

Effect of Goitrogenic Factor on Metabolic Rate of Rats.

(b) Dr. Lawrence Malcolm (1937) has made measurements of the metabolic rate of rats on an active turnip-seed diet supplied by us, and has permitted us to summarize the results here.

Table II.

Diet.	Oxygen Consumption, in Litres per Square Metre, per Twenty-four Hours.				Difference.
					Per Cent.
Control (steamed rape-seed) ..	191 (15 determinations) ..	..	..	..	..
Active (turnip-seed) ..	174 (17 determinations) ..	..	..	..	—8·9

The interpretation of the results was complicated by a progressive fall in oxygen consumption during the experiments, presumably due to a deficiency in the diet. The histological examination of the thyroid glands showed in the rats on the active diet an extreme hyperplasia with many mitotic figures. The results are consistent with either of the two hypotheses :—

- (1) Active *Brassicae* seeds contain a substance with a depressant action on metabolism ; or
- (2) They interfere seriously with the assimilation of iodine.

The thyroid hyperplasia is in each case compensatory. A direct stimulating action on the thyroid, which would entail an increase in metabolic rate, is excluded.

It is proposed to repeat and extend these observations.

CHAPTER III.—IODINE METABOLISM.

For the purpose of making a survey of the level of iodine metabolism throughout New Zealand, we have made use of estimations of the twenty-four-hour urinary iodine excretion. We have been indebted to outside helpers for the difficult task of collection of twenty-four-hour specimens of urine. In many cases we have been unable to secure twenty-four-hour specimens from districts we desired to study.

The twenty-four-hour excretion of iodine as an index of iodine intake has the advantages that the estimation is relatively easy and that fewer analyses are necessary to establish the level of iodine metabolism than would be necessary if foodstuffs were studied. The results of all determinations are given below.

Table III.—Urinary Iodine Excretions, in Micograms per Day: Results of All Determinations.
(Median values are shown at foot of each column.)

New Zealand.											Outside New Zealand.						
Cromwell.	Waikato.	Otago.	Gisborne.	Rangitikei.	Whangarei.	New Plymouth.	Thames.	Stewart Island.	Wanganui.	Clydevale.	Melbourne.	Perth.	Brisbane.	Abalang (Gilbert and Ellice Islands).	Sydney.	Adelaide.	Samoa.
11	17	21	20	23	32	10	38	21	27	30	39	47	61	55	83	80	80
13	19	27	24	27	33	24	39	25	31	37	42	63	78	70	99	82	128
18	27	30	26	39	35	27	49	37	32	45	59	63	83	72	107	114	153
22	31	34	27	41	39	27	53	42	53	56	63	71	90	74	118	119	192
23	35	37	31	43	39	32	65	46	70	57	72	77	91	91	145	120	209
23	39	37	35	45	41	32	66	51	87	58	78	79	97	107	147	121	230
23	39	41	42	45	41	33	111	61	144	65	79	80	104	114	159	173	
24	46	41	43	77	42	37		80	285	66	88	85	122	119	165	175	
24	61	42	46	80	46	41		82		76	176	98	128	135	288	182	
25	119	50	54	101	51	46		97		145	267	110	170	136	613	267	
27	167	59	55	123	53	47		98		155	401	161	209	168		885	
29	305	78	55	155	54	48		142		228	834	687		232		894	
31		82	61		64	49											
32		85	63		66	58											
47		97	76		85	58											
48			87		93	68											
58					104	70											
					108	78											
						81											
						83											
						87											
						87											
						98											
						110											
						112											
						914											
24	39	41	43	45	48·5	53	53	56	61	61·5	78·5	79·5	96	110	146	147	172

The median values have been given rather than the mean values, as the latter are in some cases extensively influenced by occasional high iodine excretions. These high values are attributed to the taking of medicines containing iodine or iodide, and in some cases this was verified by subsequent inquiry.