to that observed (Okuda & Fujii, 1967, 1968) with rat adipose-tissue and liver lipase activity after acetone treatment.

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The Influences of β -Casein Removal on Bovine Casein Micelles

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Over 50% of the β -casein is dissociated from casein micelles (relative α_s -, β - and κ -casein composition 5.6, 3.4 and 1.0 respectively) together with less than 5% of the α_s - and 20% of the κ -casein by gel filtration (Downey & Murphy, 1970) of skim milk at 4°C. Approx. 80% of the casein removed from the micelles and eluted with the whey proteins is β -casein. The average relative composition of the resultant micelles that are eluted at the void volume is 6.4, 2.8 and 0.8 parts of α_s -, β - and κ -casein respectively, and their stability towards Ca^{2+} and susceptibility to rennin proteolysis are similar to those reported (McGann & Pyne, 1960; Fox, 1969) for milk. On a second gel filtration of these micelles a further 30% of the β -, 10% of the κ - and 5% of the α_s -casein is dissociated and the resultant micelles (6.8, 2.2 and 1.0 parts of α_s -, β - and κ -casein respectively) are precipitated by 50mmol per litre of calcium chloride (1h at 37°C). Approx. 10% of the β -casein of these micelles, but very little α_s - or κ -casein, is removed by a third gel filtration, and the micelles (7.5, 1.7 and 0.8 parts of α_s -, β - and κ -casein respectively) are eluted at the void volume and are unstable to 10mmol per litre of calcium chloride (1h at 37°C). On subsequent gel filtration little or no free casein is detected, and the casein micelles eluted as an opaque peak at the void volume (mol.wt. $> 10^8$) attain a final relative composition of 8.0, 1.2 and 0.8 parts of α_s -, β - and κ -casein and are immediately precipitated on addition of 10mmol per litre of calcium chloride at 37°C.

This investigation suggests that hydrophobic interactions are involved in maintaining most (approx. 80%) of the β -casein within the hydrophobic core (Hill & Wake, 1969) of casein micelles. As the temperature is decreased hydrophobic bonds are weakened (Mahler & Cordes, 1967), and this β -casein accordingly dissociates and is released

through the structural lattice (Ribadeau-Dumas & Garnier, 1970) of the casein micelles. As indicated by restricted passage through the pores of Sephadex G-200, the free β -casein exhibits an apparent molecular weight of 200 000, and, since at least 50% of the β -casein is removed without micellar disintegration or affecting stability towards Ca^{2+} , it is suggested either that the β -casein aggregates subsequent to its removal or that some of the pores of casein micelles are sufficiently large to permit diffusion of proteins of this effective molecular size. The decreased stability towards Ca^{2+} after the removal of additional β -casein may have resulted from the concomitant dissociation of κ -casein. The residual β -casein (approx. 20%) appears to be more strongly bound.

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Possible Role of Cytidine Diphosphate Choline in the Complexing of Carbohydrate to β -Lipoprotein in Liver

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Choline derivatives stimulate the synthesis of both the peptide and the carbohydrate moieties of soluble proteins released by rat liver (Mookerjea, 1971; Mookerjea & Marai, 1971). Since [$1\text{-}^{14}\text{C}$]glucosamine is incorporated into low-density lipoproteins (Mookerjea, Jeng & Black, 1967), it was decided to investigate the effect of choline derivatives on the complexing of carbohydrate to this protein fraction and the possible role that the carbohydrate may play in regulating secretion of the macromolecules.

The complexing of carbohydrate to β -lipoprotein was followed by measuring the incorporation of [$1\text{-}^{14}\text{C}$]glucosamine and UDP-*N*-acetyl[$1\text{-}^{14}\text{C}$]glucosamine with rat liver slices and subcellular particles. After dialysis of the incubation media, the β -lipoprotein was precipitated by the Ca^{2+} -heparin method of Jordan, Faulkner & Knoblock (1966). Immunoelectrophoresis of the medium β -lipoprotein showed identity with that