✓ The cereals of the hull-less barley variety 'Kornelija' have a unique chemical composition and excellent dietary value

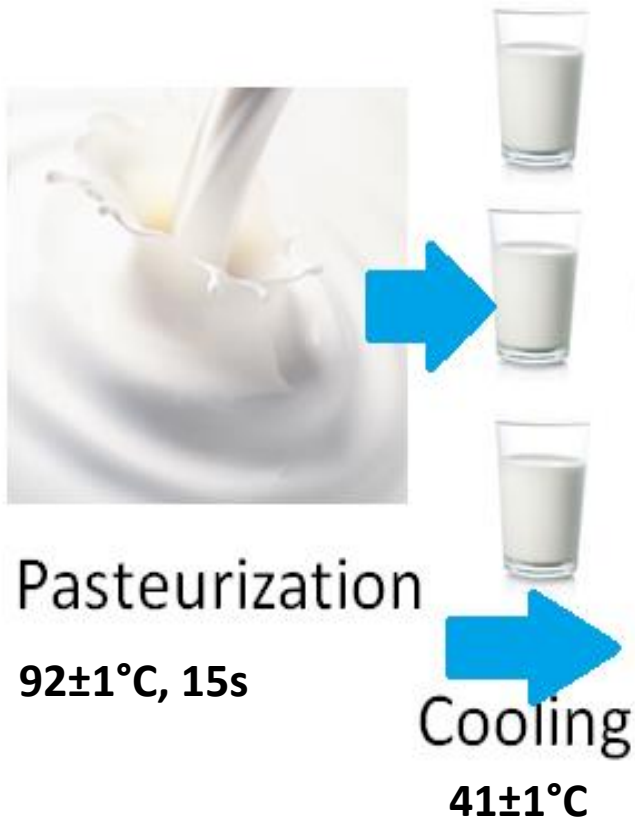
The goal of the current research was to study the application of hull-less barley grains for development of fibre-enriched fermented dairy product



Material and methods



Yo-Flex YF-L811



'Kornelija' 2019
2%, 3%, 4%



24 h
36 h

control

Fermentation

$41\pm 1^\circ\text{C}$
pH 4.8 ± 0.1



Viscosity: rheometer
pH: LVS ISO 5546:2010
Lactic acid bacteria count: LVS ISO 15214:1998
Dietary fibers: AOAC 991.43:1994

Results

Table 1. Chemical composition of barley 'Kornelija'

Parameter	Value, g 100 g ⁻¹		
	Grains	24 h	36 h
Dietary fibres	26.3±1.5a	25.8±1.6a	24.60±1.2a
β - glucan	4.76±0.3a	4.14±0.3b	3.80±0.2c
Starch	58.63±2.9a	58.02±3.1a	55.94±2.8b
Sugars:			
Glucose	1.00±0.2a	3.00±0.3b	3.20±0.3b
Fructose	<0.20a	0.30±0.1b	0.40±0.1c

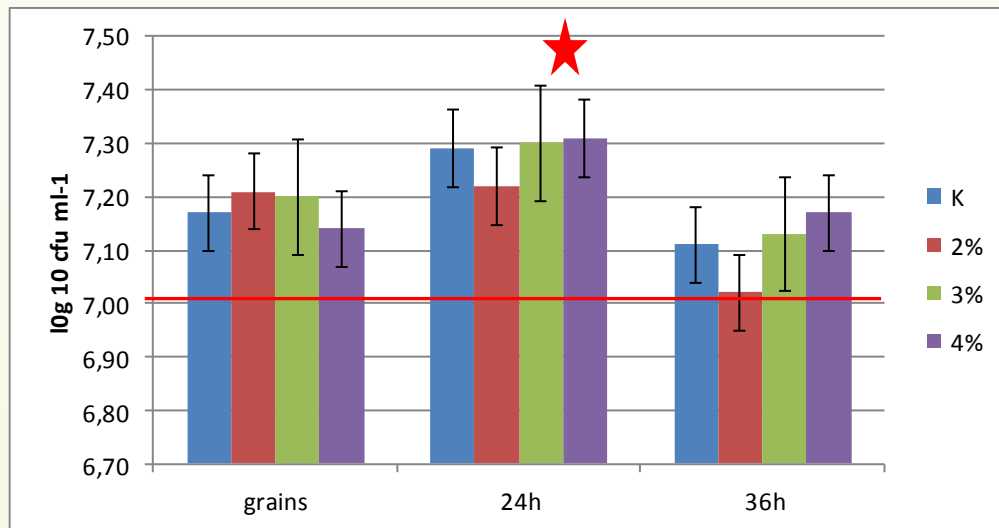
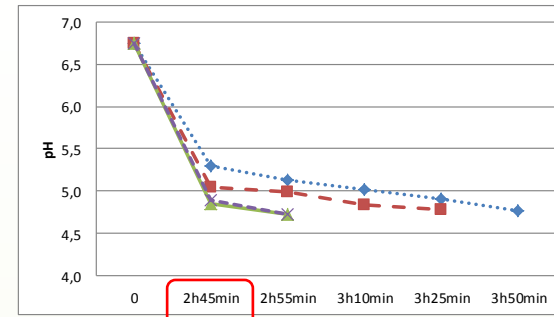
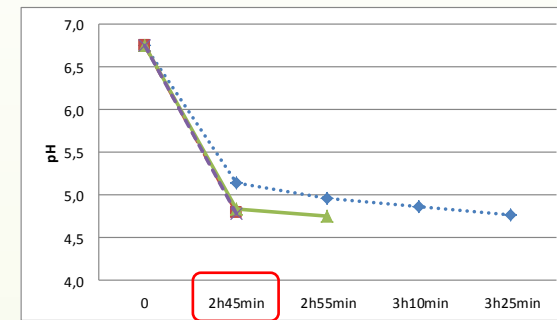


