improving the quality of life of these patients. Inulin-type fructans (ITFs) are soluble dietary fiber, and the most studied prebiotic food ingredients. Therefore, the objective of the present study was to use response surface methodology to identify the ITFs and water levels that would maximize the structure, quality and sensory acceptance of GFB formulation. A central composite design was used to assess the interaction between the ITFs and the water levels (independent variables) on the physical properties and acceptability of the GFB (dependent variables). The ITFs ranging from 0 to 30% and water from 69.8 to 110% (flour basis). Optimal ingredient levels were determined from the regression models fitted to the physical properties data [$R^2 > 98\%$, $p = 0.00$] and texture acceptability data [$R^2 = 76\%$, $p = 0.00$]. The optimized formulation contained 30% ITFs and 110% water (flour base) and presented specific volume of 1.2 cm^3/g, moisture of 50%, crumb firmness of 1.8 N and texture acceptability of 8 in a 9-point hedonic scale. Thus, data suggest that ITFs interact with water and produce a gel network structure that serves to increase batter viscosity and to strengthen the boundaries of the expanding cells, increasing gas retention through baking, enhancing the volume and the structural characteristics and texture of GFB. Results also show that ITFs are feasible ingredients in the manufacture of high-quality health GFBs, improving bread quality while providing nutritional and functional benefits to patients with celiac disease.

Effects of inulin-type fructans addition before and after extrusion cooking process on sensory acceptance and glycemic response of corn snacks

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The effects of adding prebiotic inulin-type fructans (ITFs), before and after the extrusion process, on the sensory and nutritional quality of corn-based snacks were assessed. Snack enrichment before extrusion was done by ITFs addition at 13.3% w/w corn grits replacement level. Snack enrichment after extrusion was done using a previously developed flavoring solution enriched with 13.3% ITFs applied on the surface of the product. The use of ITFs caused no damage to radial or volumetric expansion and reduced the shear strength of the corn-based extruded product when compared with the control sample. In experimental conditions, there was 100% ITFs retention during extrusion cooking. The addition of 13.3% ITFs, before or after extrusion, is required in order to obtain a snack enriched with 4 g of ITFs/portion (30 g), a proportion that can provide health benefits. The 13.3% ITFs-enriched snack showed an overall acceptability score (7.1 ± 0.9 for before and 6.6 ± 1.7 for after extrusion), similar to traditional snacks flavored with fatty fixing agent (7.4 ± 1.4). Both 13.3% ITFs- enriched snacks promoted an equal decrease in the snack glycemic index (GI from 81 to 71) and glycemic load (GL from 19 to 15), maintained the characteristics of high GI and moderate GL food. This study demonstrated that it is feasible to add 13.3 % ITFs, before or after the extrusion process, in snack production, yielding a product that combines a physiologically significant supply of prebiotic soluble dietary fiber, high-quality and acceptability. ITFs present low viscosity, which probably did not impair the rheology of the dough within the extruder, making it possible for the expansion ratio to be similar to that of the control snack. However, in order to obtain a snack with a low glycemic impact, another high viscosity soluble dietary fiber should be tested.

Improvement of bread-making properties of waxy wheat

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The low amylose content of waxy wheat flour may be exploited to retard starch retrogradation and therefore to delay bread staling kinetic. However, dough from waxy flours exhibits higher stickiness (that makes it difficult to handle) with respect to non-waxy flour dough. The present work aims at investigating the possibility of improving the workability of dough from two waxy wheat flours of different origin by using them in combination with different percentages (20% and 40%) of commercial flour from non-waxy wheat. Empiric and fundamental rheology of dough was investigated, and the texture of corresponding bread was evaluated. With respect to 100 % waxy flour, the use of blends, with 20% and 40% of commercial flour, allowed a decrease in dough adhesiveness, evaluated as detachment time of the dough from the plate during the test (44% and 55% lower for samples with 20% and 40% of non-waxy flour, respectively). The addition of commercial flour also promoted an increase in farinographic stability (from 3.0 min for 100% waxy flour to 4.5 min and 5.6 min for blends with 20% and 40% of commercial flour, respectively), without affecting starch retrogradation kinetic, as assessed by measuring the consistency of gels stored at 4°C ($F_{max} < 2.8*10^{-2}$ N after 14 days). The G′ and G″ modulus values of dough prepared from flour blends confirmed the elastic-like behavior. The specific volume of bread prepared from blends of either waxy flours resulted significantly higher (5.9–6.9 mL/g) than those of samples from non-waxy flour (5.4 mL/g). Bread made from flour blends containing 20% of non-waxy flour also maintained low firmness values (7.5 N vs. 9 N of 100% waxy flour and 15 N of 100% commercial flour) up to 7 days of storage.

