

Impact of fermentation on cereal β -glucan in plant-based yogurt

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1 Motivation & Method



Fig.1 Higher intakes of dietary fibers (DF) and whole grains reduce the risk of several diseases. Despite this, global intakes are estimated to be below recommended levels. In 2020, 1/3 of the total daily energy intake in Europe was coming from animal products. It is estimated that a more plant-based diet would not only reduce environmental emissions but also prevent millions of diet-related deaths.



Fig.2 Oats are rich in β -glucan, a DF recognized by the EFSA for its cholesterol-lowering and blood sugar-stabilizing health effects. It is believed that these health benefits are related to its ability to form a viscous gel which is connected to the length (Mw) of the DF. Food processing can decrease the Mw of β -glucan and therefore alter its functional properties.

The aim was to create a vegan yogurt based on oats and faba beans that is rich in fiber and protein. As comparison, a «low protein, low fiber» recipe was also formulated. At each step of the production process (Fig.3) samples were taken.

The β -glucan was extracted, and its weight average molecular weight (Mw) assessed by size-exclusion chromatography (SEC).



Fig.3 Process scheme for the plant-based yogurt.

2 Results

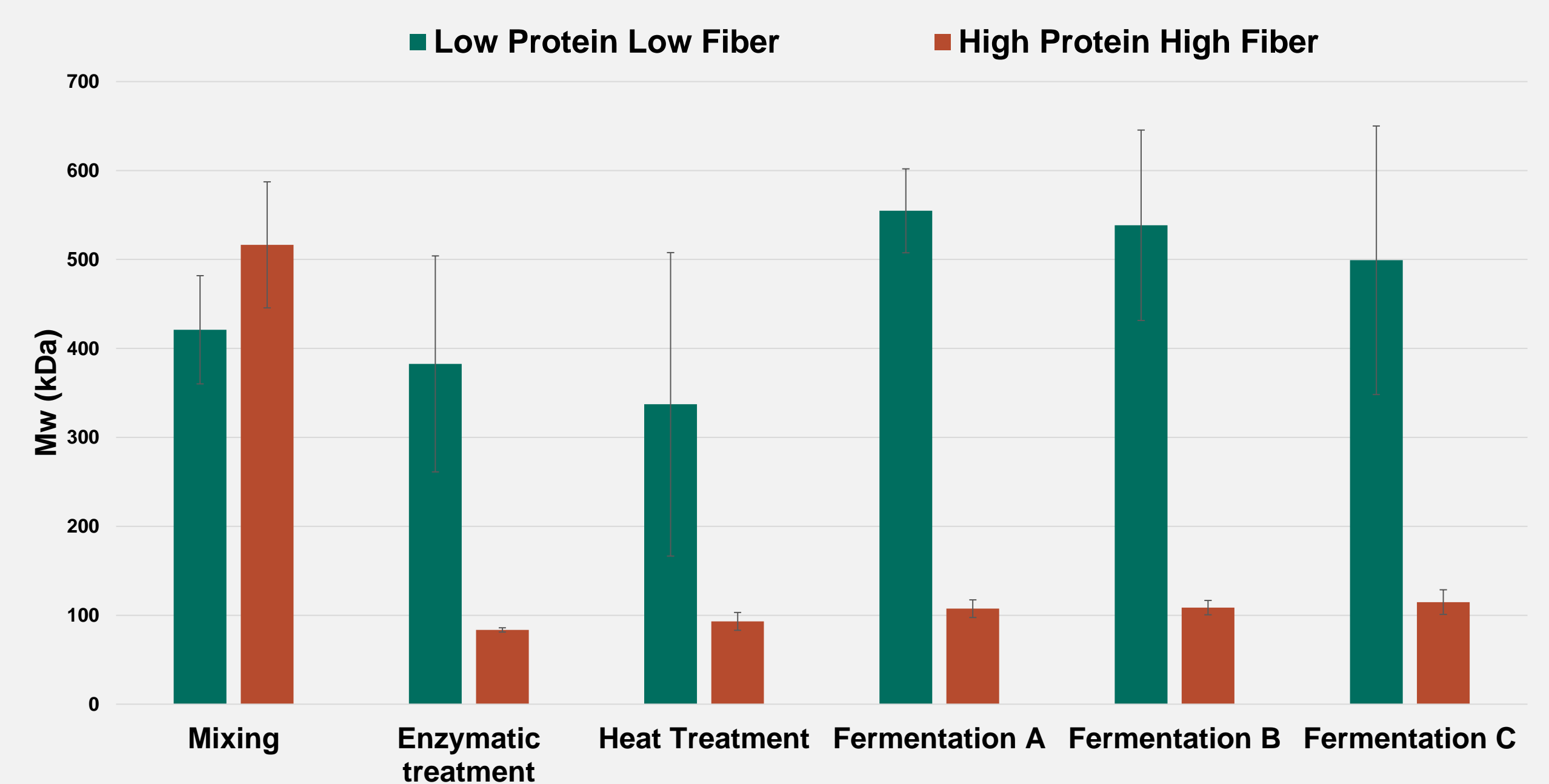


Fig.4 Molecular weight (Mw) in kDa \pm SD (n=3) of the β -glucan extracted from the plant-based yogurt.

3 Conclusion

- Degradation of β -glucan in the “High Protein High Fiber” yogurt from \sim 500 kDa to \sim 100 kDa.
- Degradation mainly due to the enzymatic treatment.
- Fermentation did not lead to further degradation.
- ✓ In the final “High Protein High Fiber” product, β -glucan is still present as polysaccharide (\sim 100 kDa) which is important for its health-promoting properties.

4 Contribution to Sustainable Food Systems

By developing plant-based and fermented foods rich in protein and DF, we are supporting the transition to a more sustainable food system. We also ensure that this transition benefits human health by conducting in-depth research into these new foods, including their impact on consumer health.

