

X. Intestines

Digestion and Absorption of Medium Chain Triglyceride (MCT), in Vivo and in Vitro, in Comparison with Long Chain Triglyceride (LCT)

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Recently medium chain triglyceride has been used for the treatment of fat malabsorption syndromes, as it has been widely thought that MCT is more easily hydrolyzed and absorbed than LCT.

Test meals containing trioctanoin-1-¹⁴C or tripalmitin-1-¹⁴C were administered into the duodenum of the male albino rats weighing 120–150g. Lipids of intestinal contents, intestinal wall and portal blood were extracted, assayed radioactivity and then analyzed by thin-layer chromatography and autoradiography thereof. In the other series of experiment in vitro, trioctanoin-1-¹⁴C or tripalmitin-1-¹⁴C were incubated with albumin solution (phosphate buffer, pH 7.4), varying taurocholic acid concentration, varying steapsin concentration, at 37.0°C and analyzed with florisil column chromatography. On the further experiments, steapsin was replaced by the rat pancreatic juice or the rat intestinal mucosal

homogenates.

MCT is mostly hydrolyzed by pancreatic lipase with the aid of bile acid in the intestinal lumen, and a small amount of intact MCT and its lower glycerides, which are not hydrolyzed in the intestinal lumen, are hydrolyzed completely by intestinal lipase in mucosa.

Most of released FA from MCT enter the portal vein. It is thought that a little of intact MCT enter the intestinal mucosa, but it cannot enter the portal vein. Taurocholic acid and steapsin show lipolytic activity to MCT as equal as to LCT. Rat intestinal mucosal homogenate (intestinal lipase) has low lipolytic activity to triglyceride.

The mechanism, by which MCT is more easily and rapidly absorbed than LCT, is that the released FA from MCT is transported via portal flow, which is more rapid than lymphatic flow.

Reesterification of Medium Chain Triglycerides in Mucosal Cells during Their Intestinal Absorption

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The absorption and subsequent intracellular reesterification of medium chain fatty acids have received less extensive attention, espe-

cially incorporation of MCT to LCT.

The present investigation was undertaken to define more clearly the mechanism of