Some technological and chemical studies on proceeesd cheese

Mohamed Eid Abd Allha Shenana

Cheddar cheese is considered as the most raw material imported to Egypt for the manufacture of processed cheese products, and the total cost isvery high. Locally made hard cheese known as Ras cheese used in theprocessing, and this type of cheese is expensive. For this reason, manyresearch work had been done looking for alternative raw material instead ofnatural cheese to reduce the capital cost including the time for preparing thenatural cheeses used in manufacture of processed cheese products.In this study the research work was planned to produce a gel from UFretentateSMP to be used as a raw material instead of natural cheese. Alsousing of HP-RSMP in manufacture of developed processed cheese spreads.Thus, this work was divided into two parts :Firstly. a survey was conducted on eight processed cheese spreadsamples which were available in the Egyptian markets. Four brands wereimported and the rest were locally made. Consequently, 29 samples ofprocessed cheese spreads available in the UK (Scotland) markets were alsosurveyed. All the samples were analysed chemically, and the processedcheese, spreads available in the UK markets were also evaluatedorganoliptically In order to Identify the sensory attributes to characteristic ofprocessed cheese spreads and for using such sensory scheme to evaluate ofthe experimental products. The moisture content of Scottish full-fat processedcheese spreads ranged between 49.9 and 59.2g 100g·'. The moisturecontent (g 100g·') of the locally made and imported processed cheesespreads in Egypt ranged between 51.2 and 58.7, and 47.8 and 53.4,respetivelly. All the Schottish and Egyptian products were within the nationalstandard, i.e. s 60 and s 65g 100 g.', respectlvelly (Statuary Instruments (51),1970, 1974; Egyptian Standard, 1970). The FDM content of the Scottish andEgyptian products averaged 47.6 and 62.5g 1COg.',respectively where theseresults met both the 51 (1S70, 1974) and Egyptian Standards (1970) i.e. 2: 45and ~ 20g 100g"1, respectively. It was evident that the Egyptian cheesescontain more fat when comared with the Scottish products. The protein,carbohydrate and ash contents of processed cheese spreads varieddepending on the ingredients that have been used in the formulation of theproduct. The pH values of the Egyptian locally made processed cheesespreads varied from 5.18 to 5.92, but for the imported products rangedbetween 5.95 and 6.32. However, the pH values of the UK processed cheesespreads ranged between 5.36 and 5.99. The moisture content of low-fatprocessed cheese spreads which were available only in the UK rangedbetween 50.77 and 68.15g 100g"'. The fat content ranged between 6.7 and16.4g 1oog"' with the exception of one sample (ultralight) where the fatcontent was 2.9g 100g"'. The protein content ranged between 13.1 and 19.1g100g" which were high when compared with the protein content in full·fatprocessed cheese spreads. The sensory attributes that have been identifiedby trained panellist were six terms for flavour (overall intensity, creamy, salty,acid I sour, buttery and bitter), two terms describing after-taste (intensity endpersistence) and five attributes encompassing texture and mouth feel (grainy,sticky, mouth-coating, melt in the mouth and fatty I greasy). The sensorycharacter of all the commercial processed cheese spreads is influenced by the fat content. However, these differences ere confined to sensorydimensions associated with texture and mouth feel. Furthermore, within somebrands· the effect of reducing the fat content was minimal. Thue results wereprobably achieved by other changes in the product formulation,Secondly. UF-retentate was produced from reconstituted SMP forproducing full- and low-fat developed processed cheese spreads. HP-RSMPwas also used to

produce both types of developed processed cheesespreads (full- and low-fat).The experimental cheeses were evaluated chemically,microbiologically, sensory and rehologically, the results were as follows:The retentate was prepared from reconstituted SMP (20g 100 g” TS) at 45-sooe, and ultrafiltrated using pilot scale equipment. The UF-retentate wasdivided into four equal portions and mixed with emulsifying salt (JohaQ!lFN) at a rate of 2g 100 g” .• The first batch no other ingredients was added.• Batches 2, 3, and 4, fat-SUbstitutes ware added at the following rates (g1OOg”) : (a) PaselliQ!lExcel (1.5) + Farinex fbvA 60T (0.5), (b) Dairy-LO’” (2)and (c) SimplesselP.l100(2). A hand whisk and a high speed mixer were usedto mix the above ingredients, and later stored over night (14 - 16h) at 5 - 7°C.On the following day, the gel was used to replace the natural cheese for theproduction of developed processed cheese spreads.The gel was prepared from the HP-RSMP, where the powder wasrehydrated in water at - sooe at a rate of -18g protein 100g” and theproduction of the gel was similar to the method dellClibed above. Incidentally,when high protein SMP was used, the emulsifying salt and fat-substituteswere blended with powder prior to rehydration.Each type of gel mentioned above and other Ingredients, wert mixedfor making developed procelsed cheel. .p •.•• d.. All the chea•••• mpl••were stored at - 5°e for duration of four m:mths and analyatd when WI’fresh, 2, 3 and 4 months.The chemical analysis for the full-fat products clearly identified thatthere was some variation in the compolition, but were within the Egyptianstandard. The moisture content ranged between 52 and 59g 100g”, the fatcontent ranged from 22.0 to 23.3g 100g’” and the pH levell avarage 5.8which was atYPicalfor produce processed cheese spreeds. However, in caseof low-fat products there was high variation between the products made fromUF-retentate and the products made from HP-RSMP. The moisture content oflow-fat products made from UF-retentate ranged between .59.9 and 61.9g1COg” and the fat content ranged between 11.1 and 12.9g 100g·’. However,in the case of low-fat products made from HP-RSMP the moisture content167ranged between 64.8 and 66g 1OOg,land the fat content was averaged 13.0g100g,l.The microbilolgical examination of the expermental cheeses indicatedthat all the products were of good quality during the storage period, but therewas variation in the microbial count. The products made from HP-RSMP werehigh in the microbial counts than the products made from UF-retentate due tofact that such powder had initially high microbial counts.The sensory evaluation of the produced processed cheese clearlyindicated that all the experimental products were acceptable and there wasno defect during the storage period.The rehological properties (firmness, stickiness, cohesiveness andspreadability) indicated that the experimental products were more or lesssimilar to the commercial products (control).The statistical analysis was carried out on the organoleptic results inorder to study the differences between the commercial and the experimentalproducts. from these statistical analysis the commercials were segregatedfar from the experimental products. The sensory data were reanalysed for theexperimental products and it was clear that the products made from UFretentateeither with AMF of fat-substitutes with exception of the productmade with Paselli® (starch base) were closely related each to other, and a/sothe product made from rehydrated high protein SMPwith added AMF wassimilar to the UF-retentate products. However, the products made from HPRSMPwith fat-substitutes were far from the products made from UFretentate,but were closely related to each other.from such a study it can be concluded that developed processedcheese spreads were successfully produced either from UF-retentate or HPRSMP’without using natural cheese and fat-substitutes, and these productswere of good quality.