

My 14/79

I hope you find this report
and I hope you can
help account for the
findings.

UNEXPECTED ¹³¹I IN ENGLISH SHEEP

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Very,
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ABSTRACT

A small quantity of well-identified ^{131}I was found in thyroids of sheep killed in Birmingham, England, thirty-two days after the accident at Three Mile Island. However, no ^{131}I was found in human or cattle thyroids from Philadelphia, PA.

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For the past 25 years, we have continuously monitored ^{131}I in animal thyroids from many sources (1, 2). During the six weeks following the announced nuclear accident at Three Mile Island, Pennsylvania (PA) (3), animal and human thyroids have also been monitored from Philadelphia, PA. No thyroids were available to this laboratory from the immediate vicinity of the accident.

All thyroids were tested in a 5" scintillation crystal with a 1" well and counted for at least 80 minutes as described in 1975 (1). When radioactivity was found or suspected, a 200-channel gamma spectrum was accumulated for 1000 minutes, between 0.07 and 0.7 MeV.

No detectable ^{131}I (<0.1 pCi/g) was found in any of 16 human thyroids from Philadelphia or in 12 human thyroids from Memphis, obtained from April 3 through April 21 from subjects 4 months to 75 years old. No ^{131}I was found in thyroids of 18 cattle slaughtered in Philadelphia or 40 cattle from Memphis from April 12 to May 9.

One group of 20 sheep thyroids from Birmingham, England, slaughtered April 30, contained ^{131}I . The quantity was small, but confirmatory gamma spectra were obtained on four of five groups of the glands. Table 1 summarizes the data and compares the values with recent maxima and minima measured during the past 19 months.

It may be difficult to prove the origin of the April 30 increment of ^{131}I in English sheep; the quantity was low and the half-life only eight days. It is curious that no ^{131}I was found in cattle slaughtered in Philadelphia, but most of those cattle are believed to have originated west of Three Mile Island.

The amount of radioiodine found in English sheep of April 30 was similar to the amount found in English sheep in January, 1979, and only 1.3% of the amount found in April, 1978, and 0.3% of the amount found in October, 1977.

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The possibility must be considered that ^{131}I found in sheep thyroids from England in April, 1979, may have originated at Three Mile Island, PA; however, the ^{131}I could have been released at a different unknown and almost coincident source. Either case shows the importance of continuous monitoring of animal thyroids as long as nuclear fission is utilized anywhere.

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Table 1. Recent maxima and minima of ^{131}I in animal thyroids in England and Tennessee, compared to increases in England during April, 1979.

Slaughter Date			Average \pm SD pCi ^{131}I /g thyroid (10-20 glands each date)		Chinese nuclear tests in atmosphere (4)
Year	Mo.	Day	English sheep	Tennessee cattle	
1977	9	15	<0.1	<0.1	
	10	18	200 \pm 59*	338 \pm 180*	September 17
1978	2	28	<0.1	<0.1	
	4	3	52 \pm 7*	97 \pm 85*	March 14
	7	24	<0.1	<0.1	
	10	31	1.3 \pm 1.1**	<0.1	[unknown source]
	12	11	<0.1	<0.1	
					December 14
1979	1	2	0.5 \pm 0.2	1.1 \pm 0.7*	
	1	21	1.5 \pm 0.03*	<0.1	
	2	12	0.1	<0.1	
	3	18	<0.1	<0.1	
----- March 28, accidental release began at Three Mile Island, PA (3) -----					
	4	15	<0.1	<0.1	
	4	23	0.2 \pm 0.1	<0.1	
	4	30	0.7 \pm 0.3*	<0.1	

*Identity of ^{131}I confirmed by γ spectra.

** ^{131}I confirmed by γ spectra on cattle from Ulm, Germany, on October 12, 1978,
but no spectral information obtained on these English sheep.

References

1. L. Van Middlesworth, Nucleonics 12: 56 (1954); Science 123: 982 (1956); Health Physics 9: 1197 (1963); Health Physics 29: 861 (1975). Additional references are listed in these reports.
2. Grateful appreciation is expressed to the following correspondents for supplying animal thyroids: Mr. A. Wilson and Mr. J. D. Pensel, Chief Veterinary Officers, Environmental Health Department, Birmingham, England; and Dr. Ulrich Loos, Ulm, Germany.
3. Announced by Associated Press.
4. Announced by Department of Energy, Washington, D. C.
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