

**PUE “INSTITUTE OF RADIATION SAFETY “BELRAD”**

APPROVED

Director of PUE “Institute of Radiation  
Safety “Belrad”

\_\_\_\_\_ A.V. Nesterenko

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**SHORT REPORT**

**UNDER THE CONTRACT No. 36 (ATLAS-2) DATED TO JUNE 25, 2008  
(STAGES 13 AND 14)**

Deputy director  
for international cooperation

\_\_\_\_\_ V.I. Babenko

« \_\_\_\_ » \_\_\_\_\_ 20\_\_

**MINSK**

**2010**

According to the Contract No. 36 dated to June 25, 2008 following actions given in the table 1 were performed in framework of the stages 13 and 14.

Table 1 – Data on the number of measurements and the quantity of the preparation VITAPECT given in framework of the stages 13 and 14 to the Contract No. 36.

Settlement	Date	Number of measurements			Quantity of VITAPECT		Notes
		expected	all	children	expected	actual	
Dyatlovichi secondary school and kindergarten of Luninets district of Brest region	22-25.09.2009	510	461	432	1020	-	
	15.02.2010	-	-	-	-	1020	
	20-22.04.2010	510	470	437	-	-	
Liplyany secondary school and kindergarten of Lechitsy district of Gomel region	18.09.2009	110	132	117	220	-	
	22.10.2009	-	116	106	-	-	Control measurement
	16.02.2010	-	-	-	-	220	
	25.03.2010	110	126	120	-	-	
Miloshevichi secondary school and kindergarten of Lechitsy district of Gomel region	10.09.2009	130	168	153	260	-	
	16.02.2010	-	-	-	-	260	
	19.03.2010	130	170	155	-	-	
<b>TOTAL:</b>		<b>1500</b>	<b>1643</b>	<b>1520</b>	<b>1500</b>	<b>1500</b>	

Hereafter there is a statistical data processing.

## DYATLOVICH I

Characteristics	Value	Source
<sup>137</sup> Cs contamination density of the territory	2.12 Ci/km <sup>2</sup>	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Number of inhabitants	2374 persons	Borovoye village council, dated to September 22, 2009
External dose	0.25 mSv/a	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Internal dose	0.70 mSv/a	-----«-----
Cumulative dose	0.95 mSv/a	-----«-----

According to the data dated to September 2009 in the Dyatlovichi secondary school there are 420 children, 62 teachers and 19 persons of other staff; in the kindergarten “Verasok” there are 90 children and 31 persons of other staff.

Children from following settlements go to the Dyatlovichi secondary school and kindergarten: Dyatlovichi, Kupovtsy and Borovtsy.

## September 22-25, 2009

The first measurement of children in the Dyatlovichi secondary school and kindergarten of Luninets district of Brest region was performed in the school building. A total of measured persons was 461 persons (432 children and 29 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 432):  $(24.9 \pm 0.4)$  Bq/kg.

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 30):  $(42.3 \pm 1.2)$  Bq/kg.

Median value in the whole group: 24.0 Bq/kg.

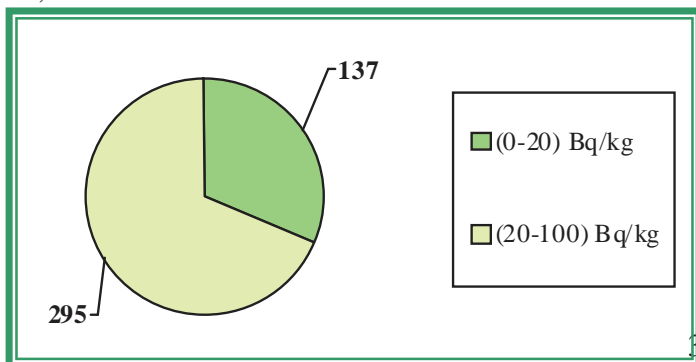
Median value in the critical group: 40.5 Bq/kg.

The table 2 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements performed from September 22, 2009 to September 25, 2009.

