

STATE OF WISCONSIN

1983 - 1984

MILK MONITORING NETWORK



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## INTRODUCTION

The State of Wisconsin, Department of Health and Social Services, conducts its milk monitoring program to continue the surveillance of nuclear fallout resulting from previous weapons tests as well as any nuclear tests that may be conducted in the future. The monitoring program has been conducted since 1962 and includes five major milk sheds in the state. This report covers the time period January, 1983 through December, 1984.

## PROGRAM DESCRIPTION

The monitoring program consists of the bi-weekly or monthly collection of processed milk from the following five major milk sheds: Eau Claire, Green Bay, Rice Lake, Wausau and Whitewater as well as a sample from the University of Wisconsin in Madison. A gamma isotopic analysis as well as an analysis for strontium-90 is performed on the milk samples.

## PROGRAM MODIFICATIONS

Arrangements were made with the Wisconsin Department of Agriculture for the collection of the milk samples in the following areas: DePere (Green Bay), Rice Lake, Wausau, and Whitewater. Beginning with the February, 1984 collection, the milk samples were collected by the Wisconsin Department of Agriculture.

Beginning in January, 1984, milk samples were collected from the six areas on a monthly basis. Data collected from the previous few years indicated that a monthly collection is sufficient. The frequency of collection can be increased if it is deemed necessary at a later date.

## ANALYTICAL PROCEDURES

### Milk - Gamma Isotopic

A 3.5 liter sample is placed in a Marinelli beaker and analyzed on a GeLi detector. The sample is counted for 100 minutes using 2048 channels at 1.0 Kev per channel. Scan the gamma spectrum for any peaks and print out regions of interest which would include possible fallout attributable radionuclides. Calculate the activity for isotopes in the regions of interest, regardless if they are above or below the minimum detectable concentration, correcting for counter efficiency and for decay.

### Milk - Strontium 90

Monthly composites are made if more than one milk sample is collected for that month. Strontium and yttrium carriers are added to milk which has been aged two to four weeks. A one liter sample is passed successively through cation and anion exchange columns. The yttrium

is eluted from the anion resin with hydrochloric acid, precipitated as yttrium oxalate, filtered and weighed to determine chemical yield. The sample is beta counted in an external gas flow proportional counter. Calculate activity correcting for counter efficiency and for decay.

#### QUALITY ASSURANCE

The analysis of the samples is performed under subcontract with the State Laboratory of Hygiene (SLH). SLH maintains their own quality assurance program.

Analytical procedures provide for routine replicate analyses to verify methods and instrument operation. Traceable sources are used to regularly calibrate the counters and daily performance checks are made between calibrations. In addition, quality control charts are maintained on the counters.

SLH participates in the EPA Cross Check program. The quality assurance program that the SLH participates in include analysis of blind samples, air filters, food, milk, gamma in water, alpha-beta in water, iodine in water, strontium in water and tritium in water. EPA Cross Check results can be reviewed at the State Laboratory of Hygiene or at the Section of Radiation Protection.

#### SENSITIVITIES AND ERROR

Following the recommendations of the Health Physics Society, detection limits will be expressed as a minimum detectable concentration (MDC). The minimum detectable concentration or MDC is an "a priori" estimate of the capability for detecting an activity concentration by a given measurement system, procedure, and type of sample. The MDC should not be viewed as an absolute activity concentration that can or cannot be detected. Minimum detectable concentrations (MDC) are based on the analysis performed and for gamma isotopic analysis have been calculated for a zero decay time.

The MDC for each radioisotope in Table 1 has been calculated from the following equation:

$$MDC = \frac{4.66 s_b}{E * V * 2.22 * Y * S * \exp(-dt)}$$

Where:

MDC is the "a priori" lower limit of detection as defined above, as picocuries per unit mass or volume,

$s_b$  is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, as counts per minute,

E is the counting efficiency, as counts per disintegration,

V is the sample size in units of mass or volume,

2.22 is the number of disintegrations per minute per picocurie,

Y is the fractional radiochemical yield, when applicable,

S is the self-absorption correction factor,

d is the radioactive decay constant for the particular radionuclide, and

t for environmental samples is the elapsed time between sample collection, or end of the sample collection period, and time of counting.

