bile salts (pancreatic lipase characteristics) and being inhibited by protamine and pyrophosphate (lipoprotein lipase characteristics). 1M-NaCl either activated, inhibited or had no effect, depending on the conditions of assay. By the use of specific inhibitors for one or other enzyme, the differing optimum pH values for each of the two types of lipolytic activity were demonstrable. From these observations it might be assumed that both preparations consisted of a mixture of two separate enzymes. However, incubation with NaF and protamine in combination did not result, as would be expected in this case, in complete inhibition, but merely in the degree of inhibition equal to that caused by protamine alone. Similarly, in the presence of Ca^{2+} and albumin, where 1M-NaCl gave 40% inhibition (characteristic of lipoprotein lipase) and fluoride 65% inhibition (characteristic of pancreatic lipase), the inhibition in the combined presence of NaF and 1M-NaCl was only 69%. These observations suggest that the two types of lipolytic activity are mediated by a single enzyme.

Further evidence for this was obtained by using Sephadex chromatography. Each pancreatic preparation gave a single chromatographic peak with a molecular weight of 800 000 when run through Sephadex G-200, but after acetone treatment a delipidized product in each case gave a second peak of much smaller molecular weight (15 000–20 000). This molecule also demonstrated the mixed lipolytic activities associated with the parent molecule.

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Fat-Body Lipogenesis during Development of the Adult Male Desert Locust

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Changes in fat-body lipogenesis measured by acetate incorporation into lipid and changes in associated enzymes have been followed during development of the adult male desert locust (*Schistocerca gregaria*). Lipid accumulates in the fat-body during the first 8 days after emergence, the major period of accumulation occurring between the sixth and the eighth day. There is a rapid increase in $[\text{U-}^{14}\text{C}]$ acetate incorporation into lipid between the fifth and seventh day after a period of intensive feeding between emergence and 5 days. Similar results were obtained for $[\text{U-}^{14}\text{C}]$ glucose, $[\text{U-}^{14}\text{C}]$ trehalose and $[1,5\text{-}^{14}\text{C}_2]$ citrate incorporation into lipid. The incorporation of $[1,5\text{-}^{14}\text{C}_2]$ citrate into lipid implies the functioning of the citrate-

cleavage pathway in the conversion of carbohydate into lipid.

'Malic' enzyme, which is considered to be important in the production of NADPH for lipogenesis in mammalian tissues (Kornacker & Ball, 1965), increases in activity between emergence and 4 days, exhibiting a pronounced peak at 4 days. This pattern is similar to those of phosphofructokinase and pyruvate kinase, which both increase in activity after emergence, and phosphofructokinase in particular has a pronounced peak of activity at 4 days. Isocitrate dehydrogenase (NADP-dependent) and glucose 6-phosphate dehydrogenase, which may also be important in the production of NADPH for lipogenesis, increase in activity between emergence and 2 days, the increased activity being maintained until after 8 days. ATP citrate lyase is the key enzyme in the citrate-cleavage pathway. The activity of this enzyme is constant between emergence and 4 days and then increases to give a peak of activity between the sixth and the eighth day. The developmental pattern for this enzyme is very similar to the pattern of acetate incorporation into lipid.

The scheme of Kornacker & Ball (1965) involving coupling of ATP citrate lyase and 'malic' enzyme requires parallel changes in activity of these enzymes during changes in lipogenesis. Since there is no correlation between the changes in activity of ATP citrate lyase and 'malic' enzyme during development it is unlikely that this pathway operates in the locust. 'Malic' enzyme may function to produce malate from pyruvate during increased glycolysis. Intramitochondrial oxaloacetate derived from the malate could be used to condense with acetyl-CoA to provide citrate for lipogenesis. NADPH for lipogenesis may be provided by glucose 6-phosphate dehydrogenase and isocitrate dehydrogenase.

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Rat Liver β -Xylosidase, a Lysosomal Membrane Enzyme

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β -Xylosidase activity, as determined with *o*-nitrophenyl and *p*-nitrophenyl β -D-xylopyranosides, is widely distributed in animal tissues

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