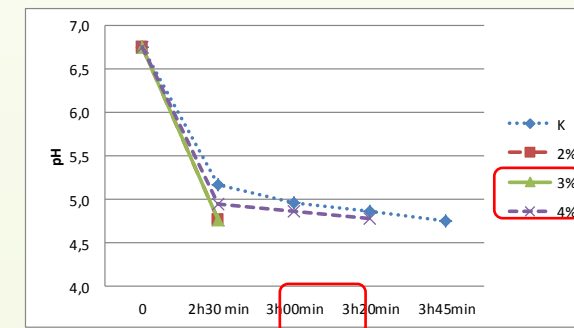
Figure 2. Lactic acid bacteria count in yoghurt samples



Ungerminated grains



24h germinated



36h germinated

Figure 1. pH changes during fermentation in yoghurt

Results

Table 1. Chemical composition of barley 'Kornelija'

Parameter	Value, g 100 g ⁻¹		
	Grains	24 h	36 h
Dietary fibres	26.3±1.5a	25.8±1.6a	24.60±1.2a
β - glucan	4.76±0.3a	4.14±0.3b	3.80±0.2c
Starch	58.63±2.9a	58.02±3.1a	55.94±2.8b

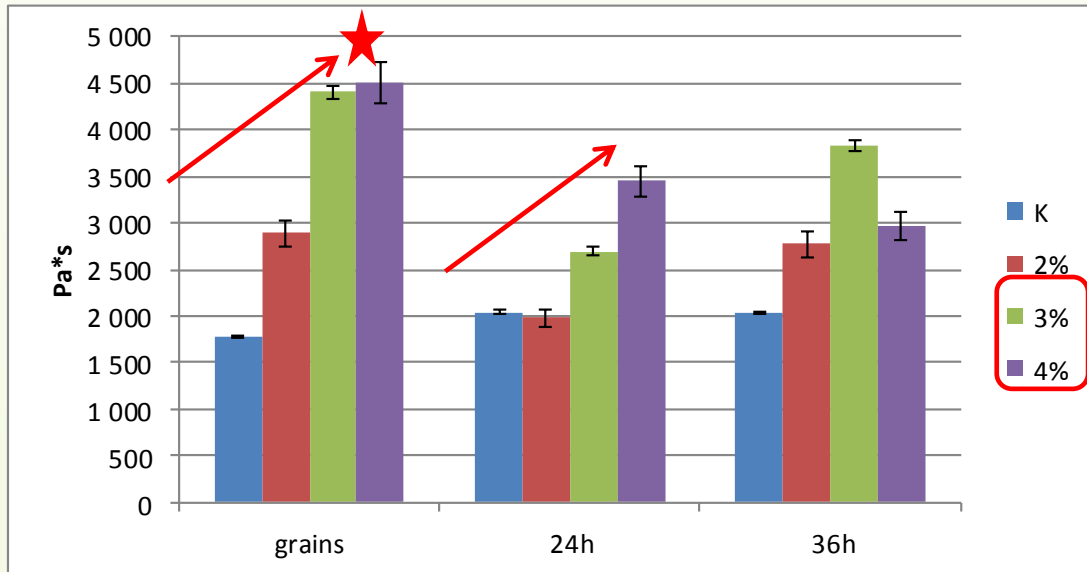


Figure 3. Viscosity of yoghurt samples

Results of the current study show that dried and chopped ungerminated, 24 and 36 hours germinated barley grain, fortifies yoghurt with fiber, promotes growth of lactic acid bacteria in the product, increases the viscosity and shortens fermentation time.