Table 2

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	Sh.V.P.	SCHOOLBOY	M	21	2002	64.3
2.	Z.V.V.	SCHOOLBOY	M	39	1996	59.4
3.	Sh.V.P.	SCHOOLBOY	M	54	1994	52.5
4.	R.D.M.	SCHOOLBOY	M	55	1995	50.2
5.	K.R.A.	SCHOOLBOY	M	50	1997	48.0
6.	K.D.A.	SCHOOLBOY	M	27	2001	47.0
7.	Sh.M.S.	SCHOOLBOY	M	67	1993	46.9
8.	K.Ya.S.	SCHOOLGIRL	F	36	2001	45.0
9.	Z.V.N.	SCHOOLGIRL	F	31	1999	42.0
10.	Sh.V.S.	SCHOOLBOY	M	52	1996	41.5
11.	Z.A.V.	SCHOOLBOY	M	36	1999	41.4
12.	K.Ya.V.	SCHOOLGIRL	F	28	1999	41.2
13.	S.V.V.	SCHOOLBOY	M	34	1998	40.9
14.	K.N.V.	CHILD PRESCHOOL AGE	M	19	2004	40.9
15.	K.N.V.	SCHOOLGIRL	F	41	1995	40.9
16.	Sh.V.P.	SCHOOLBOY	M	21	2002	64.3
17.	Z.V.V.	SCHOOLBOY	M	39	1996	59.4
18.	Sh.V.P.	SCHOOLBOY	M	54	1994	52.5
19.	R.D.M.	SCHOOLBOY	M	55	1995	50.2
20.	K.R.A.	SCHOOLBOY	M	50	1997	48.0
21.	K.D.A.	SCHOOLBOY	M	27	2001	47.0
22.	Sh.M.S.	SCHOOLBOY	M	67	1993	46.9
23.	K.Ya.S.	SCHOOLGIRL	F	36	2001	45.0
24.	Z.V.N.	SCHOOLGIRL	F	31	1999	42.0
25.	Sh.V.S.	SCHOOLBOY	M	52	1996	41.5
26.	Z.A.V.	SCHOOLBOY	M	36	1999	41.4
27.	K.Ya.V.	SCHOOLGIRL	F	28	1999	41.2
28.	S.V.V.	SCHOOLBOY	M	34	1998	40.9
29.	K.N.V.	CHILD PRESCHOOL AGE	M	19	2004	40.9
30.	K.N.V.	SCHOOLGIRL	F	41	1995	40.9

The figure 1 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the results of measurements performed from September 22, 2009 to September 25, 2009.



←Figure 1 - Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the results of measurements performed from September 22, 2009 to September 25, 2009.

On February 15, 2010 1020 packings of the pectin preparation VITAPECT were given for children.

### April 20-22, 2010

The second measurement of children in the Dyatlovichi secondary school and kindergarten of Luninets district of Brest region was performed in the school building. A total of measured persons was 470 persons (437 children and 33 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 437):  $(17.9 \pm 0.4) \text{ Bq/kg.}$

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 30):  $(35.7 \pm 1.9) \text{ Bq/kg.}$

Median value in the whole group:  $16.9 \text{ Bq/kg.}$

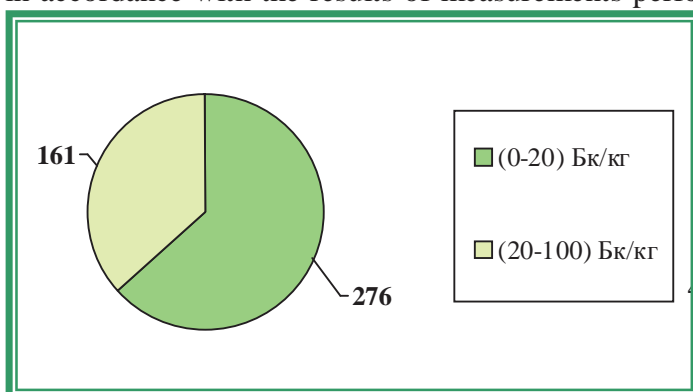
Median value in the critical group:  $32.3 \text{ Bq/kg.}$

The table 3 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements performed from September 22, 2009 to September 25, 2009.

