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Variation of electrical impedance parameters during the soaking of dry crops

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The electrical impedance spectrum of biological tissues depends on the structure and physical properties of the tissue. Dry products soaking takes time - 4-12 hours - operation. To shorten the soaking time, we used ultrasound (40 kHz, 300 W power and 25 °C.), as a result of which it took half as much time to reach the desired swelling ratio (2.00).
The aim of this work is to investigate the structural and quality changes caused by the ultrasonic soaking using electrical impedance spectroscopy.
The magnitude and phase angle of the impedance of the beans were measured in the frequency range of 30 Hz - 800 kHz with an HP4284A precision LCR meter at a measuring voltage of 1 V in an HP16451 B test fixture. To achieve a good electrical contact, an ECG electrically conductive gel was placed between the bean shell and the electrode. Since the hydration of beans is affected by the size of the beans, the impedance spectrum of beans of different size categories (S - small ≤ 13 mm; M - medium = 13-15 mm; L - large = 15-17 mm; X - extra large ≥ 17 mm long) was measured after different soaking times and at the end of soaking.
The impedance decreased by increasing the soaking time, which may indicate that the increased water content reduced the viscosity and thus the mobility of charges increased, which resulted in a decrease in resistance and impedance. The phase angle spectrum shifted to lower frequencies, which in turn may be the result of the destructive effect of ultrasound.

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Physical and chemical analysis of gluten-free pasta enriched with pumpkin-, flax- and grapeseed flour

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With the development of medical science, intolerance to food has developed, thus the recognition of diseases related to the digestion of gluten, along with the need for a gluten-free diet. By using a gluten-free diet, due to the omission of gluten, nutrient deficiencies may occur in the body. Furthermore, must be solved the ensuring the cohesive, texture-improving, and stabilizing properties of gluten-free products, as well as good moisture retention. The objective of the work was to analyze the rheology, color properties, and TPC of gluten-free pasta enriched with pumpkin-, flax- and grapeseed flour. In addition to the control sample without seed flour, the different seed flours were added to the pasta in four concentrations. The seed flour improved the consistency of the pasta and reduced its stickiness, and the flaxseed flour pasta showed the best elasticity and best color retention ability. The highest TPC content was found in the case of grape seed flour while the lowest content was in the case of pumpkin seed flour. Decreasing TPC was measured with the increasing concentration in the case of all three flour samples.