Production of some high dietary fiber, low sodium Baking products

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Summary and ConclusionProduction of some high dietary fiber, low sodium bakingproducts .First: Utilization offood processing units by-products for producing highfiber content bakery products. So, the following points werestudied:1- Each guava seeds and sugar-beet by-products were usedthrough this study. The used materials were prepared throughwashing, autoctaving, drying and finally milled for obtainingfine powder, then part of it was used as it's as fiber-rich byproduct,and the other one was used for extracting dietary fiber.2- Both guava seeds powder and sugar beet by-product was testedto detect aftatoxins as a secondary metabolites for fungi growth.3- By-Products or its extracted dietary fiber were added to wheatflour (hard or soft) and used for manufacture pan bread andbiscuits to produce high fiber content products.4- Each used material or its extracted dietary fiber was chemicallyanalyzed for protein, ash. Ether extract, crude fiber, totalcarbohydrates and dietary fiber.5..Rheological properties of produced doughs were evaluatedusing farinograph, extensograph, amylograph, zymotachygraphand falling number test.6- Hard wheat flour was partially replaced using 5, 10, 150/0 offiber-rich by-products or 3, 6, 9% of its extracted dietary fiber,then pan bread was produced. Chemical composition, bakingquality and organoleptic tests were determined to evaluate theproduced bread.7- Soft wheat flour was also replaced using the above-mentionedmaterials and high fiber content biscuits was produced andevaluated through its chemical composition, organolepticproperties and baking quality.Second: Reduce sodium content of bakery products. The followingpoints were studied:1- Na, K, and Ca content of both hard and soft flours weredetermined.2- Pan bread doughs usually contain 2%. NaCI - So, for reducingNa content in pan bread, NaCI was gradually reduced as follow:2, 1.5, 1, finally 0.5%.3- Effect of NaCI reduction was studied through, rheologicalproperties of doughs using farinograph, extensograph,amylograph, ZYmotachygraph and falling number test.4- NaCI was partially replaced using KCI or CaCho The replacingprocedure was as follows:a- 0.5% KCl or CaCh + 1.5% NaCI.b- 1% KCI or CaCh + 1% NaCl.c- 1.5 KCl or eaCh + 0.5% NaCI.d- 2% KCI or CaCho5- Effect of NaCl replacement using KCI or CaCh was studiedthrough evaluating rheological properties of doughs usingfarinograph, extensograph, amylograph, zymotachygraph andfalling number test.6- Low sodium content pan bread was produced throughreplacement ofNaCI with KCI or CaCh according to the abovemontionedprocedure and the bread was evaluated throughevaluating baking quality and organoleptic properties of bread.7- Sodium chloride was reduced in biscuit doughs as follows:(l,0.75, 0.50,0.25 and 0.0%) and the effect ofth.e reduction wasstudied through rheological properties using farinograph,extensograph, amylograph, zymotaehygraph and falling numbertest.8- NaCI was replaced with KCI or eaCh according to thefollowing procedure:a- 0.25% KCI or CaCh + 0.75% NaCl.b- 0.500/0KCl or CaCh + 0.50010NaCl.c- 0.25% KCI or CaCh + 0.75% NaCI.d- 1% KCI or CaCho9- The effect of replacing of NaCI using KCl or eaCh wasevaluated through rheological properties determination usingfarinograph, extensograph, amylograph, zymotachygraph and .falling number test.10- Low sodium content biscuit was produced according to theabove-mentioned procedure and the produced biscuit wasevaluated through determination its baking quality andorganoleptic properties.The obtained results showed that:First: Effect of using fiber-rich by-products or its extracted dietary fiberon the rheological, physical, chemical and organoleptic propertiesof produced bread and biscuit. As obtained results revealed:1- Aflatoxins was not

detected regarding all tested material (wheatflour, guava seeds, sugar beet by-product and its extracteddietary fiber).2- As chemical composition revealed, hard wheat flour had highercontent of protein, ether extract, ash.,.,crude fiber and dietaryfiber, than soft wheat flour. Regarding the chemicalcomposition of by-products or its extracted dietary fiber guavaseeds had higher content of crude fiber and dietary fiber.3- As rheological properties tested using farinograph, hard wheatflour dough had higher water absorption, dough developmenttime, and stability than that of soft wheat flour. Doughcontaining by-products or its extracted dietary fiber had higherwater absorption, lower stability than that of control sample.4- As revealed by extensograph test, hard wheat flour dough hadhigher. extensibility, resistance to extension, and energy thanthat of soft wheat flour dough. As by-products or its extracteddietary fiber increased, extensibility decreased, but resistance toextension increased. The same trend was observed in hard andsoft wheat flour.5- According to zymotachygraph results total and retained gasdecreased as by-products or its extracted dietary fiber increased.The same trend was observed in both hard and soft wheat flourdough.6- As rheological properties evaluated using Amylograph test, themaximum viscosity decreased as dietary fiber increased indoughs. The same trend was detected in both hard and softwheat flour.7- As falling number test revealed, falling number decreased asby-products or its extracted dietary fiber increased. The sametrend observed in both bard and soft wheat flour dough.8- As chemical composition of the final products revealed, ash,crude fiber and dietary fiber increased as guava seeds or sugarbeet by-products or its extracted dietary fiber increased.9- Baking quality and organoleptic properties decreased as byproductsor its extracted dietary fiber increased. The same trendwas observed in both bread and biscuit Pan bread containingdietary fiber had lower volume and higher weight, while biscuitcontaining dietary fiber had lower volume and spread ratio thanthat of control one.As mentioned before, as fiber increased bread and biscuitquality decreased. The by-products could be added to wheatflour up to 5% and extracted dietary fiber up to 3% to produceacceptable bread or biscuit.Second: Effect of replacement of NaCI with KCl or CaCh on panbread or biscuit quality. The obtained results revealed that:1- Hard wheat flour had higher content ofNa, K, and Ca than thatof soft wheat flour.2- As recorded by farinograph test, water absorption decreased assalt level increased and stability increased regardless of salt orflour type.3- According to extensograph test, extensibility decreased andresistance to extension increased as a result of the presence ofsalt regardless of salt type and the replacement ofNaCI withKCl or eaCh had no clear effect. The same trend was observedregarding soft and hard wheat flour.4- As recorded by zymotachygraph test, total and retained gasdecreased, as salt level increased. The replacement ofNaCI byKCl or CaCh had no clear effect The same trend was observedconcerning hard and soft wheat flour.5- Regarding amylogrph test, as salt level increased, maximumviscosity decreased regardless of salt type or replacing ratio.6- Falling number test revealed that falling number decreased assalt level increased. The same trend was observed in both hardand soft wheat flour.7- As replacement ratio increased, the replace mineral contentincreased in the final product as revealed through mineralcontent determination.8- Baking quality and organoleptic properties tests revealed thatthere was no clear difference as a result of partially replacementof NaCI or CaCh, but used CaCh or KCI instead of NaClcaused clear adverse affect of the final product concerningbaking quality or sensory evaluation. As mentioned before itcould be concluded that:1- Guava seeds powder, sugar beet by-products and its extracteddietary fiber are suitable for high fiber bread or biscuitregarding aflatoxins test. Additional to recycling of by-productsof food processing units is desirable trend regardingenvironmental pollution.2- Guava seeds or sugar beet by-products can use up to (5% flourweight basis) and its extracted dietary fiber can use up to 3%.3- NaCl can replace using KCI or CaCh up to SOOk for producinglow sodium bread or biscuit regarding sensory evaluation andbaking quality of the final products.