Table 3

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	K.I.M.	SCHOOLBOY	M	49	1996	68.4
2.	G.A.Yu.	SCHOOLBOY	M	42	1998	68.4
3.	Ch.A.V.	SCHOOLGIRL	F	49	1998	56.3
4.	Ch.N.E.	SCHOOLBOY	M	33	2000	46.5
5.	K.A.A.	SCHOOLGIRL	F	24	2000	36.5
6.	K.V.V.	SCHOOLBOY	M	26	2001	36.3
7.	B.V.V.	SCHOOLGIRL	F	49	1997	35.9
8.	K.A.M.	SCHOOLBOY	M	34	2001	34.5
9.	K.N.V.	CHILD PRESCHOOL AGE	M	20	2004	33.3
10.	K.M.A.	SCHOOLBOY	M	30	1998	33.2
11.	F.A.V.	SCHOOLGIRL	F	32	2000	33.0
12.	F.D.O.	SCHOOLGIRL	F	20	2003	32.7
13.	G.T.M.	SCHOOLGIRL	F	30	2000	32.6
14.	Sh.V.E.	SCHOOLGIRL	F	34	2000	32.5
15.	K.Yu.A.	SCHOOLBOY	M	25	1999	32.4
16.	B.V.V.	SCHOOLGIRL	F	53	1995	32.2
17.	K.D.A.	SCHOOLGIRL	F	19	2003	31.7
18.	Ch.I.V.	SCHOOLGIRL	F	28	1999	31.7
19.	K.D.V.	SCHOOLBOY	M	26	2002	31.6
20.	H.Yu.V.	SCHOOLGIRL	F	24	2000	31.5
21.	Sh.K.D.	SCHOOLGIRL	F	31	2000	31.3
22.	Sh.S.A.	SCHOOLBOY	M	47	1999	30.3
23.	S.A.V.	SCHOOLBOY	M	33	1998	30.3
24.	H.N.V.	SCHOOLGIRL	F	30	2003	30.1
25.	K.S.S.	SCHOOLGIRL	F	30	2001	30.1
26.	G.Ya.S.	SCHOOLGIRL	F	25	2002	30.0
27.	K.D.N.	SCHOOLGIRL	F	27	2001	29.9
28.	B.B.G.	SCHOOLBOY	M	38	1998	29.7
29.	N.A.P.	SCHOOLBOY	M	38	1997	29.7
30.	K.A.A.	SCHOOLBOY	M	42	1999	29.6

The figure 2 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the results of measurements performed from September 20, 2010 to September 22, 2010.



←Figure 2 - Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the

results of measurements performed from September 20, 2010 to September 22, 2010.

To demonstrate the efficiency of the effects of pectin preparations there are comparative data on interval distribution of the specific activity of  $^{137}\text{Cs}$  in children having taken VITAPECT and having passed two WBC measurements (from September 22, 2009 to September 25, 2009 and from April 20, 2010 to April 22, 2010). This group consists of 364 children.

### September 22-25, 2009 April 20-22, 2010

The first measurement of children in the Dyatlovichi secondary school and kindergarten of Luninets district of Brest region was performed in the school building. A total of measured persons was 461 persons (432 children and 29 adults).

The second measurement of children in the Dyatlovichi secondary school and kindergarten of Luninets district of Brest region was performed in the school building. A total of measured persons was 470 persons (437 children and 33 adults).

The data of statistical processing of the results of measurements of the group of children having passed two WBC measurements and having taken VITAPECT-T (364 children).

Average specific activity of  $^{137}\text{Cs}$ :

after the first measurement:  $(24.9 \pm 0.4)$  Bq/kg,

after the second measurement:  $(17.4 \pm 0.4)$  Bq/kg.

Decrease of average specific activity of  $^{137}\text{Cs}$  was 30%.

Increase of specific activity: in 16% children.

The same level of specific activity: in 12% children.

Reduction of specific activity: in 72% children.

The evaluation of the scientific significance according to T-Student criterion ( $n = 364$ ):  $t=17.37$ . The received criterion  $t > 1.96$ ;  $p < 0.01$ .

Median value after the first measurement: 24.3 Bq/kg.

Median value after the second measurement: 16.3 Bq/kg.

Decrease of median value of specific activity of  $^{137}\text{Cs}$  was 33%.

The figure 3 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the results of measurements performed from September 22, 2009 to September 25, 2009 and from September 20, 2010 to September 22, 2010.