Guidelines adopted by the U.S. Environmental Protection Agency are used in the reporting of specific analyses. Results from specific analyses will be reported whether the results are negative, zero, or positive. Caution should be exercised in the interpretation of individual negative values. While a negative activity value does not have physical significance, it is significant when taken together with other observations which indicate that the true value of a distribution is near zero. This procedure will allow all of the data to be reported and will allow a statistical evaluation without an arbitrary cutoff of small or negative numbers. An estimation of bias in the nuclide analyses is then possible as well as a better evaluation of distributions and trends in the environmental data. It is important when reviewing the data in the following tables to compare the reported result to the actual minimum detectable concentration (MDC) for that analysis.

Results for specific analyses will be reported as an activity followed by an error term for that analysis. The error term is a plus or minus counting error term at the 2 sigma (95%) confidence interval and is printed as (+/-).

Table 1. Minimum Detectable Concentration (MDC).

Wisconsin Division of Health  
Section of Radiation Protection

	Milk (pCi/liter)
K-40	100
Sr-90	1.2
I-131	12
Cs-134	11
Cs-137	12
Ba,La-140	12

## SAMPLE COLLECTION SUMMARY

The number of samples collected and analyzed for the stated report period is listed in Table 2. An explanation for missing samples or data is, also, listed in Table 2.

Table 2. Sampling summary for 1983 and 1984.

Sample type	Collection and Frequency *a	Number of Locations	Number of Samples Collected	Number of Samples Missed
Sampling period		January - December 1983		
milk	G/BW	5	122	8
Sampling period		January - December 1984		
milk	G/M	6	68	3

### Missing Sample Report

Sample type	Date	Location	Explanation
milk	01/03/83	Green Bay	Sample was not collected.
milk	10/14/83	Madison	Sample was not collected.
milk	01/03/83	Rice Lake	Sample was not collected.
milk	11/13/83	Rice Lake	Sample was not collected.
milk	11/27/83	Rice Lake	Sample was not collected.
milk	12/05/83	Rice Lake	Sample was not collected.
milk	12/19/83	Rice Lake	Sample was not collected.
milk	1/84	Rice Lake	Sample was not collected.
milk	07/14/83	Wausau	Sample was not collected.
milk	9/84	Wausau	Sample was not collected.
milk	3/84	Whitewater	Sample was not collected.

\*a Collection type: G/ = grab  
Frequency: /M = monthly; /BW = bi-weekly



## RESULTS AND DISCUSSION

There were no atmospheric nuclear denonations for the reporting period of January, 1983 through December, 1984.

Radioisotopes detected above their respective minimum concentration (MDC) by Wisconsin are listed in Table 3. Naturally occurring potassium-40 (K-40) and strontium-90 (Sr-90), a fission product, were detected above their minimum detectable concentration in all samples or composites. The detected levels of activity for the other radionuclides were small amounts at or only slightly above their respective minimum detectable concentration. The average activity for strontium-90 (Sr-90), a fission product, for each individual sampling site for the period of 1983-1984 is listed in Table 4. The average activity for strontium-90 (Sr-90) for each individual sampling site shows little change from previous years. The strontium-90 activity does show some dependence on location within the state with slightly higher reported activities from northern Wisconsin than from southern Wisconsin. The individual analyses for gamma isotopic and strontium-90 activities are listed in Tables 6-11.

Using the MDC values listed in Table 1, dose calculations (mrem/year) were performed according to the mathematical models illustrated in USNRC Regulatory Guide 1.109 (equation C-13 on page 1.109-28). The dose calculations do not include doses resulting from naturally occurring radionuclides and would represent a minimum detectable dose based on Wisconsin Department of Health & Social Services measurements. The dose calculations are for an average individual and have been calculated for an average child in order to give the greatest dose. The calculated doses are listed in Table 5 on page 6 of this report and include calculated doses for the six (6) sampling sites from where milk samples were collected. From Table 5 it is noted that total body dose and bone dose are doses resulting from the detection of strontium-90 (Sr-90) above its minimum detectable concentration (MDC). The thyroid dose is the same for all six sampling sites resulting from the use of the minimum detectable concentration (MDC) value for iodine-131 (I-131). In general it can be stated that the present levels of radioactivity in milk are small, difficult to detect and are of little or no cause for concern regarding the use of Wisconsin milk products.

