the problem, and ultimately on world trade.

J.B. ROSSELL
J. RUSSELL
J.E. CHIDLEY
Loders Cocos Butters
Cairn Mills
London, England

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# Glyceride Composition by Lipolysis

*Sir:* A recent article in the Journal (A. Sungupta and S.P. Basu, 55:533 1978) prompts me to draw the attention of your readers to a common error in the interpretation of results obtained by lipolysis of glycerides using pancreatic lipase.

By careful experimentation it is possible to determine the component acids present in natural mixture of triglycerides and in the 2-monoacylglycerols derived from them by lipolysis. By simple calculation these provide the composition of fatty acids in the 2-position and in the combined 1- and 3-positions, but how can they yield further information about glyceride composition? The method suggested independently by Vander Wal (1) and by Coleman (2) is generally employed. This involves two assumptions: (a.) that the fatty acids attached to the 1- and 3-positions are the same, and (b.) that the fatty acids occupying the 1-, 2-, and 3-positions are associated with each other in a random manner. These assumptions may or may not be valid for natural glyceride mixtures but *the second cannot be true for natural glyceride mixtures which have been segregated into fractions on the basis of some physical property.*

The many seed oils with saturated (S), oleic (O), and linoleic (L) acids, for example, could contain SSS, SSO, SOO, SSL, OOO, SOL, OOL, SLL, OLL, and LLL triacylglycerols where these symbols indicate merely the acyl groups present and not their position. Silver ion chromatography produces bands in this order with SSS having the highest $R_f$ and LLL the lowest (3). Whilst it is difficult to get complete separation leading to glycerides of a single type, it is to be expected that there will be useful concentration of each glyceride category, and separated fractions will no longer contain all the triglycerides present in the original mixture. The Vander Wal-Coleman assumptions are then no longer valid.

Low temperature crystallization is based on the solubility of glycerides and indirectly on their degree of unsaturation. Even though we know less about the relative solubility of the different glyceride categories, it is still true that glycerides of a particular kind are concentrated in each fraction, that each fraction is more homogeneous (less random) than the original mixture, and that the Vander Wal-Coleman procedure cannot be validly applied to the segregated fractions.

The results of Sengupta and Basu are complicated by the wide range of saturated acids ($C_{14}$-$C_{24}$). Consider, however, fraction B (11.8% mol) which contain 14:0 (5.4%), 16.0 (19.6%), 18.0 (2.9%), 22:0 (1.2%). 18:1 (32.7%), 18:2 (35.3%), and 18:3 (2.9%) and has the highest iodine value of all fractions. This fraction is likely to concentrate the $SU_2$ glycerides along with $U_3$ glycerides and to contain less of the $S_2U$ and $S_3$ glycerides which will predominate in the less soluble fractions of lower iondine value. Since crystallization should produce fractions of increased homogeneity, this fraction probably contains SOL as its major conponent rather than mixtures of SOO and SLL or of $S_2U$ and $U_3$, each of which should have been separable. The calculations of Sengupta and Basu, using the Vander Wal-Coleman procedure, indicate the presence of SSS (1.2%), SSO and SSL (18.1%), SOO, SOL, and SLL (47.1%), and OOO, OOL, OLL, and LLL (33.6%). It seems likely that the content of $S_3$, $S_2U$, and $U_3$ glycerides will be lower than this and that of $SU_2$ will be correspondingly higher.

I hope, sir, that your authors and referees will be alerted to this error and that we shall see less of it in the future.

F.D. GUNSTONE,
Chemistry Department,
University of St. Andrews,
St. Andrews,
Scotland

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