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Hormone-Receptor Interaction as a Guide to Biochemical Mechanism

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COMMUNICATIONS

Effect of Bile and Pancreatic Juice on the Absorption of Long-Chain Fatty Acids in the Sheep

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In further investigations of the role of pancreatic juice in the digestion and absorption of fat in the ruminant we have studied the absorption into the lymphatic circulation of radioactively labelled stearic acid, palmitic acid and oleic acid. Sheep were suitably prepared with a thoracic-duct fistula and with an intestinal cannula which allowed diversion of the mixed secretions of bile and pancreatic juice. When bile and pancreatic juice flowed normally into the intestine the recovery in the lymph of stearic acid, palmitic acid and oleic acid was 54, 69 and 83% respectively of the radioactivity introduced into the duodenum; 85-95% of the radioactivity was located in the triglycerides. As in non-ruminants, therefore, the absorption of long-chain fatty acids increases in the order stearic acid < palmitic acid < oleic acid (Deuel, 1954).

When the mixed secretions of bile and pancreatic juice were diverted from the intestine, and bile alone infused, the absorption of stearic acid, palmitic acid and oleic acid fell to 0.8, 4.2 and 24.2% respectively of the dose infused. When pancreatic juice alone was infused, with diversion of mixed secretions, less than 1% of the dose was recovered in the thoracic-duct lymph. These results vindicate the conclusions of Heath & Morris (1964) that both bile and pancreatic juice are required for optimum fat absorption in the sheep.

Other experiments involving incubation of

intestinal segments *in vitro* and observations on intestinal loops *in vivo* have shown that, in the absence of pancreatic juice, fatty acids in a micellar form with bile enter the mucosal cell and are re-synthesized rapidly into triglycerides. It appears likely, therefore, that pancreatic juice functions at the luminal stage of digestion, probably by releasing fatty acids from food particles and allowing their solubilization in bile salts; the lysolecithin formed from bile by pancreatic juice may be partly or completely responsible for this action (Leat & Harrison, 1969).

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Base Exchange Reactions of Phospholipid Metabolism in Chick Brain Microsomal Membranes

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The incorporation of nitrogenous bases into phospholipid follows at least two distinct patterns in animal tissue. The first involves the classical Kennedy's pathway and depends on cytidine nucleotides and Mg^{2+} . Its operational existence in nervous tissue has been adequately demonstrated (see Porcellati, Biasion & Pirotta, 1970). The