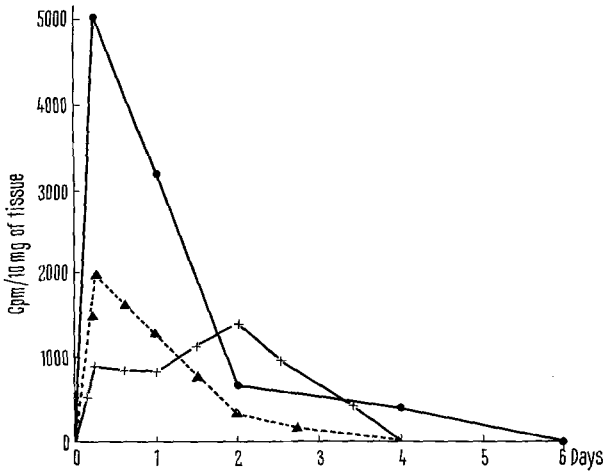

Relative concentration of radioactivity in different rat organs after one single dose of L-VTO-S35. The dose was 100 μg of L-VTO with a radioactivity of about 22 μCi S^{35}. ———, thyroid; +—+—+, liver; △--△--△, kidneys.

a tissue grinding device (Ultra-Turrax) and suspension of the homogenates in Bray's solution.

The rats used were males weighing 120–140 g, the total number of animals being 80. The rats were kept on a moderate iodine diet, containing about 4 μg/day, and in equal conditions.

Results. As can be seen from the Figure, the L-VTO-S35 seems to concentrate in the thyroid even 5-fold over the concentration in the liver or the kidneys, when calculated per weight unit. A similar result was seen also with the smaller dose of L-VTO-S35.

The radioactivity seems to remain in the thyroid up to 6 days, whereas in the liver and kidneys not more than 4 days. In all organs studied the concentration seems to be highest during the first day after the injection. In the liver the concentration remains at about the same level for 3 days.

Discussion. Like the synthetic antithyroid drugs propyl-thiouracil and methimazole[6], VTO also seems to be concentrated, especially in the thyroid. The long delay of this compound in the thyroid, up to 6 days after one single dose, makes a rather high accumulation possible, when long-term feeding is used. This could well explain the high biological activity of this substance shown earlier[1,2]. Further studies on long-term feeding with L-VTO-S35 are needed and are in progress. Our results are in accordance with the findings of GREER[7], who studied the excretion of VTO in the urine during 3 days after one single dose, and showed that during that time only 10% of the dose was excreted as VTO. As pointed out by LANGER[8], some metabolites of VTO may also be excreted into the urine.

Zusammenfassung. Nachweis mittels Radioschwefel ^{35}S, dass das in der Natur vorkommende Strumigen 1-5-vinyl-2-thio-oxyzolidon offenbar in der Schilddrüse in fünffach grösserer Konzentration gespeichert wird als in Leber und Niere.

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An Immediate Effect of Thyroxine in the New-Born Pig

There is a high level of activity of the thyroid gland in the early post-natal period of the pig's life[1], at which time the animal also shows a marked capability for heat production when exposed to the cold[2]. The highest level of free thyroxine in the pig's blood has been found in animals less than 1 day old[3,4]. During the course of several days, however, increasing amounts of thyroxine are bound, mainly to the α-globulin fraction of the plasma proteins, so that the level of free thyroxine falls. By about 8 days of age thyroxine and the thryoxine-binding protein are in equilibrium.

From this the question arises: does the increase in the thyroxine-binding capacity of globulin in any way modify the response to injected thyroxine? After about 8 days of age, thyroxine which is injected may be expected to become bound, with the result that its metabolic effect will be diminished. Before this time, however, an injection may produce an increase in free thyroxine which could result in a rapid metabolic response in spite of the high level of free endogenous hormone in the first few days after birth. It was in order to test any influence of age on the time-course of action of injected thyroxine that the present experiments were undertaken.

The rate of oxygen consumption in the pig was measured in a closed system with automatic recording which permitted observations to be made continuously for periods up to 24 h. The animal was provided with water while in the chamber but not with food; in consequence the metabolic rate in the control pigs declined continuously during the course of the experiment (see Table).

The pigs used in the experiments were of the Large White breed, a total of 51 in number, aged from 1 h to 19 days, and with a range of body weight from 0.81–3.35 kg. They were all born on the Institute farm.