## REFERENCES

State of Wisconsin, 1979-1982, Milk Monitoring Network.

U.S. Environmental Protection Agency, upgrading Environmental Radiation Data, Health Physics Society Committee Report HPSR-1 (1980), EPA 520/1-80-012, August, 1980.

U.S. Environmental Protection Agency, Environmental Radiation Data, Report 12, April, 1978.

U.S. Nuclear Regulatory Commission Regulatory Guide 1.109, CALCULATION OF ANNUAL DOSES TO MAN FROM ROUTINE RELEASES OF REACTOR EFFLUENTS FOR THE PURPOSE OF EVALUATING COMPLIANCE WITH 10 CFR PART 50, APPENDIX I.

Table 3. Radioisotopes detected in milk samples for 1983 and 1984.

1983		
Radioisotope	# samples detected	range (pCi/liter)
K-40	122	1100 - 1700
Sr-90	58 (composites)	1.9 - 9.8
I-131	2	12.2 - 13
Cs-137	2	12 - 16
Ba,La-140	1	12

1984		
Radioisotope	# samples detected	range (pCi/liter)
K-40	68	1230 - 1620
Sr-90	68	1.6 - 10.4
I-131	1	12
Cs-134	2	11
Cs-137	2	12 - 17

Table 4. The average activity for strontium-90 (Sr-90) in milk samples for the period 1983-1984.

	1983	1984
Eau Claire	7.3+/-1.1	6.8+/-1.0
Green Bay	4.1+/-0.9	3.4+/-0.8
Madison	3.9+/-0.8	2.5+/-0.8
Rice Lake	7.0+/-1.2	6.5+/-1.1
Wausau	5.9+/-1.0	5.1+/-1.1
Whitewater	*a	3.1+/-0.8

\*a - Sampling started in February, 1984.

Table 5. Dose to an average individual (child) from ingestion of milk.

	Total Body (mrem/year)	Thyroid (mrem/year)	Bone (mrem/year)
all MDC values	<1.24	<11.7 *b	<4.78
Eau Claire	5.7+/-0.8 *a	<11.7 *b	22+/-3 *a
Green Bay	3.4+/-0.7 *a	<11.7 *b	13+/-3 *a
Madison	3.2+/-0.6 *a	<11.7 *b	13+/-2 *a
Rice Lake	5.5+/-0.9 *a	<11.7 *b	22+/-3 *a
Wausau	4.7+/-0.7 *a	<11.7 *b	18+/-3 *a
Whitewater	2.6+/-0.6 *a	<11.7 *b	10+/-2 *a

\*a - Doses resulting from the detection of strontium-90 (Sr-90) above its minimum detectable concentration (MDC).

\*b - Doses resulting from the use of the minimum detectable concentration (MDC) value for iodine-131 (I-131).



Table 6. Analysis of milk samples for 1983 and 1984.  
Eau Claire.

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Eau Claire 1983

Isotope Collection date	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90 * b
01-04-83	2.2	5.7	* a	-0.15	1440+/-80	
01-18-83	6.2	1.4	* a	1.2	1390+/-80	7.5+/-0.9
02-01-83	5.5	3.9	* a	2.0	1320+/-80	
02-15-83	5.0	4.9	* a	1.6	1400+/-80	5.9+/-0.9
03-01-83	0.6	4.7	* a	-0.2	1200+/-80	
03-15-83	-2.2	6.2	* a	-4.3	1310+/-80	
03-29-83	2.4	4.2	* a	-1.1	1310+/-80	7.9+/-0.8
04-12-83	6	5	* a	-1	1300+/-200	
04-26-83	0.7	6.1	* a	1.9	1230+/-80	7.8+/-0.9
05-10-83	0.3	1.7	* a	1.6	1250+/-80	
05-24-83	-3.5	7.0	* a	0.15	1210+/-80	9.8+/-1.0
06-07-83	3.2	1.6	* a	3.9	1550+/-90	
06-21-83	3.1	2.6	* a	1.3	1570+/-90	8.5+/-1.0
07-05-83	5+/-11	-1+/-9	2+/-8	11+/-11	1320+/-190	
07-19-83	0+/-12	2+/-8	1+/-9	6+/-11	1400+/-200	9+/-2
08-02-83	4+/-15	10+/-8	3+/-10	2+/-11	1400+/-200	
08-16-83	0+/-11	6+/-6	0+/-8	0+/-11	1600+/-200	
08-30-83	0+/-12	8+/-6	0+/-9	5+/-11	1300+/-200	7.6+/-1.1
09-13-83	* c	* c	3+/-13	-2+/-14	1400+/-300	
09-27-83	8+/-7	0+/-2	3+/-5	8+/-7	1560+/-190	5.5+/-1.1
10-11-83	2+/-7	-1+/-6	-2+/-7	5+/-8	1390+/-190	
10-25-83	* c	* c	0+/-8	2+/-9	1100+/-200	6.6+/-1.2
11-08-83	1+/-8	5+/-4	1+/-6	11+/-6	1310+/-180	
11-22-83	0+/-7	4+/-4	0+/-7	-2+/-8	1560+/-190	5.4+/-1.0
12-06-83	* c	* c	5+/-6	11+/-7	1330+/-180	
12-20-83	<131	<17	8+/-6	0+/-7	1490+/-190	5.7+/-0.8

