



FUNCTIONAL PIGMENTED CORN DOUGH ENRICHED WITH PROBIOTICS

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Introduction. Pigmented maize (*Zea mays*) are part of the biological and cultural diversity of Mexico, its grains vary from pink to deep blue tones (1). In recent years it has been evidenced that components that gives corn its characteristic color represents a source of phenolic compounds, nutraceutical properties and antioxidants, mainly due to their high anthocyanin content. (2). In indigenous communities pigmented corn nixtamalization and fermentation processes have been used for making tortillas and another foods (3).

In this study we examined the possibilities of using probiotic bacteria to ferment pigmented corn dough. The final objective is to obtain raw material with functional and nutraceutical properties.

Methods. A collection of pigmented corn (blue) grown traditionally in the agricultural area of Distrito Federal, Mexico was evaluated in terms of phenolic content and the ability to be nixtamalized. The corn was subjected to alkaline cooking (1% Ca (OH)₂, 95 °C, 15 min, 4 h steeping), the nixtamalized corn (nixtamal) was ground and after was prepared the dough. To promote the growth of lactobacilli were added per kg mass on a wet basis (80%): 0.3 g CaCO₃, 2.0 g hydrolyzate yeast and 0.2 g of potassium sorbate. The pH was adjusted to 6.5 and subjected to a steam cooker (15 lb pressure, 15 min), at room temperature was inoculated with axenic cultures of *Lactobacillus casei*, *L. rhamnosus*, and *L. bulgaricus*, adding 1.5 mg of dry biomass/30 g of dough (4). It was mixed manually to removed excess air and was kept in incubation for 24 h at 37 ° C. The probiotics in fermented dough were verified by plate culture technique on MRS-agar.

Results. The attributes of the corn indicate that it has potential for nixtamalization. Despite the fact that its test weight (63.1 kg/hl) is below that industrially recommended size (74 kg/hl) and corn is a very soft, nixtamal moisture (51.5%) exceeds the recommended for commercial white maize (48%). The results indicate that there was considerable diffusion of alkaline solution into

the endosperm, starch gelatinization and thus increased the nutritional quality (5). The total phenolic content was 7,435 mg/g of corn, greater than those other cereals (6).



Fig.1 Blue corn grown in Distrito Federal, Mexico and appearance of fermented dough containing probiotic bacteria.

After 24 h of incubation *L. rhamnosus* was better adapted to the dough conditions (40×10^7 CFU/mL) compared to *L. casei* (11×10^5 CFU/mL) and *L. bulgaricus* (8×10^5 CFU/mL). More information is needed about the growth kinetics for lactobacillus in the dough.

Conclusions. The pigmented corn dough is a good media culture for *L. rhamnosus* thus increases their nutritional value and is the basis for the development of new products.

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