Studies on production of some types of pastry

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A wide range in puff pastry end products quality depend on the composition of the paste, quality of flour and fat and subsequent processing.*This study was included four main parts:Part 1: Effect of flour types properties on the puff pastry and other bakery products quality.Part 2: Effect of shortening types on the puff pastry quality. Part 3: Effect of some flour modifiers on the puff pastry quality.Part 4: The possibility of using a natural source of preservative substances. Part- 1: Effect of flour types properties on the puff pastry and other bakery products quality:Ten samples of American soft red winter wheat varieties flour (SRW), eight samples of American hard red winter wheat varieties flour (HRW) and a commercial flour (Flourland) as control were analyzed for their chemical composition, protein fractions and rheological properties. Some bakery products were also prepared from these flours and evaluated for their physical properties and sensory characteristics.1-Chemical properties of wheat flour samples:1-Moisture, protein, ash, and wet gluten (W.G) contents of soft red winter flour (SRW) were ranged from 10.4 to 13.1%, 7.29 to 10.65%, 0.33 to 0.45% and 17.7 to 29.5%, respectively, in comparison with 11.69 to 13.65%, 8.19 to 10.65%, 0.32 to 0.43% and 23.5 to 32.8% for the same components of hard red winterwheat flours. While the same components were 14.0%, 14.1%, 0.49% and 42% for the commercial flour, respectively.2-Mineral contents were evaluated for two soft, two hard-red winter wheat flours and the commercial flour. Mineral contents varied between the samples of wheat varieties from 15.46 to 30.2 mg Magnesium (Mg), 2.39 to 4.51 mg Sodium(Na), 0.52 to 1.10 mg Zinc(Zn), 0.0 to 0.4 mg Manganese (Mn), 1.64 to 3.14 mg Iron(Fe), 20.54 to 50.3 mg Calcium(Ca), 134.8 to 203.2 mg Potassium (K)and 0.25 to 0.64 mg Copper (Cu).2-Identification of protein fractions of wheat flour samples:Protein of defatted wheat flours were separated and identification of molecular weights of separated fractions using sodium dodecyl sulfate polyacrylamide gel electrophoresis SDS-PAGE. The obtained results could be summarized in the followingpoints:1-The protein of defatted soft red winter wheat flours were fractionated into 14 to 20 fractions, with molecular weights from 15 to 92 KDa. whereas, protein of defatted hard red winter wheat flours were fractionated into 14 to 22 fractions, with molecular weights from 16 to 126 KDa, comparison with 21 fractions and molecular weights from 16 to 126 KDa for commercial flour.2-The amounts of Albumin and globulin (A&G) with molecular weights from 15 to 20 KDa of soft red winter wheat flours varied from 19.4 to 36.3% of total protein and those amounts varied from 19.6 to 26.1% of total protein for hard red winter wheat flours, compared with 18.9 % for commercial flour.3-The amounts of a, 0, y-Gliadin and low molecular weight glutenin (LMW) with molecular weights from 25 to 51 KDa of soft redwinter and hard red winter wheat flours were ranged from 58.5 to 80.7% and 55.5 to 68.8%, respectively, compared with 61.4% for commercial flour.4-The amounts of co-Gliadin with molecular weights from 60 to 80KDa from 0.0 to 7.28% for soft red winter wheat flours and from 5.98 to 14.3% for hard red winter wheat flour, whereas, it was14.5% in the commercial flour.5-The high molecular weight glutenin (HMW) with molecular weights from 90 to 150 KDa from 0.0 to 1.75% for soft wheat flours and between 4.58 to 9.98% for hard wheat flours comparison with 5.04% for commercial flour.6-The soft red winter wheat flours were contained high percentage of albumin and globulin (A&G) and a-,J3-,y-gliadin and low molecular weight glutenin (a,f3,y& LMW), whereas, the hard red winter flours and commercial flour were contained high percentage of co-gliadin (co-gliad) and high molecular weight glutenin (HMW-Glut.).7- The similarity percentage was 78.68% between soft red winter flours, 73.68% between hard red winter flours and 78.75% between commercial flour (Flourland) and hard red winter flours. The similarity between soft

