

ICCN Poster Presentations

Food processing and human health

The effect of light and temperature on stability of vitamin A in the fortified vegetable oils (hydrogenated and nonhydrogenated)

B Farhang* and H Nikoopour

*Institute of Standard & Industrial research of Iran**

Institute of Nutrition and Food Industries Researches of Iran

One of the nutritional problems in developing countries is lack of some micronutrients, especially vitamin A, which causes 500000 children to die in developing countries annually. Besides, lack of vitamin A has led to skin diseases, xerophthalmia, anemia, etc in humans. One of the solutions to help solve this problem is the fortification of food products with vitamin A. This vitamin is fat-soluble, therefore in this research, sunflower liquid and hydrogenated blend oils were chosen as the carriers for vitamin A. During this study vitamin A-Palmitate (200IU/gr) was added to the samples and after packaging, the hydrogenated oils were stored at the ambient temperature (20-25 degree centigrade) or at 45. The liquid oil samples were stored at the above-mentioned temperatures both in darkness and exposed to light, for the period of 6 months. All fortified samples were examined bi-monthly for determination of stability of vitamin A and peroxide values, up to 6 months. Also all fortified samples were used for cooking (rice) and frying (potatoes) to determine the effects on these processes on stability of vitamin A. According to the results, the lowest stability of vitamin A was observed in liquid oil samples, which were exposed to light, and about 50 percent of vitamin A was lost after 6 months. On the other hand, the highest stability of vitamin A was observed within the hydrogenated oils, which were stored at the ambient temperatures, as about 95 percent of vitamin A was stable after 6 months. Cooking and frying processes caused vitamin A losses to 5 and 10 percent respectively. Also, the changes in peroxide values and stability of vitamin A were in opposite directions, i.e. by increasing of peroxide values in the fortified oil samples, vitamin A was decreased. These observations show the importance of original quality of oil for maintenance of stability of vitamin A. Considering the results obtained from this study, Fortification of the liquid and hydrogenated oils with vitamin A is recommended as a practical and efficient way of coping with vitamin A deficiencies in the diet. The fortified oils and fats must be packaged properly and stored away from light.

Cholesterol reduction of tallow by refining process and β -cyclodextrin treatment

I Gaeini*, H Zahiraghdam, P Zandi and F Madadnoei

School of Nutrition Sciences and Food Technology, Shaheed Beheshti University of Medical Sciences and Health Services, PO Box 19395/4741, Tehran/Iran

Lower consumption of saturated fat and cholesterol has been indicated to reduce serum cholesterol and risk of chronic diseases specially heart disease, hypertension, stroke and renal disease. Due to high contents of saturated fat and cholesterol in tallow, its consumption is limited. In this study we investigated the effects of the refining process and β -cyclodextrin (β -CD) treatment of tallow on the reduction of cholesterol and its other characteristics. Samples of tallow after rendering and filtration were subjected to refining process (neutralization, bleaching and deodorization). β -CD treatment was applied between bleaching and deodorization, according to the conditions reported by other researchers for lard (5% β -CD, 1:1 ratio of fat to water, stirring at 450 rpm at 30 C and centrifuging at 1000g for 15 min). After each process, acid value, peroxide value and cholesterol content were determined and the results were compared with the values before treatment. Fatty acid composition of tallow was also investigated before and after processing. It was found that, β -CD treatment alone can reduce cholesterol content to 81% whereas refining and β -CD treatment together reduce cholesterol content significantly by 90%, without any changes in the fatty acid composition ($p < 0.05$). It can be concluded that application of suitable technology will lead to products with better nutritional quality. Tallow processed in this way may be used directly or as a blend with other oils.