Technological studies on smoked cheese

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Smoking of food and food products is a common and old process, and one of the best ways to keep food from spoiling where wood smoke contains substances that inhibit the growth of spoilage organisms and thus improves the keeping quality of the product, and also imparts an agreeable tast and appearance to foods. This work was carried out to study the possibility of production of smoke solutions from different wood sources. The liquid smoke was then subjected to a clarifying processes, whereby the deleterious substances were removed to considerable extent and the agreeable components which impart smoke tast and flavor were retained. This clarified liquid was then applied to cheese.The investigation was carried out in three parts:- Part I: Survey study on market smoked cheese. In this part, the chemical composition and microbiological quality of surveying smoked cheese in local market was studied.The results can be summarized as follows•The chemical analysis of cheese samples included, moisture, fat, salt, pH, acidity, T.N., S.N., N.P.N., carbonyl, phenol, benzo(a)pyrene, tyrosine, tryptophan and T.V.F.A. were studied. These components were nearly within the common values of cheese. The ripening indices showed a wide variation among the different cheese types, also the cheese samples were characterized by the higher values of benzo(a)pyrene content.•The microbiological analysis of the tested cheese showed higher total count, and slightly lower counts of protoolytic and lipolytic organisms. Coliform group were not detected in cheese samples except in Farm cheese which counted 30 c.f.u./g.•The organoleptic properties revealed that the ”Bayeralan” smoked processed cheese had the higher score point (91.3) followed bysmoked processed cheese (Kopper Kakase, Holland) (89.01), Prima light cheese (77.6) and Farm cheese (69.6) respectively. Part II: Preparation of smoke solution from different woodspecies to be used in cheese smoking.The results of this part were as follow:- Section ”A”: The smoke composition prepared from different wood species.Smoke solutions were prepared from different sources of wood (Mousky, Prunus armeniaca (Apricot), Psidium guajava (Guava), Populous alba (Abele), Prunus salicina (Plum) and Citrus sinensis (Orange). The resultant smoke solution was tested chemically for carbonyl, phenol, benzo(a)pyrene, pH, acidity, total solids and density. The best smoke solution was that prepared from Mousky wood as it contain the highest values of flavor compounds as carbonyl (3.57 mg/ml) and phenol (1.12mg/m1), also it recorded the lowest value of known carcinogenic substance as benzo(a)pyrene (3.29 1..tg/m1). Therefore Mousky smoke solution was used for the next section of thispart. Section ”B”: Effect of clarification methods and aging time on the properties of smoke solution prepared from Mousky wood.The resultant Mousky smoke solution was purified by filtration with cotton, Wattman paper No. I, centrifuging at 1500 and 3000 r.p.m./ 20 min., filtration with cotton + centrifuging at 3000 r.p.m./20 min. to minimizing the carcinogenic substances represented in benzo(a)pyrene. The best treatment among the purification methods was (filtration with cotton and centrifuging at 3000 r.p.m./20 min.) as the benzo(a)pyrene decreased by 60.49%.The control and purified solutions were then aged at room temperature and at refrigerator for 60 days. It was found that aging decreased the benzo(a)pyrene content of smoke solution, and aging at room temperature was more effective in this respect. Clarified smoke solution by (filtration with cotton + centrifuging at 3000 r.p.m./20 min.) was more stable during aging among the other solutions at room temperature or in refrigerator, as the loss of flavor compounds (carbonyl and phenol) were at its lowest value. Part III: Effect of using different smoking methods on thechemical, microbiological and sensory evaluation ofDomiati like cheese.In this part, the best smoke solution (filtration with cotton + centrifuging at 3000 r.p.m./20

min.), smokEZ C-6 and direct smoking were applied to cheeses (salted with 3% in retentate or salted in 20 % brine solution for 4 h.) by immersing in smoke solutions for 15 and 30 min., and the direct smokking was for 4 and 8 min.The smoked cheese was then divided into two parts for storage at room temperature and refrigerator, cheese samples were analysed chemically, bacteriologically, and organoleptically at 0, 15, 30 and 60days of storage.The results of this part indicated that the different smoke treatment prolonged the keeping quality of cheese to 30 days at room temperature and 60 days in refrigerator, while the control cheese wasspolied within the first 15 days.•The results also showed that the cheese of direct smoking was the lowest quality comparing with other treatments, besides to the contamination of smoked cheese by higher levels of benzo(a)pyrenecontent.•Smoking treatments retarded the cheese ripening during storage and the effect of smoking on cheese ripening was proportional to thesmoking time.Finally, it can be concluded that the investigator prepared smoke solution with very low concentration of benzo(a)pyrene compound. Also, it can be stated from this research that the smoking by using the smoke solution was more better than the traditional method, i. e., direct smoking since the resulting cheese was the lowest benzo(a)pyrene compound, with higher sensory evaluation. In addition it was found that the smoking process increase the keeping quality to 30 days at room temperature and 60 days with refrigeration, while the unsmoked cheese spoiled during thefirst 15 days.