et al., 1963), which may explain its slower effect on fatty acid and ketone body concentrations. Galactose is only slowly converted into glucose by the perfused liver (Ross, Hems & Krebs, 1967), and in this investigation galactose re-feeding produced no change in blood glucose. The eventual fall of ketone body and fatty acid concentrations may be explained by galactose inhibition of fatty acid release from adipose tissue (see Buckle, Rubinstein, McGarry & Beck, 1961).

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Pathways of Lipid Synthesis in the Sheep Intestine

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In monogastric animals dietary triglycerides are hydrolysed in the lumen of the small intestine to monoglycerides and free fatty acids, which are then absorbed into the mucosal cell. Re-synthesis of triglyceride occurs by two pathways, the monoglyceride pathway accounting for 75%, and the α -glycerophosphate pathway for 25%, of resynthesized triglyceride (Mattson & Volpenhein, 1964). In the ruminant animal, because of lipolysis by rumen micro-organisms, most of the dietary fat reaches the small intestine in the form of free fatty acids (Garton, 1960) and only negligible amounts of monoglyceride are detected in the intestinal contents of the sheep (Leat & Harrison, 1967). It was therefore of interest to determine if the monoglyceride pathway was functional in the ruminant intestine.

Segments (200 mg. wet wt.) of the small intestine of lambs and sheep were incubated *in vitro* basically according to Kern & Borgstrom (1966) and the synthesis of lipids from various combinations of the following substrates was determined: [9,10-³H]-palmitic acid, [1-¹⁴C]oleic acid, [1-¹⁴C]glycerol and [1-¹⁴C]glycerol-labelled [³H]monopalmitin. Similar studies were made *in vivo* in anaesthetized sheep by using isolated intestinal loops. Lipid extracts of the intestinal tissue were subjected to thin-layer

chromatography to determine the nature and extent of lipid synthesis.

It was found that the ¹⁴C-labelled glycerol from both the 1- and the 2-[³H]monopalmitate was incorporated into triglycerides by the intestine of the sheep with little quantitative difference between the foetus, lamb and adult. The triglyceride synthesized via the monoglyceride pathway at times exceeded 50% of the total glyceride synthesis, whereas the incorporation of free glycerol on an equimolar basis was on average less than 10% of that of monoglyceride glycerol. The 2-monopalmitate was incorporated into triglycerides to a greater extent than was the 1-monopalmitate, partly because there was less hydrolysis of the 2-isomer. In homogenates of sheep intestine, however, monoglycerides have been reported to be ineffective as precursors of triglyceride (Bickerstaffe & Annison, 1968).

The incorporation *in vivo* of 1- and 2-monopalmitate into triglyceride in the intestinal mucosa in intestinal loops was similar to that observed *in vitro* with intestinal segments, with little difference found between sheep and rats.

It may be concluded that, although under normal conditions the contents of the small intestine of the sheep contain negligible amounts of monoglyceride, the intestinal wall still maintains the ability to absorb monoglycerides intact and incorporate them directly into triglycerides.

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Some Effects of α -Bromopalmitate, an Inhibitor of Fatty Acid Oxidation, on Carbohydrate Metabolism in the Rat

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There is evidence that the depression of carbohydrate utilization by muscle and the stimulation of gluconeogenesis by the liver observed in conditions of high lipid mobilization are caused by products of fatty acid oxidation (Randle, Newsholme & Garland, 1964; Williamson, 1967). The effects of α -bromopalmitate, an inhibitor of fatty acid oxidation, on some aspects of carbohydrate metabolism have therefore been studied.

α -Bromopalmitate (0.25 mM) inhibited the oxidation of [1-¹⁴C]palmitate by rat heart homogenates