IRON INTAKE BY RATS USING PERORAL ADMINISTRATION OF $^{55}$Fe-SALTS OF PHOSPHATIDIC ACIDS

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The utilization of $^{55}$Fe and its incorporation into rat organs was investigated after peroral administration of various salts of phosphatidic acids /PA/. Iron of PA salts is utilized among 58-94% comparing to $^{55}$Fe$^{2+}$. The degree of iron utilization depends on the type of PA salts administrated.

INTRODUCTION

Synthetic salts of phosphatidic acids are used in food industry instead of natural lecithins$^1,2$. The salts mainly used are the ammonium ones which metabolic fate have been already studied$^3,4$. The results have shown that they are fully metabolized in the gastrointestinal tract and do not affect the common turnover of phospholipids$^3,4$. Later on, calcium salts were successfully introduced into food technology$^5$. However, a lot of
other cations may form the salts of phosphatidic acid, e.g. \( \text{Mg}^{2+}, \text{Mn}^{2+}, \text{Co}^{2+}, \text{Zn}^{2+}, \text{Cu}^{2+}, \text{Fe}^{2+} \) and \( \text{Fe}^{3+} \). Due to the possible application of Fe-salts of phosphatidic acids /Fe-PA/ for iron supplementation in human nutrition attention was paid to the iron utilization in the organisms of experimental rats. The results obtained may be compared with other studies concerning with iron absorption\(^6\text{-}^8\) and the iron accessibility from various compounds\(^9\text{-}^{14}\).

MATERIALS AND METHODS

Synthetic phosphatidic acids were supplied by Milo, Olomouc, Czechoslovakia. They were derived either from the saturated fats /designation LM/ or from the unsaturated ones /designation RM/. \(^{55}\text{FeCl}_3 /\text{R-Fe-3}, 370 \text{ MBq/ and } ^{45}\text{CaCl}_2 /\text{R-Ca-3}, 370 \text{ MBq/ were from the Institute of Nuclear Research, Swierck, Poland. Liquid scintillator Aquasol and tissue solubilizer Protosol were purchased from NEN Chemicals, Boston, USA. White, male rats weighing about 170 g were supplied from the Experimental Animal Farm at Lysolaje near Prague, Czechoslovakia. All other chemicals used were from Lachema, Brno, Czechoslovakia.}

Methods

Iron content in all samples was determined spectrophotometrically with 4,7-diphenyl-1,10-phenanthroline-3,6-disulphonic acid\(^{15}\).

Preparation of \(^{55}\text{Fe-salts of phosphatidic acid } /^{55}\text{Fe-PA/}

\( \text{FeSO}_4 /125 \text{ mg } \text{Fe}^{2+} \) containing 185 MBq of \(^{55}\text{Fe/ dis-}
\text{solved in 5 ml of distilled water was precipitated with} \))