Eau Claire

1984

Isotope Collection date	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
01-10-84	0+/-13	5+/-5	9+/-6	7+/-7	1390+/-190	6.5+/-1.1
02-14-84	1+/-10	0+/-8	9+/-7	0+/-10	1360+/-190	4.3+/-0.7
03-13-84	2+/-5	-3+/-4	0+/-4	6+/-5	1400+/-130	5.4+/-0.8
04-10-84	2+/-7	0+/-5	0+/-6	3+/-7	1240+/-180	7.1+/-1.2
05-16-84	0+/-7	2+/-3	0+/-6	-1+/-6	1380+/-180	5.1+/-0.8
06-13-84	3+/-7	5+/-4	0+/-7	7+/-7	1470+/-190	10.4+/-1.3
07-10-84	-1+/-7	0+/-5	9+/-6	17+/-7	1400+/-180	6.5+/-0.7
08-15-84	-1+/-8	0+/-5	4+/-6	-1+/-7	1590+/-190	8.6+/-1.3
09-10-84	0+/-7	2+/-5	-1+/-6	5+/-6	1440+/-190	6.8+/-0.9
10-11-84	6+/-5	-5+/-4	2+/-3	3+/-4	1450+/-80	7.2+/-1.0
11-13-84	1+/-7	-4+/-7	11+/-5	-1+/-7	1490+/-190	6.8+/-1.3
12-11-84	8+/-6	4+/-5	8+/-4	-1+/-6	1530+/-180	6.6+/-1.1

\* a - Radioisotope was not specifically analyzed for.

\* b - Strontium-90 is analyzed for from a monthly composite.

\* c - Too many half-lives had passed for analysis.

Isotopes other than those reported were not detected.

Table 7. Analysis of milk samples for 1983 and 1984.  
Green Bay

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Green Bay 1983

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90 * b
Collection date						
01-17-83	0	3	* a	3	1300+/-200	
01-31-83	4.0	1.2	* a	-4.7	1350+/-80	4.6+/-0.9
02-14-83	2.7	2.4	* a	-3.0	1340+/-80	
02-28-83	2.0	7.2	* a	-2.5	1380+/-80	3.2+/-0.7
03-14-83	3.0	3.1	* a	-3.3	1260+/-80	
03-28-83	2.7	2.9	* a	-3.9	1330+/-80	4.3+/-0.8
04-11-83	2	-3	* a	5	1700+/-300	
04-25-83	4.1	1.3	* a	-3.9	1400+/-80	3.7+/-0.8
05-09-83	-0.5	3.2	* a	1.8	1290+/-80	
05-23-83	-4.0	5.3	* a	-3.9	1400+/-80	4.1+/-0.7
06-06-83	2.0	3.5	* a	-0.6	1620+/-90	
06-20-83	3.0	3.7	* a	-0.8	1600+/-90	5.3+/-0.8
07-05-83	-3+/-12	-1+/-8	-2+/-9	5+/-9	1220+/-190	
07-18-83	-3+/-12	1+/-8	3+/-9	-1+/-11	1370+/-190	4.7+/-1.2
08-01-83	4+/-11	1+/-8	2+/-9	4+/-11	1220+/-190	
08-15-83	0+/-12	6+/-7	0+/-8	0+/-11	1600+/-200	
08-29-83	-1+/-12	9+/-7	5+/-9	11+/-11	1500+/-200	5.1+/-1.0
09-12-83	* c	* c	2+/-10	1+/-12	1400+/-200	
09-26-83	1+/-7	5+/-4	10+/-6	11+/-6	1470+/-180	4.5+/-1.1
10-10-83	1+/-7	-2+/-6	-1+/-7	0+/-8	1370+/-190	
10-24-83	0+/-7	4+/-4	0+/-7	5+/-8	1470+/-190	3.3+/-0.9
11-07-83	3+/-6	7+/-5	0+/-6	3+/-7	1350+/-180	
11-21-83	0+/-7	-1+/-6	1+/-6	2+/-7	1500+/-180	3.4+/-0.9
12-05-83	0+/-7	9+/-5	0+/-7	5+/-7	1570+/-190	
12-19-83	0+/-6	0+/-6	0+/-7	1+/-6	1520+/-180	2.7+/-1.3

