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Ketogenesis following the feeding of ι-oxystearic ethyl ester.

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This investigation was undertaken to attempt to determine whether or not an even carbon fatty acid with a negative group attached to the α, γ, ε or some corresponding carbon atom would yield acetone on oxidation in the body.

ι-oxystearic acid was prepared by the method of the Saytzeffs,[1] and esterified in the usual manner with absolute alcohol and dry HCl. The ester was then homogenized to a cream with skimmed milk. The acetyl value of the ester was 80-85. Urinary nitrogen was determined by Kjeldhaly's method, acetone by that of Van Slyke & Fitz, organic acids by that of Van Slyke and Palmer, creatine and creatinne by Folin's microchemical method. Stool fat was determined by Sharp's nephelometric method.

The appended tables show a definite reduction in urinary acetone when the synthetic fat was fed, and stool fat analyses indicate that it was absorbed by the body. It is of interest to note that though the acetone falls, organic acid output remains almost unchanged, and it seems probable that the synthetic product is at least in part oxidized and not wholly stored by the body. It will be noted that the synthetic fat was not quantitatively hydroxylated; but in one experiment not here tabulated (in which ι-oxystearic ethyl ester, having an acetyl value of but 40 was fed), there was no reduction in ketosis. It, therefore, appears that the non-hydroxylated fraction of the product fed is ketogenic.

[1] Saytzeff, M. C., and A.,

METABOLISM EXPERIMENTS.

I

S. ♀ 1924		DIET Wt. lbs.	Fat CHO P Food	ι-ox.	Stool fat gm.	Fat absorbed gm.	URINE Vol.	N gm.	Acetone gm.	org. acids cc N/10 HCl
Sept.	27-28	151	54-60-185-	0	.... ..	.... ..	1350	8.88	.... ..	623
	28-29	151	54-60-185-	0	.... ..	.... ..	838	9.52	0.60	503
	29-30	151	20-60-200-	0	.... ..	.... ..	1500	11.35	0.92	713
	30- 1	152.5	20-60-200-	0	.... ..	.... ..	1380	10.45	6.44	1356
Oct.	1- 2	149.7	20-60-200-	0	.... ..	.... ..	2316	11.00	7.82	1572
	2- 3	148.7	20-60-200-	0	12.7	187.3	1700	10.77	6.04	1382
	3- 4	148	20-60-114-	100	27.8	186.2	1590	10.90	3.56	1186
	4- 5	148	20-60-200-	0	.... ..	.... ..	620	9.58	9.50	1106

II

W. ♀ 1924										
Sept.	27-28	125.5	54-60-185-	0	.... ..	.... ..	1350	12.60	.... ..	786
	28-29	125.0	54-60-185-	0	.... ..	.... ..	1920	12.35	2.64	938
	29-30	124.5	20-60-200-	0	.... ..	.... ..	1710	11.62	2.52	980
	30- 1	125.0	20-60-200-	0	.... ..	.... ..	1925	12.15	7.72	1538
Oct.	1- 2	123.0	20-60-200-	0	.... ..	.... ..	21.40	10.25	9.30	1854
	2- 3	122.5	20-60-200-	0	14.2	185.8	1295	12.10	7.50	1669
	3- 4	122.0	20-60-119-	100	35.6	178.4	1735	11.28	3.90	1220
	4- 5	122.0	20-60-200-	0	.... ..	.... ..	1390	10.87	5.53	1152

III

P. ♂ 1924.										
Nov.	6- 7	182	77-70-204-	0	.... ..	.... ..	.....	.... ..	.. ....	.....
	7- 8	181.5	77-70-204-	0	.... ..	.... ..	2325	12.7	.. ....	535
	8- 9	.....	77-70-204-	0	.... ..	.... ..	2480	12.3	0.12	629
	9-10	179	20-70-229-	0	.... ..	.... ..	1810	11.6	0.52	558
	10-11	178	20-70-229-	0	.... ..	.... ..	2572	14.2	2.75	859
	11-12	177	20-70-229-	0	.... ..	.... ..	2250	9.9	3.07	890
	12-13	175.5	20-70-229-	0	6.7	222.3	3240	13.7	3.42	1038
	13-14	176	20-70-105-150		22.8*	232.2*	2500	12.9	2.02	1088
	14-15	175.5	20-70-105-150				2245	12.2	1.86	1099
	15-16	175.5	20-70-105-150				2285	12.5	1.57	1086
	16-17	175.5	20-70-229-	0	.... ..	.... ..	2525	11.4	2.46	816
	17-18	175	20-70-229-	0	.... ..	.... ..	2360	11.2	2.40	853
	18-19	174.5	20-70-229-	0	.... ..	.... ..	2860	11.2	2.68	907
	19-20	174.5	20-70-170-	0	.... ..	.... ..	2260	11.3	1.28	761

* Per 24 hours, averaged from stools of 3 days, 14th through 16th.

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