red winter flours and hard red winter flours was 55.88%.3- Rheological properties of wheat flour samples:1- The falling number values of soft red winter wheat flours and hard red winter wheat flours were varied between 324 to 455 sec. and 401 to 490 sec.; respectively, whereas, it was 405 sec. for the commercial flour.2-Water absorption, arrival time, dough development time, stability and degree of weakening values for soft red winter wheat flours were varied between 51.1 to 55.8%, 0.5 to 1.0 min, 1.0 to 2.0 min, 1.5 to 8.0 min and 70 to 150 B.U., respectively. While for hard red winter flours were between 57.4 tO 61.8%, 0.5 to 1.0 min, 1.0 to 2.0 min, 4.0 to more than 28 min and 0.0 to 90 B.U.; respectively. The same parameters were 69.1%, 1.5 min, 3.0 min, 10.0 min and 55 B.U.; respectively, for commercial flour (Flourland).3-Resistance to extension, extensibility, proportional number (R/E) and energy for soft red winter wheat flours were varied between 180 to 615 B.U.; 130 to 174mm, 1.24 to 3.92 and 33 to 99 cm2, respectively and were between 350 tO 555 B.U.; 127 to 160 mm, 2.46 to 3.77 and 57 to 88 cm2, respectively, for hard red winter wheat flours. whereas, the same parameters were 685 B.U.; 142 mm, 4.82 and 98 cm2, respectively, for commercial flour (Flourland).5-Evaluation of bakery products produced from hard, soft wheat and a commercial flours:1-The results showed that generally hard red winter wheat flours and commercial flour were suitable for pan bread, croissant pastry and puff pastries. These flours were characterized by protein percentage (from medium to high), high protein quality (wet gluten/protein %), high percentage of HMW-glutenin subunits and w-gliadin subunits, high dough stability, high resistance to extension, high extensibility and high energy (80-100 cm2).2-Flat bread made from the commercial flour (Flourland) , SRW8, SRW 10 and HRW6 showed the highest overall acceptability3-The samples of soft red winter wheat flours were suitable for production of biscuits with highly acceptability.5-Effect of protein fractions, protein % and protein quality(wet gluten/ protein %) as (independent variables) on dough rheological properties and some main characteristics of pan bread and puff pastry as(dependent variables):1-The quantitative of HMW-glutenin subunits has been shown to be closely related to water absorption, dough stability, degree of weakening, overall acceptability of pan bread and both pastries height and its specific volume.2-The quantitative of e)-gliadin subunits has been shown to be closely related to water absorption.3-Protein quality has been shown to be closely related to degree of weakening, resistant to extension and energy.4-The percentage of protein has been shown to be closely related to energy. Part- 2: Effect of shortening types on the puff pastry quality:1-Physicochemical properties of shortening types:1-The melting point and moisture contents of butter, margarine and palm oil derivatives were 32, 35 and 38°C and 15.5, 18.3 and 0.5%, respectively.2-Butter characterized by its higher containment of low chain fatty acids (Butyric, Caproic, Caprylic) than margarine and palm oilderivatives.3- The results also indicated that palm oil derivatives contained the highest total amount of long chain fatty acids (from 14 to 18carbon atoms) such as Myristic, Palmtic, Stearic, oilic, linoleic acids.2-Effect of different types of shortening on the sensory characteristics and physical properties of puff pastry products:1-The use of margarine resulted puff pastries with highest score values of overall acceptability , pastry height, specific volume.2-Palm oil derivatives had a deleterious effect on the puff pastry properties.3-Butter showed the highest score values for crust color, taste, odor, crust appearance and eating quality of puff pastry, but the temperature of the paste need to be kept cooler to maintain the right consistency.4-The type of shortening had a high significant effect on the physical properties of puff pastry (height and specific volume).3-Effect of fat (margarine) levels as a role-in and the number of folds on the sensory characteristics and physical properties of puff pastry products:1- The use of the fat at levels 50, 70 and 80 % as a role- in produced puff pastries of satisfactory quality grade, whereas, level 25% showed