De Pere 1984

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
Collection date						
01-16-84	6+/-7	1+/-2	7+/-5	-2+/-8	1450+/-180	4.8+/-0.9
02-15-84	0+/-8	4+/-4	2+/-6	-4+/-8	1560+/-190	2.0+/-0.6
03-13-84	0+/-10	0+/-7	-1+/-9	-2+/-10	1400+/-200	2.9+/-0.6
04-09-84	3+/-7	3+/-4	2+/-7	2+/-7	1280+/-180	4.1+/-0.9
05-15-84	5+/-7	5+/-4	0+/-6	4+/-6	1520+/-190	4.1+/-1.1
06-12-84	0+/-8	8+/-5	0+/-7	6+/-7	1330+/-170	3.3+/-1.1
07-09-84	-1+/-7	2+/-5	7+/-5	-1+/-8	1520+/-190	2.8+/-0.7
08-13-84	-1+/-6	-2+/-4	-1+/-7	-1+/-7	1400+/-170	2.6+/-0.9
09-11-84	4+/-6	0+/-4	-1+/-6	-1+/-7	1390+/-170	2.8+/-0.7
10-08-84	2+/-6	3+/-5	3+/-6	2+/-7	1500+/-190	3.4+/-0.7
11-13-84	1+/-7	-3+/-7	-1+/-6	2+/-6	1380+/-180	3.4+/-0.7
12-10-84	3+/-6	0+/-4	7+/-6	2+/-7	1370+/-180	4.2+/-1.1

\* a - Radioisotope was not specifically analyzed for.

\* b - Strontium-90 is analyzed for from a monthly composite.

\* c - Too many half-lives had passed for analysis.

Isotopes other than those reported were not detected.

Table 8. Analysis of milk samples for 1983 and 1984.  
Madison

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Madison

1983

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90 * b
Collection date						
01-05-83	5.2	2.2	* a	-4.6	1430+/-80	
01-19-83	4.1	3.4	* a	3.6	1410+/-80	3.9+/-0.7
02-01-83	0.4	1.9	* a	-4.3	1440+/-80	
02-15-83	6.2	1.5	* a	2.5	1360+/-80	5.1+/-0.8
03-01-83	7.2	3.2	* a	4.6	1360+/-80	
03-16-83	0.6	4.2	* a	-1.7	1400+/-80	
03-29-83	0	5	* a	6	1290+/-190	4.8+/-0.8
04-13-83	-4	6	* a	8	1300+/-190	
04-26-83	1.2	4.3	* a	-3.5	1390+/-80	3.3+/-0.8
05-01-83	1.8	5.2	* a	0.0	1360+/-80	
05-24-83	3.8	6.5	* a	5.1	1210+/-80	5.8+/-0.8
06-08-83	1.6	5.9	* a	-2.4	1550+/-90	
06-21-83	0.3	5.6	* a	-0.5	1510+/-90	5.0+/-0.8
07-07-83	1+/-10	5+/-9	-4+/-10	-1+/-10	1390+/-200	
07-21-83	-1+/-11	7+/-7	3+/-9	0+/-11	1400+/-200	6.3+/-1.3
08-02-83	7+/-10	2+/-8	3+/-9	2+/-10	1230+/-190	
08-18-83	0+/-10	-3+/-9	0+/-9	0+/-11	1270+/-190	2.5+/-0.7
09-01-83	-1+/-10	7+/-6	0+/-9	11+/-10	1250+/-190	
09-13-83	* c	* c	0+/-9	3+/-8	1370+/-190	
09-28-83	0+/-7	2+/-3	4+/-7	0+/-7	1440+/-180	2.6+/-0.7
10-20-83	-1+/-6	1+/-6	0+/-7	3+/-7	1430+/-190	1.9+/-0.8
11-11-83	0+/-7	0+/-9	-1+/-6	1+/-7	1600+/-200	
11-23-83	0+/-7	6+/-4	1+/-7	3+/-8	1300+/-170	3.1+/-0.7
12-08-83	0+/-7	6+/-4	2+/-7	4+/-8	1570+/-190	
12-21-83	0+/-7	1+/-3	0+/-6	1+/-6	1600+/-190	2.4+/-0.6

