Biochemical studies of some natural additives effects on special foods

Fadl El-sayed Abdou El-Deeb

The prime goal of this study is to investigate and evaluate of some natural food additives on serum cholesterol concentration and lipid profile, also its effects on liver and kidneys functions of rats.The obtained results can be summarized as follows: 1- Chemical composition of raw materials:*Lipid content ranged from 2.53% for orange peel (albedo) to 3.42% for defatted chickpea flour.*Crude protein content showed in highest value for defatted soybean (36.74%), while the lowest one for orange peel (6.24%)*Crude fiber recorded the highest value in orange peel (albedo) 41.40%, while the lowest value recorded in defatted soybeanflour 9.39%.* Dietary fiber of dried powder of green mallow leaves gave the highest value 28.72%, while defatted soybean showed the lowestvalue 2.61%.Pectic substances content of different samples ranged from 3.28% for defatted soybean flour to 42.74% for orange peel(albedo).* Total carbohydrates of orange peel (albedo) gave the highest value (88.72%), while defatted soybean flour showed the lowestvalue (53.80%).* Protein digestibility has the highest value (81.22%) in dried powder of green mallow leaves, followed by orange peelJ*.105(albedo) (72.82%) then defatted soybean (63.24%) and whereas the lowest value was found in chickpea flour (58.16%).2- Physical and chemical properties of oils:Cottonseed, virgin olive and sunflower seed oils were subjected to the routine analysis of oils fats:-* Refractive index (at 25°C) of cottonseed oil was 1.456,sunflower seed oil 1.469 and virgin olive oil was 1.468.* The viscosity (at 20°C) has the highest value for virgin oliveoil 84.23, whereas the lowest value was found in sunflower seedoil 78.82.*Specific gravity of the three types of oil were as follows: Cottonseed oil has the highest value 0.925, while, sunflower seed oil was 0.921 and virgin olive oil was 0.914.*The acid value of the oils under investigation were low.*Saponification value (mg KOH/g oil) of cottonseed oil, sunflower oil and virgin olive oil were as follows: 193, 189 and 185, respectively.*Results showed that the peroxide value found in all samples were relatively small.The iodine value (Hanus) were 103.21 in cottonseed oil, 112.34 in sunflower oil and 82.65 in virgin olive oil.* The unsaponifiable matter content of cottonseed oil was 1.43%, sunflower oil 1.36% and virgin olive oil 1.24%.3-Fatty acid composition of oils:Results showed that the total saturated fatty acids in cottonseed oil was the highest, while total unsaturated fatty acids was the lowest. On the other hand, total saturated fatty acids in sunflower oil was the lowest, while, total unsaturated fatty acids was the highest one.4-Sterol and hydrocarbon composition of oils:The urisaponifiable matter of cottonseed oil consisted mainly of hydrocarbon (37.91%) and sterols (63.43%), sunflower oil (44.21%) and sterols (56.62%) and olive oil (59.18%) and sterols (40.71%), respectively.The results showed that the f3-sitosterol was the major sterol fraction of total sterols followed by campesterol and stigmasterol in cottonseed oil and sunflower oil.5-Biological evaluation of experimental diets:The obtained results showed that body weight gain was increased for rats fed dietary proteins, but rats fed dietary fibers reduced body weight gain, while feeding with dietary oils didn’t effect on body weight gain.Analysis of variance showed that variation in feed consumption due to different types of dietary was not significant.It is observed that rats fed dietary proteins had greater feed efficiency than those of the corresponding rats fed basal diet(control). However, rats fed dietary fibers or dietary oils decreased feed efficiency.The obtained results showed a decrease total lipids, triglycerides and phospholipids in rats fed on dietary protein and fibers, while, which feed on dietary oils an increased.Total serum cholesterol significantly decreased in rats fed on dietary proteins,

while rats fed on dietary fibers had the highest decrease values, but rats, which feed on sunflower oil reduce the total cholesterol content of serum. On the other hand, rats fed on olive oil lead to an increase low-density lipoproteins (LDL)cholesterol.High average value of total serum protein was found in rats fed on dried powder of green mallow leaves, while the lowest value was observed in rats fed on olive oil than those of fed on basal diet (control). On the other hand, serum albumin of rats fed on different experimental diets significantly decreased compared with control except rats fed on defatted chickpea flour was the highest one.6- Histopathological examination:The obtained results showed that no pathological changes in all examined oranges of rats in both control group and rats which fed on soybean flour. While, degeneration of hepatic cells was noticed in rats fed on chickpea flour, orange peel (albedo), sunflower oil and olive oil. Moreover, splenic hemosiderosis was found in rats fed on dietary oils (sunflower and olive oils).