

STUDIES ON THE PRESERVATION OF GLANDS

III. The Preservation of Thyroid Glands

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THE thyroid gland, where the method of choice for medication is oral administration of the desiccated whole gland, offers an example *par excellence* of the principle of Organotherapy. This mode of medication presupposes a certain degree of stability on the part of the active principles towards heat treatment at moderately high temperatures and extraction with lipoidal solvents—two fundamental processes involved in the desiccation of the gland. The investigations that we have carried out on the changes undergone by the gland during storage under various conditions, go to show that the active principles of the gland possess a remarkable stability, in direct contrast to the Adrenal and the Pituitary glands.

It is now an established fact that the total organic iodine content is a better index of the biological potency of thyroid extracts than the thyroxine iodine content. Any deterioration undergone by the stored gland might, in part

following table are represented values for total iodine, thyroxine iodine, inorganic iodine and organic iodine in desiccated specimens of thyroid glands which were stored under a variety of conditions, the various assays being carried out by methods described in the *British Pharmacopœa*. Assays were also carried on two specimens of whole gland extracts, one of which, a desiccated product, had been stored at room temperature since 1941 and the other, a dried-gland preparation, had been stored in the frigidaire since 1941, until it was removed in November 1943 for extraction of fat.

It will at once be apparent from the table that the figures for thyroxine iodine and organic iodine percentages are remarkably constant throughout, irrespective of whether the glands are chilled immediately in dry ice or transported to the laboratory in ordinary ice or whether they are stored at 0° C. for two days or frozen for one month. Even when

	I Total Iodine (% of desiccated gland)	II III Thyroxine Iodine		IV V Inorganic Iodine		VI VII Organic Iodine (by difference between I & IV average values)	
		(a) % of desiccated gland)	(b) % of total I ₂ (average)	(a) % of desiccated gland	(b) % of total Iodine average	(a) % of desiccated gland	(b) % of total I ₂
1. Cattle Glands brought to the laboratory chilled in 'dry ice' and desiccated immediately	0.997 0.994	0.397 0.397	39.86	0.0167 0.0161	1.67	0.980	98.33
2. Cattle Glands brought in ice and desiccated immediately.	0.917 0.922	0.374 0.374	40.65	0.0146 0.0149	1.60	0.935	98.40
3. Sheep glands treated as in 1.	0.691 0.689	0.286 0.285	41.46	0.0180 0.0197	2.68	0.671	97.32
4. Sheep glands treated as in 2.	0.623 0.630	0.254 0.268	41.62	0.0157 0.0157	2.50	0.611	97.50
5. Cattle glands stored at 0-50 for 2 days.	0.931 0.933	0.359 0.357	38.41	0.0245 0.0266	2.74	0.906	92.26
6. Glands (cattle) frozen for 1 week	0.954 0.968	0.353 0.355	36.84	0.0235 0.0210	2.71	0.930	97.29
7. Glands (cattle) frozen for 2 weeks.	0.953 0.958	0.364 0.378	38.81	0.0213 0.0202	2.17	0.935	97.83
8. Glands (cattle) frozen for one month.	0.888 0.885	0.352 0.359	40.14	0.0180 0.0190	2.07	0.868	97.93
9. Dried glands (cattle) stored at 0-5 for 2 years.	0.928 0.922	0.333 0.380	41.22	0.0226 0.0236	2.50	0.902	97.50
10. Desiccated glands (cattle) stored at 30°C. for 2 years.	0.923 0.939	0.357 0.385	39.86	0.0182 0.0203	1.80	0.912	98.20

at least, be indicated by a decrease in the organic iodine content and a corresponding increase in the inorganic iodine. Assay of the acid-insoluble iodine, i.e., the thyroxine fraction, would also be a valuable index, since it would indicate any decomposition undergone by thyroxine into acid-soluble physiologically inactive organic iodo-compounds. In the

the dried glands (both before and after removal of fat) are stored for two years, either at 0° or at 30°, the changes undergone by the extracts in chemical composition are, for all practical purposes, negligible.

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