Madison

1984

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
Collection date						
01-19-84	0+/-6	4+/-4	10+/-6	5+/-7	1300+/-170	1.6+/-0.8
02-15-84	0+/-7	4+/-4	4+/-7	-2+/-8	1430+/-180	2.0+/-0.7
03-14-84	12+/-8	6+/-4	5+/-8	-2+/-10	1350+/-190	2.1+/-0.7
04-12-84	3+/-6	2+/-4	4+/-5	-1+/-7	1370+/-180	2.5+/-0.6
05-17-84	5+/-6	5+/-4	8+/-6	10+/-7	1450+/-190	2.0+/-0.6
06-14-84	3+/-7	1+/-3	2+/-7	2+/-6	1410+/-180	3.2+/-1.3
07-12-84	-1+/-7	0+/-4	7+/-6	9+/-7	1600+/-200	2.2+/-0.6
08-14-84	6+/-6	1+/-4	4+/-6	7+/-6	1590+/-180	3.4+/-0.8
09-12-84	-1+/-6	3+/-5	-1+/-6	6+/-6	1350+/-170	3.5+/-0.8
10-09-84	-1+/-6	-1+/-3	7+/-4	1+/-6	1440+/-170	1.9+/-1.0
11-13-84	-1+/-6	3+/-5	7+/-6	11+/-6	1390+/-170	3.1+/-0.8
12-13-84	-1+/-6	-3+/-5	11+/-5	7+/-6	1470+/-180	1.9+/-0.6

\* a - Radioisotope was not specifically analyzed for.

\* b - Strontium-90 is analyzed for from a monthly composite.

\* c - Too many half-lives had passed for analysis.

Isotopes other than those reported were not detected.

Table 9. Analysis of milk samples for 1983 and 1984.  
Rice Lake

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Rice Lake 1983

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90 * b
Collection date						
01-17-83	4.9	1.0	* a	-1.8	1390+/-60	
01-31-83	0.6	5.2	* a	-2.1	1350+/-80	6.8+/-0.9
02-14-83	2.0	1.9	* a	3.4	1400+/-80	
02-28-83	2.0	2.6	* a	0.4	1340+/-80	5.3+/-0.8
03-15-83	-0.1	4.0	* a	-2.6	1340+/-80	
03-28-83	1.4	2.1	* a	2.5	1290+/-80	7.8+/-0.9
04-11-83	10	7	* a	7	1300+/-200	
04-25-83	1.4	8.1	* a	-1.3	1360+/-80	5.9+/-1.1
05-09-83	2.2	4.5	* a	0.8	1200+/-80	
05-23-83	-2.6	3.2	* a	-1.6	1350+/-80	8.4+/-1.7
06-06-83	0.2	3.5	* a	0.1	1500+/-90	
06-20-83	0.3	2.1	* a	0.8	1500+/-90	6.7+/-1.2
07-01-83	5+/-15	12+/-9	-1+/-8	9+/-9	1220+/-190	
07-18-83	-2+/-11	6+/-7	-1+/-8	3+/-10	1330+/-190	7.0+/-1.4
08-01-83	-4+/-10	1+/-8	6+/-9	5+/-11	1290+/-190	
08-15-83	4+/-12	-3+/-10	4+/-7	2+/-11	1500+/-200	
08-29-83	0+/-6	-1+/-9	3+/-9	16+/-9	1200+/-200	8.0+/-1.3
09-12-83	* c	* c	0+/-7	2+/-8	1500+/-200	
09-26-83	2+/-8	6+/-5	1+/-7	2+/-7	1390+/-190	8.2+/-1.1
10-10-83	-4+/-7	1+/-6	-8+/-8	1+/-8	1480+/-190	
10-20-83	4+/-7	0+/-6	-3+/-7	3+/-6	1600+/-200	6.1+/-1.1
November * d						
December * d						

