ENZIMATIC ASSAY OF DIGESTIBILITY OF DIETARY FATS

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Digestion of vegetable oils is influenced by the composition of the oil, but also by the particular physiological factors specific to each individual. In order to determine the digestion effort, three types of oil and two types of animal fat were subjected to *in vitro* digestion research by modeling the digestion conditions at the level of the small intestine. Liver food supplements and pork and hen bile were used to initiate digestion. The digestion effort in the presence of pancreatic lipase (1050 FIP-U/g) increased in the order - pumpkin seed oil, sunflower oil, olive oil and, respectively, poultry fat, butter. The accumulation of free fatty acids was maximal for pumpkin oil (from 1.28 to 6.68%) and for chicken fat (from 0.67 to 4.23%) during the 4 hour of simulated digestion.

In the human diet fats play an important role as a source of biologically active compounds - fatty acids, vitamins, lecithin. The bio accessibility of these compounds depends considerably on the degree of digestibility of the primary fats. The essential physiological factors - the digestive enzyme (lipase) and the liver secret (bile) contributes significantly to the running of the digestion process. Sometimes, in the practice of dietitians, it is important to know the effort of digestion for nutrients, in order to be able to select and recommend a certain type of fat in the diet.

Oils and fats were purchased from the market. Food supplements used - Flaton (Bilim, Turkey), Choliver (D-G Pharma, Vietnam). Pig bile and chicken bile were extracted after slaughtering; they were sanitized, then dried. The samples intended for digestion consisted of oil/fat, lipase preparation and bile, which after homogenization and emulsification were maintained at 37 C for 0-4 h. Acidity index was determined by titration with KOH. The amount of free fatty acids was determined according to Xylem Brand Soft (2010).

The *in vitro* digestion effect of dietary fats was maximal in the presence of lipase (C = 6 mg/g) and minimal in the control sample. Thus, the increase of free fatty acids as an effort of digestion in the control sample, which did not contain lipase, for pumpkin oil was not significant (from 1.28 to 1.83%), in comparison with the sample with lipase (from 1.28 to 6.66%). Similarly, for hen fat, the amount of AGL in the control sample changed (from 0.67 to 1.23%) in the absence of lipase and (from 0.67 to 4.23%) in the presence of lipase. In the part of the experiment that referred to the use of vesicular bile for the better emulsification of dietary fats, results were obtained that suggest the statement that the origin of fats is as important as the essence of the physiological factor. Thus, in the presence of vesicular hen bile the amount of FFA increased from 0.67-1.72% for the hen fat (or 2.6 times) and only from the 1.05-1.76 (or 1.7 times) for the butter.

The index that corresponds to the accumulation of free fatty acids was selected as an estimation criterion for *in vitro* digestibility of fats. Pancreatic lipase from food supplements can significantly influence the process of digestion of dietary fats, contributing to a 3-4 times increase in the speed of dietary fat splitting into glycerol and free fatty acids. In the *in vitro* experiment with the addition of pig or poultry bile, the digestibility of poultry fat was higher in the presence of poultry bile. Respectively the pig's bile was more effective in splitting the butter.

Keywords: dietary fats, pancreatic lipase, vesicular bile, digestibility effort, free fatty acids (FFA)