lated that these activities are mediated by a single enzyme.

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The Uptake of Glycerol Ethers by the Lactating Goat Mammary Gland

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The mammary uptake of blood triglycerides, in the form of chylomicrons and low-density lipoproteins, accounts for 50–60% of milk-fat triglyceride in the goat (Linzell, 1968), but it is not known if the fat is taken up as intact triglyceride, partial glycerides or free fatty acids. Data relevant to this problem include the known mammary uptake of plasma free fatty acids (Annison, Linzell, Fazakerley & Nichols, 1967), the release of lipoprotein lipase by the mammary gland (Barry, Bartley, Linzell & Robinson, 1963) and the change in the $^{14}\text{C}/^3\text{H}$ ratio that occurs during the transfer of doubly labelled chylomicron triglyceride into milk fat (West, Annison & Linzell, 1967). The reutilization for mammary fat synthesis of the products of triglyceride hydrolysis vitiated quantitative interpretation of the latter data, and largely prevents the direct study of the uptake of partial glycerides. The use of glycerol ethers, however, which function as analogues of mono- and diglycerides in their acceptance of activated fatty acids (Gallo, Vahouny & Treadwell, 1968), provides unequivocal data on uptake since the ether linkage is not susceptible to lipase action in mammary tissue.

Stabilized emulsions of trilinoleoyl glycerol ether, 2-linoleoyl 1-oleoyl glycerol ether, 1-oleoyl glycerol ether, 2-oleoyl glycerol ether or ^{14}C -labelled glycerol monoethers (particle size 0.5–3.0 μm) were infused into the arteries of lactating goats over 90–120 min. The goats were milked at 1 h intervals for 5 h, then anaesthetized, and samples of mammary tissue were removed for analysis.

The glycerol triether was not taken up, and only traces of the glycerol diether and the glycerol 1-monoether could be detected in mammary tissue. In contrast, 10–20% of infused 2[^{14}C]-linoleoyl

glycerol ether was extracted by the udder, and about 20% of the ether taken up appeared in milk as 'triglyceride'. The specificity of the mammary gland for glycerol 2-monoethers was checked further by infusing a mixture of 2-oleoyl glycerol ether and 1-oleoyl glycerol ether: only the glycerol 2-monoether appeared in mammary tissue and milk.

The results support the view that the 2-mono-glyceride pathway of triglyceride synthesis is operative in goat mammary tissue (Dimick, McCarthy & Patton, 1966), in addition to the glycerol 3-phosphate pathway (Pynadath & Kumar, 1964), and are in line with the failure of 1-monoglycerides to act as precursors of triglyceride (Pynadath & Kumar, 1964). Further, the findings suggest that the hydrolysis of blood triglyceride to 2-monoglyceride and free fatty acids in the capillaries of the mammary gland is a prerequisite of uptake.

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Toxicity of Methylxanthines and Local Anaesthetics towards Muscle

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Although the methylxanthines are often added to tissue preparations to act as inhibitors of phosphodiesterase and hence of the breakdown of 3':5'-cyclic AMP, they are at the concentrations generally used (1–5 mM) very toxic to muscle. The tissue goes into rigor, suffers deterioration of condition and exhibits a diminished rate of incorporation of amino acids into protein. The capacity to induce contraction and rigor has been known for some years (Axelsson & Thesleff, 1958), though the mechanism is not fully understood. That the drugs may release Ca^{2+} from the sarcoplasmic reticulum has been considered (Bianchi, 1961; Weber & Hertz, 1968), and if so we may expect to see other effects on metabolism. In this we are not disappointed. Either compound at 5 mM enhances respiration of isolated diaphragm muscle by about 40%, and by about 20% when added at 1 mM. Again the mechanism of this stimulation is not clear. There