TABLE I

Fatty Acid Composition of Whole Triglyceride and of Fatty Acids in 2-Position of Triglyceride and Proportion [a] of Each Fatty Acid in 2-Position

	Iodine value	*Trans* acids	Weight %				
			Palmitic	Stearic	Oleic	Linoleic	Linolenic
		%					
Sample 1, rearranged SBO							
Triglyceride	127.6	0	11.1	4.3	29.1	48.9	6.0
2-Position	.....	0	11.0	4.5	29.5	48.2	5.3
Proportion	.....	....	33.3	34.8	33.8	32.9	29.5
Sample 2, hardened SBO							
Triglyceride	116.2	6	11.2	4.7	38.8	41.4	3.4
2-Position	.....	7	10.8	4.4	37.5	42.8	3.7
Proportion	.....	39	32.2	31.1	32.2	34.5	36.0
Sample 3, hardened SBO							
Triglyceride	106.2	13	11.8	4.9	48.4	32.8	1.5
2-Position	.....	10	11.3	4.7	50.2	31.9	1.5
Proportion	.....	26	32.0	32.0	34.6	32.4	33.0
Sample 4, hardened SBO							
Triglyceride	95.3	20	11.4	5.0	61.2	21.8	0.4
2-Position	.....	20	10.8	4.8	58.7	24.5	0
Proportion	.....	33	31.6	32.0	32.0	37.5	....
Sample 5, hardened SBO							
Triglyceride	85.0	26	12.0	5.8	69.5	11.0	0
2-Position	.....	25	10.6	5.3	69.1	13.8	0
Proportion	.....	32	29.5	30.5	33.1	41.8	....
Sample 6. original SBO							
Triglyceride	.....	0	11.3	4.3	29.1	49.5	5.8
2-Position	.....	....	1.0	0.7	26.1	66.7	5.5
Proportion	.....	....	3.0	5.5	30.0	45.0	31.6

[a] 2-Position/(Triglyceride × 3) × 100 = Proportion, i.e., the percentage of that particular fatty acid that is in the 2-position.

positions of the triglycerides (Sample 1). Linolenic acid may appear to be an exception; however, considering the errors in the lipase method and the analytical methods the value of 29.5% cannot be considered as significantly different from the theoretical value of 33.3%.

The proportion values for each of the unsaturated acids remained at approximately 33% in the various hydrogenated fats. Thus the rates of hydrogenation of oleic, linoleic, and linolenic acids are not influenced by the position these fatty acids occupied on a triglyceride molecule. An exception to this is suggested by the values for linoleic acid in Sample 5. However, since all the other values, both for linoleic and the other acids, do not show any pattern digressing from randomness, this single deviation is considered to be experimental error.

Figure 1 is a graphic presentation of the fatty acid composition of the triglycerides of the randomly rearranged soybean oil and the hydrogenated fats prepared from it. These values are typical of those that have been reported for non-randomized soybean oil hydrogenated under these conditions (7). The similarity of the products of hydrogenation of randomized and non-randomized soybean oil further confirms that the position a fatty acid occupies on a triglyceride molecule does not influence its hydrogenation under these conditions.

REFERENCES

1. Mattson, F. H., and E. S. Lutton, J. Biol. Chem., *233*, 868 (1958).
2. Savary, P., J. Flanzy, and P. Desnuelle, Biochim. et Biophys. Acta, *24* 414 (1957).
3. Bushell, W. J., and T. P. Hilditch, J. Chem. Soc., 1767 (1937).
4. Mattson, F. H., and R. A. Volpenhein, J. Lipid Res., *2*, 58 (1961).
5. Mattson, F. H., and L. W. Beck, J. Biol. Chem., *219*, 735 (1956).
6. "American Oil Chemists' Society Official and Tentative Methods," 2nd ed., rev., 1958.
7. Bailey, A. E., "Industrial Oil and Fat Products," 2nd ed., pp. 694 and 696, Interscience Publishers, Inc., New York, 1951.

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• *Letter to the Editor*

Vinyl Ketones in Oxidized Fats

CROSSLEY, HEYES, AND HUDSON have reported the effect of heat on tricaprin and 2-oleo-dipalmitin both in the absence and in the presence of oxygen (1). Eighteen carbonyl compounds were isolated from 2-oleo-dipalmitin heated at 190C. in the presence of air. The two major components were unsaturated ketones and though not positively identified, were very closely related to n-heptylidene acetone and n-hexylidene acetone. After a discussion of degradative mechanisms Crossley et al. have suggested that the compounds might be vinyl n-heptyl and vinyl n-hexyl ketones.

We have recently identified a compound responsible for metallic flavor in oxidized dairy products and oxidized safflower oil as vinyl n-amyl ketone (oct-1-en-3-one) (2). This compound has a flavor threshold value of one part in 10^9 in butterfat and one part in 10^{10} in water. We have also studied the C_{4-9} vinyl n-alkyl ketones and found their flavors to be closely similar (3). Papers on their gas chromatographic behavior (4) and on the paper chromatography of their 2,4-dinitrophenylhydrazones (5) are being prepared for publication.

The gas chromatographic data for the two unknown compounds reported by Crossley et al. do not correspond to the behavior we have observed for the C_{4-9} vinyl ketones, nor apparently do the light absorption or R_f values for the 2,4-dinitrophenylhydrazones. The two unsaturated ketones reported by Crossley et al. may be alk-3-en-2-ones or di-unsaturated ketones such as alka-3,7-dien-2-ones whose properties will resemble closely the mono-unsaturated conjugated ketones. Neither type of compound has yet been isolated from fats or oils and the identification of either would be of considerable importance.

D. A. FORSS,
E. H. RAMSHAW, AND W. STARK,
Dairy Research Section,
C.S.I.R.O., Melbourne,
Australia.

REFERENCES

1. Crossley, A., T. D. Heyes, and B. J. F. Hudson, JAOCS, *39*, 9 (1962).
2. Stark, W., and D. A. Forss, J. Dairy Res., *29*, 173 (1962).
3. Ramshaw, E. H., J. Food Sci., to be submitted.
4. Ramshaw, E. H., J. Chromat., to be submitted.
5. Forss, D. A., and W. Stark, Anal. Chem., to be submitted.

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