unsatisfactory quality grade.2-The fat percentage, number of folds and the reaction between them had a high significant effects on the puff pastries height and its specific volume.159 Part-3:Effect of some flour modifiers on the puff pastry quality:1-Effect of some flour modifiers on the rheological properties of the commercial flour :1-The effect of levels, 100 mg of coated ascorbic acid, 1000mg of egg-lecithin, 300 mg of diacetyl tartaric ester of mono- glycerides (DATEM) and 100 mg malt /100 g of flour on the rheological properties of dough, were determined using farinograph and extensograph. tests2-Water absorption decreased by adding these modifiers.3-Dough stability, resistance to extension, proportion number and energy values were increased by adding ascorbic acid and by adding the flour modifiers mixture. Degree of weakening

and extensibility were decreased by the same previous additives.4-Egg-lecithin, DATEM and malt showed lowest resistance to extension, highest extensibility and moderate values of dough stability and energy and these parameters gave high quality of puff pastry overall acceptability, pastry height and specific volume.2-Effect of some flour modifiers on the sensory characteristics and physical properties of puff pastry products:1-The levels, 100mg of uncoated ascorbic acid, 100 mg of coated ascorbic acid, 1000mg of egg-lecithin, 400 mg of diacetyl tartaric ester of mono- glycerides (DATEM) and 100 mg malt /100 g of flour, were the best levels to produce puff pastry with high sensory and physical characteristics desired for these products.2-The use of mixture of 60 mg of coated ascorbic acid, 1000 mg of egg-lecithin, 300mg of diacetyl tartaric ester of mono-glycerides(DATEM) and 100mg of malt / 100g of flour, showed the highest enhancement in sensory characteristics and physical properties of puff pastries.3-Egg-lecithin (1000mg /100g flour) and malt (100mg /100g flour) were the most effective as flour modifiers on puff pastries quality. While, high levels of egg- lecithin and malt had a deleterious effect on puff pastries quality.3-Stability of ascorbic acid types (Vitamin C) during puff pastry manufacture and its storage period of puff pastry.Coated-ascorbic acid was more stable than uncoated-ascorbic acid during puff pastry manufacture and its storage period. Part-4: The possibility of using a natural source of preservative substances:The purpose of this investigation was to screen some extracts for antimicrobial activity.1-Chemical composition of Karkade (Hibiscus sabdariffa), Propolis and Damssissa (Ambrosia maritima. L):1-The moisture, protein, ash ether extract contents of Damssissa were 8.0%, 12.61%, 19.3% and 2.16 (on dry weight basis), respectively. whereas, Propolis contents of the same components 10%, 0.7%, 13.8% and 38.36%, respectively. The same components were 6.5%, 11.15%, 9.55% and 1.87%, respectively, for Karkade.3-Darnssissa contained the highest amount of protein, ash, Magnesium (Mg), Sodium (Na), Zinc (Zn), Manganese (Mn), Calcium (Ca) and Copper (Cu), whereas Karkade contained the highest amount of Iron (Fe) and Potassium (K).161,2-Thin layer chromatograph (TLC) investigation of organic constituents present in the extracts of Damssissa , Karkade and Propolis:All ethanol extracts of Propolis, Damssissa and Karkade were rich in many natural boiactive components, which may be suitable for use as antimicrobial, pest control agent or antioxidant agent such as flavonoids, sterols and/or triterpenes, tannins, coumarins and saponins.3- The inhibitory effect of the extracts of Damssissa , Karkade and Propolis against fungus activity :1-The ethanol extract of the mixture of Propolis and Karkade at volume (240 and 400 mg) strongly inhibited the growth of the test organisms.2-The ethanol extracts of Propolis, Damssissa and Karkade had effects varied between from low to moderate againest the activity of the three test fungus at levels (240 and 400 mg).4-Effect of Damssissa , Karkade and Propolis extracts on the shelf life of puff pastry:Ethanol extracts of Damssissa, Karkade and propolis at level 400 mg of extracted material/100g flour had the same (or best) effect of sodium propionate on retardation the growth of microorganis in stored puff pastries.