Rice Lake 1984

Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
Collection date						
January * d						
02-14-84	0+/-9	1+/-6	2+/-4	1+/-6	1390+/-130	8.1+/-1.3
03-16-84	9+/-8	-1+/-4	2+/-6	-3+/-7	1230+/-180	6.7+/-0.9
04-09-84	3+/-7	-1+/-6	3+/-6	4+/-7	1380+/-150	4.2+/-1.0
05-14-84	3+/-7	5+/-5	0+/-7	-1+/-7	1420+/-190	7.4+/-1.1
06-11-84	1+/-7	3+/-3	0+/-8	-1+/-7	1410+/-180	9.2+/-1.6
07-09-84	-1+/-7	0+/-5	4+/-6	4+/-6	1310+/-180	5.6+/-0.7
08-13-84	-1+/-7	-1+/-4	1+/-6	6+/-6	1450+/-170	5.4+/-1.1
09-11-84	-1+/-7	2+/-5	1+/-6	5+/-6	1450+/-170	5.9+/-1.0
10-08-84	5+/-8	2+/-5	0+/-4	6+/-4	1280+/-120	6.4+/-1.1
11-12-84	4+/-6	0+/-4	3+/-6	12+/-6	1350+/-190	5.6+/-1.0
12-10-84	6+/-6	2+/-5	-1+/-7	3+/-7	1390+/-170	6.5+/-1.2

\* a - Radioisotope was not specifically analyzed for.

\* b - Strontium-90 is analyzed for from a monthly composite.

\* c - Too many half-lives had passed for analysis.

\* d - A milk sample was not collected for that month.

Isotopes other than those reported were not detected.

Table 10. Analysis of milk samples for 1983 and 1984.  
Wausau

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Wausau 1983

Isotope Collection date	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90 * b
01-03-83	6.6	1.7	* a	-0.1	1350+/-80	
01-17-83	4.8	4.7	* a	-2.3	1460+/-80	
01-31-83	4.0	10.0	* a	0.4	1260+/-80	4.8+/-0.8
02-14-83	2.1	0.8	* a	-0.5	1360+/-80	
02-28-83	12.2	4.4	* a	2.2	1280+/-80	5.8+/-0.9
03-14-83	-0.4	1.9	* a	-3.1	1360+/-80	
03-28-83	-2.1	3.2	* a	-1.9	1330+/-80	7.4+/-0.9
04-11-83	8	4	* a	6	1300+/-200	
04-26-83	3.9	0.7	* a	5.8	1230+/-80	6.1+/-0.9
05-09-83	2.4	0.7	* a	0.7	1390+/-80	
05-23-83	4.1	0.4	* a	-1.8	1260+/-80	6.4+/-1.0
06-06-83	0.3	5.4	* a	-1.7	1530+/-90	
06-20-83	2.5	2.3	* a	0.9	1530+/-90	6.8+/-0.9
07-18-83	2+/-11	-4+/-7	1+/-9	6+/-11	1400+/-190	7.7+/-1.1
08-01-83	2+/-13	-1+/-8	1+/-10	1+/-12	1500+/-200	
08-15-83	4+/-11	0+/-10	0+/-10	3+/-11	1530+/-190	
08-29-83	13+/-10	-3+/-8	5+/-8	12+/-10	1500+/-200	6.3+/-1.1
09-12-83	* c	* c	0+/-8	-2+/-8	1380+/-180	
09-26-83	0+/-9	1+/-3	3+/-6	1+/-8	1410+/-180	5.2+/-1.0
10-10-83	* c	* c	-1+/-6	7+/-8	1600+/-200	
10-24-83	-5+/-7	5+/-4	-3+/-6	-3+/-7	1500+/-190	4.7+/-1.0
11-07-83	4+/-7	6+/-5	0+/-7	3+/-8	1390+/-180	
11-22-83	3+/-10	0+/-9	0+/-8	-2+/-10	1500+/-200	4.9+/-1.0
12-05-83	1+/-8	5+/-4	0+/-7	0+/-8	1600+/-190	
12-19-83	0+/-8	9+/-5	0+/-7	1+/-8	1570+/-190	4.5+/-0.8

