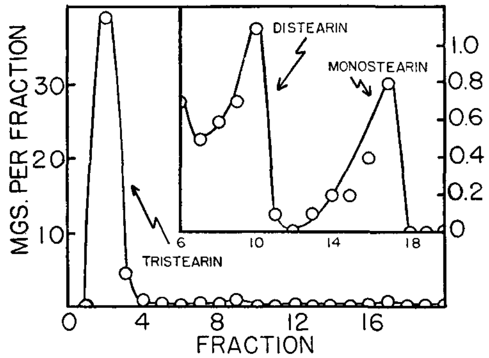

FIG. 4. Chromatogram of a commercially pure Tristearin sample. The eluting solvents were similar to solutions B, C, and D of Figure 1.

A summary of the analytical results are shown in Table I. The recovery appears to be quite satisfactory.

The synthetic mixtures used in this study were analyzed by a chemical method (10). The results of these analyses are shown in Table II. This gives a comparison of the accuracy of the two methods.

The above procedure was applied to two known mixtures of mono-, di-, and tristearin to test the reliability of the method. The results obtained are shown in Table III.

TABLE I

Recovery of Components of Glyceride Mixtures

Sample	Glyceride added	Mineral oil added	Mineral oil recovered	Recovered			Total
				mono-	di-	tri-	
	mg.	*mg.*	*mg.*	*mg.*	*mg.*	*mg.*	
1	150.0	51.9	51.4	24.5	80.0	43.6	199.5
2	100.0	50.3	49.7	35.7	50.5	12.6	148.5
3	100.2	50.0	49.8	15.9	53.1	31.2	150.0
Tristearin	50.5	......	......	1.5	3.1	45.7	50.3

TABLE II

Comparison of Chemical and Chromatographic Method of Analysis

Sample	Tristearin		Distearin		Monostearin	
	Chem.	Chrom.	Chem.	Chrom.	Chem.	Chrom.
	percentage		*percentage*		*percentage*	
1	29.00	29.07	55.80	53.50	15.20	16.20
2	11.10	12.60	51.20	50.50	37.70	35.70
3	......	31.14	......	52.99	15.80	15.87

TABLE III

Recovery of Components of Known Mixtures of Glyceryl Stearins

Mixture	Glyceride added	Mono-		Di-		Tri-		Total
		added	recov.	added	recov.	added	recov.	
	mg.	*mg.*	*mg.*	*mg.*	*mg.*	*mg.*	*mg.*	*mg.*
1	100.2	40.1	39.7	20.0	20.1	40.1	40.2	100.0
2	100.1	20.1	19.7	50.1	49.8	30.0	30.4	99.9

The precision and accuracy of the chromatographic method seems to be quite satisfactory for most purposes.

Summary

A procedure for the quantitative separation and determination of mono-, di-, and tristearin by elution chromatography is presented. The individual components are found to be absorbed on silica gel in the following order: mono-, di-, and triglycerides. By using a solvent system of suitable polarity, it is possible completely to separate individual components of a mixture from one another. Satisfactory separation of the stearin mixture is obtained by using 100% isopropyl ether, followed by a solution of 70% ethyl ether in isooctane. This latter solvent system is then followed by a solution of 20% ethanol in isopropyl ether. This chromatographic method compares favorably with the chemical method of analysis of glyceride mixtures.

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REFERENCES

1. Jacobs, M. B., "The Chemical Analysis of Foods and Food Products," 2nd ed., p. 380, D. Van Nostrand Company Inc. (1951).
2. Handschumaker, E., and Linteris, L., J. Am. Oil Chemists' Soc., *24*, 143 (1947).
3. Pohle, W. D., Mehlenbacher, V. C., and Cook, J. H., J. Am. Oil Chemists' Soc., *22*, 115 (1945).
4. Borgström, B., Acta Physiol. Scand., *30*, 231 (1954).
5. Hamilton, J. G., and Holman, R. T., J. Am. Chem. Soc., *76*, 4107 (1954).
6. Dieckert, J. W., and Reiser, Raymond, J. Am. Oil Chemists' Soc., *33*, 123 (1956).
7. Reinhold, C. L., and Dutton, H. J., J. Am. Oil Chemists' Soc., *25*, 117 (1948).
8. Tischer, J., and Tögel, E., Z. Physiol. Chem., *282*, 103 (1947).
9. Kaufmann, H. P., and Wolf, W., Fette u. Seifen, *50*, 519 (1943).
10. Troy, A., and Bell, A. G., Proc. Sc. Sec. Toilet Goods Assoc., *5*, 10 (1946).

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THE FOLLOWING TABLE gives the averages of the lint yield analyses obtained from three sets of samples sent out during the past year. All three samples were second-cut linters. No hull-fiber samples were sent out as very little of this material is sold at the present time.

Lab. No.	No. of tests	A Linter	B Linter	C Linter	Over-all average for the year
1	3	79.3	73.3	69.2	73.9
2	3	79.3	73.1	69.2	73.9
3	3	79.4	73.9	69.7	74.3
4	3	79.6	73.0	69.1	73.9
5	3	79.1	73.5	69.7	74.1
6	3	79.7	73.3	69.5	74.2
7	3	79.4	73.4	69.2	74.0
9	3	79.3	73.2	69.4	74.0
10	3	80.6	74.4	70.4	75.1
Average	....	79.5	73.5	69.5	74.2

As seen by the above results, very good checks were obtained showing that the laboratories are keeping their equipment in good shape. There were a few instances in which the laboratory would be off a little in one set but would get in line as soon as the check analyses were returned.

We believe that it is still a good idea to keep checking laboratories at least three times a year to keep all equipment in good shape. Therefore it is recommended that samples be sent out at least three times during the coming year to check on laboratories equipped to run cellulose yield analyses.

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