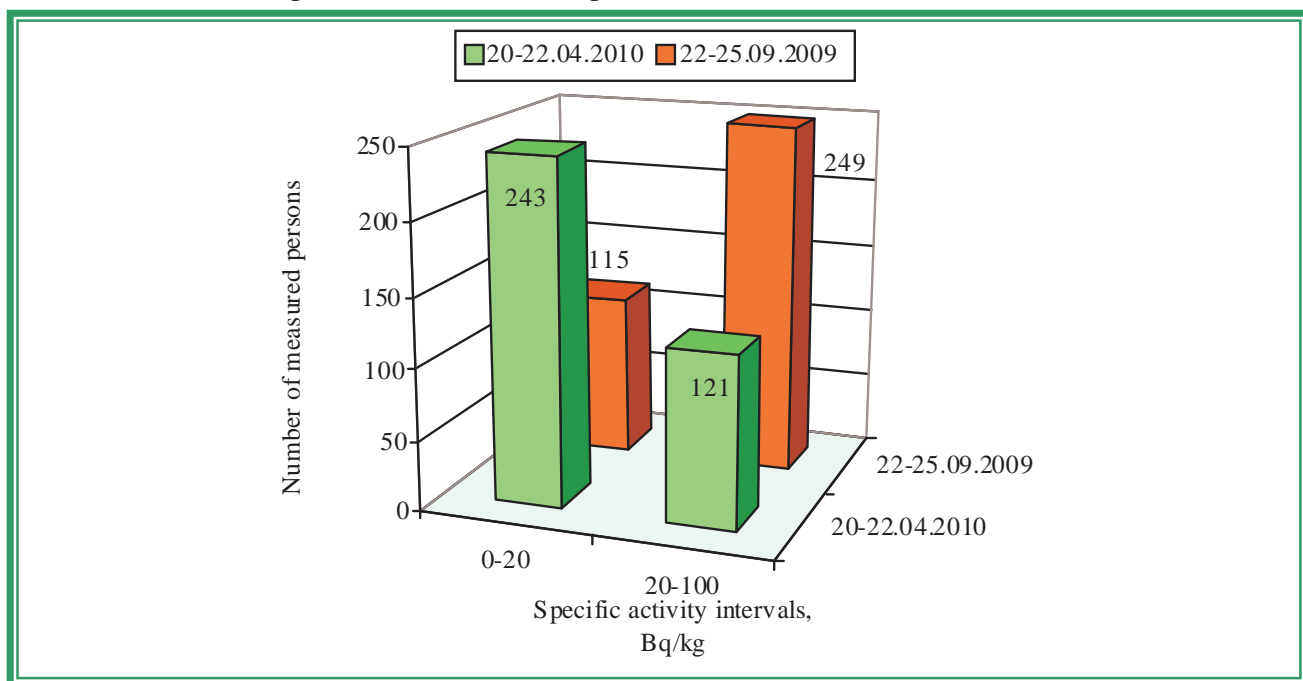


Figure 3 - Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Dyatlovichi secondary school and kindergarten of Luninets district of Gomel region in accordance with the results of measurements performed from September 22, 2009 to September 25, 2009 and from September 20, 2010 to September 22, 2010

<b>LIPLYANY</b>		
Characteristics	Value	Source
$^{137}\text{Cs}$ contamination density of the territory	1.78 Ci/km <sup>2</sup>	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Number of inhabitants	606 persons	Lelchitsy village council, dated to October, 2009
External dose	0.21 mSv/a	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Internal dose	0.40 mSv/a	-----«-----
Cumulative dose	0.61 mSv/a	-----«-----

According to the data dated to September 2009 in the Lipliany secondary school there are 127 children, 24 teachers and 11 persons of other staff; in the kindergarten there are 38 children and 11 persons of other staff.

Children from following settlements go to the Lipliany secondary school and kindergarten: Lipliany, Pobednoye and Buda-Lelchitskaya.

### September 18, 2009

The first measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 132 persons (117 children and 15 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 117):  $(31.6 \pm 1.0)$  Bq/kg.

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 15):  $(49.6 \pm 1.6)$  Bq/kg.

Median value in the whole group: 31.2 Bq/kg.

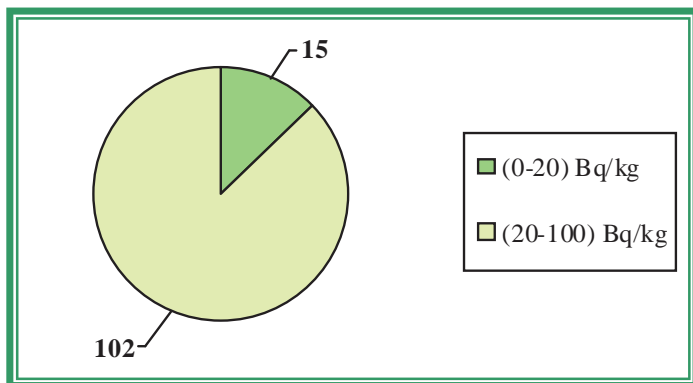
Median value in the critical group: 46.9 Bq/kg.

The table 4 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements dated to September 18, 2009.