Wausau 1984

Isotope Collection date	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
01-09-84	10+/-7	2+/-3	0+/-7	2+/-7	1490+/-180	7+/-2
02-22-84	6+/-5	-2+/-4	7+/-4	9+/-5	1410+/-130	4.6+/-1.0
03-13-84	4+/-5	-3+/-4	1+/-5	2+/-5	1430+/-130	4.2+/-0.9
04-09-84	3+/-10	0+/-7	1+/-8	2+/-8	1340+/-190	4.8+/-0.9
05-14-84	-1+/-7	3+/-4	0+/-7	3+/-6	1470+/-180	4.5+/-0.9
06-12-84	3+/-7	9+/-5	3+/-7	10+/-7	1250+/-180	5.7+/-1.3
07-09-84	1+/-8	1+/-5	1+/-7	7+/-7	1450+/-190	5.5+/-1.0
08-20-84	1+/-7	-3+/-7	-1+/-8	-1+/-7	1420+/-170	5.4+/-0.8
September * d						
10-08-84	-1+/-7	-1+/-4	10+/-5	6+/-6	1450+/-170	4.5+/-0.8
11-13-84	8+/-7	1+/-4	4+/-7	9+/-6	1440+/-180	4.4+/-0.7
12-11-84	-1+/-7	1+/-4	5+/-6	4+/-6	1620+/-180	5.8+/-1.0

\* a - Radioisotope was not specifically analyzed for.

\* b - Strontium-90 is analyzed for from a monthly composite.

\* c - Too many half-lives had passed for analysis.

\* d - A milk sample was not collected for that month.

Isotopes other than those reported were not detected.

Table 11. Analysis of milk samples for 1984.  
Whitewater

WISCONSIN DIVISION OF HEALTH  
SECTION OF RADIATION PROTECTION

Measurements in units of pCi/liter

Whitewater 1984						
Isotope	I-131	Ba,La-140	Cs-134	Cs-137	K-40	Sr-90
Collection date						
January * a						
02-13-84	0+/-6	4+/-3	6+/-4	3+/-6	1460+/-140	2.5+/-0.7
March *a						
04-10-84	0+/-8	1+/-4	3+/-7	4+/-7	1290+/-170	3.9+/-1.1
05-15-84	4+/-8	4+/-4	7+/-5	8+/-7	1380+/-180	2.2+/-0.6
06-07-84	6+/-7	4+/-4	4+/-6	2+/-7	1350+/-180	3.4+/-0.7
07-09-84	6+/-7	1+/-5	0+/-6	4+/-6	1370+/-180	2.7+/-0.5
08-15-84	-1+/-11	8+/-5	6+/-8	-1+/-10	1230+/-190	3.2+/-0.6
09-11-84	1+/-7	1+/-5	-1+/-6	-1+/-6	1440+/-170	2.7+/-0.7
10-10-84	-1+/-7	3+/-5	5+/-5	-1+/-6	1460+/-180	4.2+/-1.2
11-12-84	-1+/-7	0+/-4	3+/-5	2+/-6	1340+/-170	2.3+/-0.9
12-10-84	-1+/-7	4+/-5	1+/-7	3+/-7	1560+/-180	3.5+/-1.1

\* a - A milk sample was not collected for that month.

Isotopes other than those reported were not detected.





## State of Wisconsin

DIVISION OF HEALTH

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August 23, 1985

James Keppler  
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Region III  
799 Roosevelt Road  
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PRIORITY ROUTING	
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Enclosed is a copy of the latest Milk Monitoring Network report covering the period from 1983 through 1984. If you have any questions or require additional copies, please contact us.

Sincerely,

Lawrence J. McDonnell, Chief

Lawrence J. McDonnell, Chief  
Section of Radiation Protection

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Enclosure

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