curves thus obtained in clinical cases tended to show a non-linear portion during the initial 2-3 hours and followed by a linear portion thereafter. The latter portion shows the absorption rate of the labeled fat, and is quantitatively expressed by half life T½ or rate constant K. The former portion is disfcussed below.

II. Factors which influence on the blood curve

1) Gastric emptying time, and mixture and digestion with duodenal juice

By studying the absorption curves in clinical cases of total gastrectomy, and obstructive jaundice, with simultaneous administration of ^{125}I-triolein to the stomach and ^{131}I-triolein to the duodenum, it was found that the non-linear portion of the absorption curve was affected by these factors.

2) Carrier

Comparing the absorption curve following the injestion of a small amount of milk as a carrier with the curve following 180 ml. of milk, 0.5 Gm. of butter per kg. of bodyweight, and two pieces of bread in the same patient, the former's half life was distinctly shorter than the latter's. This fact shows the importance of quality and quantity of the carrier.

3) Stability of the labeled fat

^{131}I-triolein and Na ^{125}I was simultaneously administered to the dog whose thoracic duct had been canulated. ^{131}I in the lymph was abruptly increased after 3 hours, and above 90% of it was TCA-precipitable. ^{125}I in the blood was abruptly increased by 1 hour, but ^{131}I in the blood was increased slowly and was kept in this state after 3 hours. These results shows that the labeled fat is relatively stable during digestion and absorption of it.

4) Commercial triolein and oleic acid

Commercial ^{131}I-triolein and oleic acid were analysed by thin layer chromatography autoradiography. It was found that these commercial preparations were radioactively impure. Accordingly we have prepared pure ^{125}I-triolein by thin layer chromatography, and administered it with commercial ^{131}I-triolein simultaneously to a patient to compare the absorption curves. The result revealed slight difference in absorption of both preparations.

5) Radioactive triolein curve in the blood

For the study of absorption and digestion with the labeled fat, it is not correct in strict sense to count the radioactivity in untreated plasma. Therefore, we have extracted and separated triolein in the plasma by thin layer chromatography following the injestion of labeled fat, and counted it. This absorption curve was different from the one of untreated plasma, but the difference was not remarkable.

Digestion and Absorption Test Using Triolein or Oleic Acid

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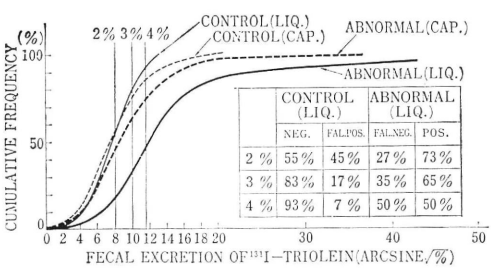
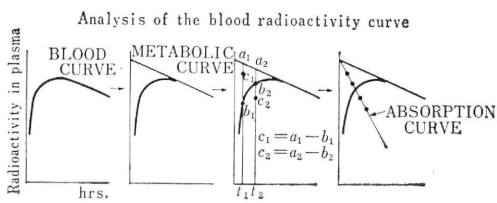


	CONTROL (LIQ.)		ABNORMAL (LIQ.)	
	NEG.	FAL.POS.	FAL.NEG.	POS.
2 %	55%	45%	27%	73%
3 %	83%	17%	35%	65%
4 %	93%	7 %	50%	50%



Sixteen years have passed since ^{131}I labeled fat was first used as a new aid for digestion-absorption test on experimental animals by

Rutenberg and on human subjects by Stanley and Thanhauser. There were some considerable differencies between those investigations on the ^{131}I-fat test, which have been done during this period. A discussion on this was appeared elsewhere (M. Masuda, S. Hosoda et al: Clinic All Round; Volume 12, No. 7, July 1963).

During this 6 years, 315 cases of ^{131}I-triolein test and 190 cases of ^{131}I-oleic acid test have been performed in the authors', unit. This paper is the summarized result of this study period.

There were 20 items we were concerned about, when we discussed about ^{131}I-triolein test: e.g. 1. Which gives more reliable data for digestion and absorption function, fecal radioactivity or blood radioactivity level? 2. Is thyroid blockade with Lugol solution necessary? 3. Liquid test meal, or capsulated test meal? 4. Is the cold meal necessary? What is the composition of the cold meal? 5. What is the normal limit of the fecal excretion ratio

Thyroid blockade with Lugol solution was seemed to be unnecessary when you used fecal radioactivity excretion, unless the subject has hyperfunctional state of his thyroid gland.

There was a significant correlation ($r=0.54$) between fecal fat amount (chemically assayed) and ^{131}I fecal excretion (% of administered dose), whereas there was no direct relation between fecal fat amount and blood ^{131}I level. Therefore, fecal radioactivity excretion ratio was revealed to be more reliable for the digestion-absorption function. Further investigation will be necessary on the contradictory result, that the fecal radioactivity excretion and the blood radioactivity level was in a reciprocal correlation ($r=-0.44$).

Cumulative frequency distribution of fecal radioactivity excretion ratio was observed in malabsorption group and in control group (Fig. 1). Continued lines represent ^{131}I-triolein tests with liquid test meal, containing 50 μc of ^{131}I-triolein plus 1 ml/Kg of cold meal composed of pea-nut oil-water-tween 80 (200:200:15), while broken lines represent the tests with capsulated test meal.

Liquid test meal containing radioiodinated triolein or oleic acid (not shown in Fig. 1) showed a considerable difference between control group and malabsorption group. However, capsulated test meal without any cold meal (or carrier) did not show this difference, so that it was difficult to draw a line between normal and abnormal range.

If the normal range of triolein test was settled under 2% fecal excretion with liquid test meal, false negative would be 27%. If the abnormal range was settled over 4%, false positive would be 7%. If the normal range of oleic acid test was considered to be under 2%, false negative would be 30%. If the abnormal range was over 4%, false positive would be 20%.

The malabsorption group was further divided into 6 groups; 2A (intestinal disease), 2B (postoperative decrease in absorptive surface), 2C (endocrine disturbances), 3A (pancreatic insufficiency), 3B (hepatobiliary diseases) and 3A plus 3B. The mean fecal excretion ratios of each group were as follows; triolein capsule, control group 2.2%, 2B 2.3%, 2C 2.7%, 3A 3.1%, 3B2.1%, 3A+3B 3.3%; liquid triolein C 2.1%, 2A 4.7%, 2B 10.0%, 2C 18.8%, 3A 4.4%, 3B 7.3%, 3A+3B 8.3%; oleic acid capsule C 2.0%, 2A 2.3%, 2B 2.8%, 2C 4.0%, 3A 3.3%, 3B 1.9%, 3A+3B 3.5%; liquid oleic acid C 2.1%, 2A 4.2%, 2B 13.7%, 2C 22.0%, 3A 1.3%, 3B 4.1%, 3A+3B 4.2%, respectively.

In order to observe the relationship between ^{131}I-triolein test and the pancreatic function, secretion test was performed on the same subject. ^{131}I fecal excretion ratio showed a considerable correlation with lipase amount in pancreatic juice after secretion stimulation.