ON THE NUTRITIVE VALUE OF SYNTHETIC FATS CONTAINING OXY-FATTY ACIDS.

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In continuation to the previous report⁽¹⁾ the author carried out the feeding experiment with synthetic fats containing oxy-fatty acids to compare their nutritive value with other kinds of fats. Oxy fatty acids, except ricinoleic acid, occur in natural fats only in negligible quantity, and so they seem to play only a subordinate rôle in the animal nutrition. But, according to Knoop, β -oxy acids are formed as the intermediate products of the successive degradation of long fatty acid chains. Further, the fate of other oxy acids having one or more OH group at different position has never been studied thoroughly. The feeding experiments with these fats will therefore contribute something to the knowledge of the fat metabolism in the animal body.

The author has prepared 13 kinds of oxy acids, which were carefully purified and their melting- and boiling-points as well as molecular weights thoroughly examined.

The preparation of triglycerides from these oxy acids was carried out by means of Twitchell's reagent as described in the first report.⁽¹⁾ But, lactic, dioxyundecylin, dioxystearin and trioxystearin could not be prepared by this method, probably these oxy acids being dehydrated by Twitchell's reagent and subsequently decomposed on heating; and so they were previously acetylated and converted into acetylated glycerides.

Beside these synthetic fats, the author used also the mixture of these oxy acids and glycerine. Furthermore, the nutritive value of ricinolein, acetyl ricinolein and ricinoleaidin were compared one another. The method of feeding used here was exactly the same with that of the former experiment,⁽¹⁾ i. e. the young rats were first fed with a limited quantity of basal diet (9 grams per day per rat), and when the growth was stopped they were supplied with the test diet containing 5, 10 and 20 % of the fats under examination to the basal diet, respectively, and the growth induced thereby were compared each other. These experiments were carried out in the same season and possibly under the same condition.

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The results thus obtained were as follows :

(1) The growths induced by adding 5 % of each fat to the basal diet were shown in the following order :

1. Acetylricinolein	13.5g.	2. Ricinolein	4.5g.
3. Diacetoxystearin	4.5g.	4. α -Oxystearin	3g.
5. 1 2-Oxystearin	2.5g.	6. α -Oxypalmitin	2g.
7. Lactic acid & Glycerin	1.5g.	8. Trioxystearic acid & Glycerin	1.5g.
9. Monolactin	1g.	10. Dioxyundecylic acid & Glycerin	1.0g.
11. Triacetoxystearin*		12. Dioxystearic acid and Glycerin*	
13. Diacetoxundecylin*		14. α -Oxyheptylin*	
15. α -Oxymyristin*		16. Ricinoelaidin*	

FIG. 1.

Showing the increase of body weight after adding 5 % of Sample to the basal diet,

(2) By adding 10% of each fat :

1. Acetylricinolein	58.5g.	2. 1 2-Oxystearin	24.5g.
3. Dioxystearic acid & Glycerin	19.0g.	4. Monolactin	19.0g.
5. Diacetoxystearin	18.5g.	6. α -Oxystearin	17.0g.
7. α -Oxystearic acid & Glycerin	7.0g.	8. α -Oxypalmitin	4.0g.
9. Ricinolein	3.0g.	10. Dioxyundecylic acid & Glycerin*	
11. Trioxystearic acid & Glycerin*		12. Ricinoelaidin*	
13. Triacetoxystearin*		14. Diacetoxundecylin*	
15. Lactic acid & Glycerin*		16. α -Oxyheptylin*	
17. α -Oxymyristin*			

(3) By adding 20% of each fat :

1. Acetyl ricinolein	63.0g.	2. Dioxystearic acid & Glycerin	18.0g.
3. 1 2-Oxystearin	16.5g.	4. Diacetoxystearin	4.5g.
5. α -Oxystearin	2.5g.		

FIG. 2.

Showing the increase of body weight after adding 10% of Sample to the basal diet.

FIG. 3.

Showing the increase of body weight after adding 20% of Sample to the basal diet.

group, rather than the number of OH groups in the molecule.

5) The nutritive value of ricinolein is greatly improved by acetylation, but as to dioxundecylin, dioxystearin and trioxystearin, the acetylation had little effect upon the nutritive value.

6) The improvement of the nutritive value of ricinolein by acetylation may be due to the formation of different products by breaking of its molecule.

7) Ricinolein was found to be better than its solid isomer, ricinoelaidin.

ON THE DISTRIBUTION OF A NEW THIOAMINO-ACID.

by Satoru OHDAKE.

(Abstract from the Original Paper)

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In 1924, U. Suzuki, T. Mori and the author isolated a new sulphur compound from the alcoholic extract of yeast, and gave the empirical formula $C_{11}H_{15}NSO_3$ to it. Boiled with diluted acids, it was hydrolysed easily to Adenin ($C_5H_5N_6$) and a new thiosugar ($C_6H_{12}SO_4$): so the authors concluded, this compound should be adenyI-thiomethyl-pentose. (U. Suzuki, S. Ohdake, and T. Mori :- The Journ. of the Agricultural Chemical Society of Japan. Vol. I No. 2 p. 127-136, 1924 and Biochemische Zeitschrift, B. 154, Heft. 3/6 S. 278-289, 1924.)

On studying further the alcoholic extract of yeast, the author isolated a new thioamino-acid in the following way :- The alcoholic extract of yeast was evaporated under diminished pressure to a syrupy consistence and dissolved in a little water. A concentrated tannin solution was then added, the precipitate thus formed, was collected, decomposed with baryta water and filtered. The filtrate, freed from an excess of baryta, was evaporated to a small volume, when the crystals of adenyI-thiomethyl-pentose separated out which were filtered off. To this filtrate, strong alcohol was added enough to make the alcoholic content of the mixture 80% by volume. The voluminous precipitate thus formed, was filtered by suction, and recrystallised several times from diluted alcohol. The crystals were found to be the mixture