**Stabilization of gluten-free starch-based model systems via arabinoxylan-protein networks**

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The increasing prevalence of gluten-related disorders and the rising demand for gluten-free (GF) products requires innovative strategies to enhance their structural and functional properties. One promising approach involves the network-formation of cereal arabinoxylans (AX) and proteins, facilitated by interactions between their key functional groups (polyphenolics, tyrosine, cysteine). However, the extent of these cross-linking reactions and their influence on the textural properties of GF systems remain insufficiently understood.

In this study, commercially available (c. AX) and self-extracted (s. AX) arabinoxylan extracts (2,6 % based on starch content), along with corn gluten meal (CGM) (3 % based on starch content), were incorporated into GF starch-based systems (pH 5.5, 1:1 ratio of maize starch and buffer, 25 °C) and subjected to enzymatic treatment with laccase (0.5 U/mg substrate). Rheological evaluations, including amplitude (γ=0.01-100 %, 1 Hz) and time sweeps (γ=0.02 %, 1 Hz, 30 min), demonstrated that s. AX exhibited significantly higher storage modulus (G') values compared to c. AX. This indicated greater shear stability and continuous cross-linking over time. The superior performance of s. AX could be attributed to its higher phenolic content, which additionally enhanced the enzymatic cross-linking response, resulting in a more robust and stable network. Additionally, s. AX displayed more effective interactions with CGM than c. AX, further contributing to network formation.

Future research will focus on integrating these AX-protein networks into complex GF dough formulations to evaluate their impact on gas retention, baking stability, and the textural properties of model GF breads.