Each animal was removed singly from the sow. It was weighed, the rectal temperature was measured by a thermojunction inserted 5 cm in the rectum, and the pig placed in the metabolism chamber. The chamber temperature was adjusted to 32 °C for pigs in the first few days

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The immediate effect of thyroxine on metabolic rate in the pig at 1–11 days of age

	O_2 consumption ml/kg/min		O_2 consumption in % of initial value		
	Saline	Thyroxine	Saline	Thyroxine	P
Before injection	19.6 ± 0.6 (13)	17.5 ± 0.6 (14)	100%	100%	
Time after injection (h)					
1–2	17.3 ± 0.8 (13)	18.1 ± 0.9 (14)	91.8 ± 2.0	97.5 ± 1.5	$0.01 < P < 0.05$
3	18.1 ± 0.6 (13)	19.1 ± 1.2 (14)	92.6 ± 2.4	108.7 ± 5.4	$0.01 < P < 0.05$
4	18.0 ± 0.7 (13)	20.1 ± 1.3 (14)	91.4 ± 1.4	114.3 ± 5.5	$P < 0.001$
5	17.4 ± 0.5 (13)	19.2 ± 1.2 (14)	89.1 ± 1.9	109.5 ± 5.6	$0.001 < P < 0.01$
7	17.2 ± 0.8 (13)	16.7 ± 0.7 (13)	88.0 ± 1.9	97.2 ± 3.4	$0.01 < P < 0.05$
10	16.2 ± 0.5 (13)	16.0 ± 0.6 (13)	82.4 ± 1.6	92.2 ± 3.0	$0.001 < P < 0.01$
13–15	16.1 ± 0.6 (9)	16.0 ± 0.6 (10)	80.0 ± 2.2	91.8 ± 1.9	$P < 0.001$

Means and standard errors are given, with numbers of animals in brackets. P, comparison between saline and thyroxine results.

following birth, and to 30 °C for animals of 7–11 days of age. An equilibration period of 30 min was allowed before the initial level of oxygen consumption was measured. Following the s.c. injection of either thyroxine solution or saline (for the controls) a further period of measurement was begun. In some experiments rectal temperature instead of oxygen consumption was measured at 30 min intervals.

A solution of L-thyroxine (L. Light and Co. Ltd.) in normal saline was prepared immediately prior to injection. Both the thyroxine solution and the saline for the control animals were adjusted between pH 7.5 and 8.0 by addition of 0.1 N sodium hydroxide.

In unsuckled pigs during the first post-natal day, thyroxine did not produce elevation of either rectal temperature or oxygen consumption rate. In suckled pigs of 1–3 days of age, however, increases occurred in both quantities, relative to the saline controls, with the peak effects at 3–4 h after injection ($P < 0.01$); the approximate increase in rectal temperature was 0.5 °C. The effect on metabolic rate was also present at 8 days of age, with the peak at 5–7 h after injection ($P < 0.01$), although a rise in rectal temperature did not take place either in this age group or in 19-day-old pigs.

Mean values for the rate of oxygen consumption at intervals up to 15 h following injection have been calculated from the collected results obtained from pigs up to 11 days of age, but excluding the unsuckled new-born, which showed no response. These figures are given in the Table, both as ml oxygen/kg min and as percentages of the initial values, in order to facilitate comparison between animals showing variation in absolute levels. A significant effect is sustained throughout the period of observation.

The immediate effect of thyroxine in the intact animal, as opposed to the commonly observed latent effect, does not appear to have been described previously, although such an effect has been observed in hypophysectomized or thyroidectomized rats[5]. The effect is evident during the first week after birth, indicating the highest sensitivity of the animal to thyroxine at this time. In the older pig the absence of the rise in rectal temperature and the rather later peak in metabolic rate could be related to the increased binding of injected free thyroxine by α-globulin, with consequent delay in the hormone's action. The absence of the effect in the first part of the post-natal period may be related to lack of development of target organs at that time. This hypothesis is consistent with the observation of the maximum effect at about 5 days of age. Another possibility is that the effect is due to thyroxine stimulating the release or augmentation of action of adrenaline, to which the new-born pig responds with a rise in metabolic rate[6].

Résumé. Deux augmentations, l'une immédiate et l'autre latente, s'observent dans la consommation d'oxygène après injection sous-cutanée de thyroxine au porcelet nouveau-né. L'augmentation immédiate présente un maximum environ 4 h après l'injection. Elle a été la plus forte chez les porcelets de l'âge 1 à 4 journées.

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The Corticotroph Cells of the Anterior Pituitary Gland of a Reptile: *Cnemidophorus l. lemniscatus* (Sauria, Teiidae)

Up to the present, corticotroph cells have not been identified in the reptile hypophysis, although the existence of corticotrophin therein is known[1]. The available data indicate 2 types, both acidophilic, of non-mucoproteinaceous secretory cells in the pars anterior of reptiles: one localized in the caudal zone and composed of numerous and generally small elements, which are usually considered as alpha cells, and the other situated rostrally and formed by elongated cells, named X on account of their uncertain function[2]. The same two types of cells were found in the above-mentioned species[3]. The

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