Effect of micronized sugar cane bagasse and water content on the extrusion of rice flour

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The use of byproducts from food industry has been lately considered a new trend, following sustainable practices. Broken rice and sugar cane bagasse, both abundant and from rice millers and sugar-alcohol Brazilian agro industries, were blended with varied sugar cane micronized bagasse content (5-25%). The mixtures were processed in a single screw extruder running at constant screw speed (130 rpm) and two water contents (15 and 30%) producing cylindrical extrudates. The sectional expansion index (SEI) and crunchiness was measured. The extrudates were dried, milled and sieved into flours that were analyzed concerning paste viscosity and x-ray diffraction. SEI values varied from 0.7 to 6.9. A linear reduction of SEI values was found with the addition of sugar cane bagasse ($P < 0.05$) and water content ($P < 0.05$). The textural parameters showed that addition of sugar cane bagasse increased hardness hence reducing crispness. The interaction of water and cane bagasse substantially reduced the cold peak viscosity and the flour from high water and sugar cane bagasse presented the lowest values of viscosity along the paste curve. The original A-type crystals of rice flour changed to either amorphous or E and V type crystals structure showing complete rupture of the rice starch granules and formation of amylose-lipid complexes. The rice/sugar cane extrudates were not suitable as a snack, due to the negative effect on expansion and texture. On the other hand, they would suit as flours for formulating rich fiber products with functional properties.

Bread crumb quality: Correlation between bread crumb structure, texture, and bread volume

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Baking quality is determined through measurement of loaf volume, crumb colour, crumb texture and structure. Bread crumb structures such as cell size, shape, direction of formation and cell wall thickness are typically evaluated by the means of Sensory Evaluation. Calibre Control International Ltd. (Campden & Chorleywood Food Research Association and Calibre Control International, UK) have recently commercialised bread image analyser equipment (C-Cell) to objectively evaluate internal properties of a slice of bread. C-Cell uses high definition imaging and controlled illumination. The whole sample is analysed in fast and simple operation. Data can be used to relate to existing sensory techniques and develop more objective analysis systems. The objective of this study was to investigate the use of C-Cell (bread image analyser) to objectively measure internal quality attributes of pan breads and to investigate the use of C-Cell as a tool for breeding programs to select/discriminate between wheat varieties. In this preliminary study good correlation was observed between the following C-Cell outputs: slice area and number of cells and bread specific volume (calculated using volume measure by seed replacement measure and loaf weight) and crumb firmness (measured using a texture analyser—TA-XT2i Plus) and slice height. In addition the concavity outputs from the C-Cell will be discussed in relation to gluten quality.

Accelerated fouling rates of synthetic thin stillage

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Proteins, carbohydrates, fats and fiber in corn thin stillage are involved in evaporator fouling. Costs associated with fouling include labor and equipment needed to clean fouled heat transfer surfaces, increased capital, antifoulant chemicals and loss of production. Effects of starch (STA) and glucose (GLU) composition in a synthetic thin stillage (STS) fluid on fouling resistance (Rf) were studied. Effects of total solids (TS) content (1 to 10% db) on Rf (m^2K/kW) were investigated at a flow rate of 16 L per minute. Average