Table 4

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	K.M.V.	CHILD PRESCHOOL AGE	M	18	2003	62.3
2.	L.K.A.	CHILD PRESCHOOL AGE	M	15	2006	59.7
3.	Yu.P.V.	CHILD PRESCHOOL AGE	F	16	2005	58.3
4.	Z.I.M.	SCHOOLGIRL	F	62	1994	53.9
5.	P.K.A.	CHILD PRESCHOOL AGE	F	19	2006	50.1
6.	N.V.A.	CHILD PRESCHOOL AGE	F	13	2005	49.5
7.	L.A.A.	CHILD PRESCHOOL AGE	F	20	2005	49.0
8.	Yu.V.Yu.	SCHOOLBOY	M	64	1992	46.9
9.	Yu.E.V.	SCHOOLBOY	M	35	2000	46.3
10.	G.Ya.V.	CHILD PRESCHOOL AGE	F	19	2004	45.6
11.	H.A.I.	SCHOOLBOY	M	30	2001	45.0
12.	Ch.M.V.	SCHOOLGIRL	F	49	1996	45.0
13.	F.M.S.	SCHOOLBOY	M	30	1999	44.7
14.	B.A.V.	CHILD PRESCHOOL AGE	M	19	2004	44.0
15.	D.V.V.	SCHOOLBOY	M	64	1994	44.0

The figure 4 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Liplany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 18, 2009.



←Figure 4 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Liplany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 18, 2009

### October 22, 2009

The control measurement of children in the Liplany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 116 persons (106 children and 10 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 106):  $(23.8 \pm 1.3)$  Bq/kg.

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 15):  $(47.2 \pm 5.8)$  Bq/kg.

Median value in the whole group: 20.5 Bq/kg.

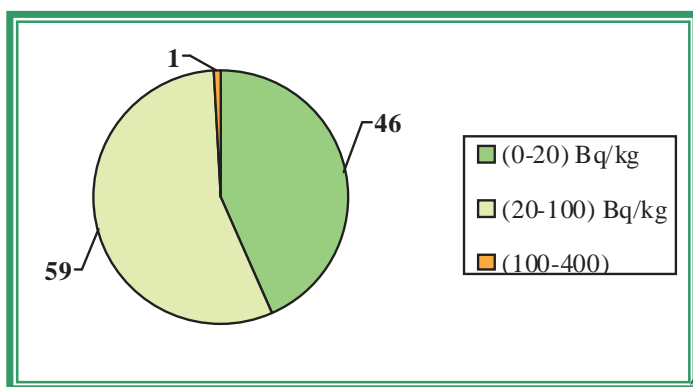
Median value in the critical group: 38.4 Bq/kg.

The table 5 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements dated to October 22, 2009.

Table 5

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	K.M.V.	CHILD PRESCHOOL AGE	M	18	2003	116.6
2.	B.F.A.	SCHOOLGIRL	F	29	2002	70.4
3.	O.D.A.	SCHOOLBOY	M	27	2002	62.6
4.	B.N.A.	CHILD PRESCHOOL AGE	M	22	2004	51.6
5.	B.N.A.	SCHOOLGIRL	F	27	2002	46.7
6.	F.V.V.	SCHOOLBOY	M	58	1995	44.5
7.	Yu.P.V.	CHILD PRESCHOOL AGE	F	16	2005	38.9
8.	L.Ya.A.	SCHOOLGIRL	F	24	2001	38.4
9.	Yu.E.Yu.	SCHOOLGIRL	F	21	2001	36.8
10.	L.F.A.	CHILD PRESCHOOL AGE	F	22	2003	35.8
11.	H.P.I.	SCHOOLBOY	M	43	1995	34.8
12.	S.D.A.	CHILD PRESCHOOL AGE	F	23	2003	33.8
13.	L.K.A.	CHILD PRESCHOOL AGE	M	16	2006	32.8
14.	Ch.M.V.	SCHOOLGIRL	F	52	1996	32.7
15.	B.K.I.	SCHOOLBOY	M	28	2000	32.1

The figure 5 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Liplany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to October 22, 2009.



←Figure 5 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Liplany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to October 22, 2009

Hereafter there are the dynamics of interval distribution of the specific activity of  $^{137}\text{Cs}$  in children having passed two WBC measurements (first and control) (on September 18, 2010 and October 22, 2009).

**September 18, 2009**  
**October 22, 2009**

The first measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 132 persons (117 children and 15 adults).

The control measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 116 persons (106 children and 10 adults).

The data of statistical processing of the results of measurements of the group of children having passed two WBC measurements (72 children).

Average specific activity of  $^{137}\text{Cs}$ :

after the first measurement:  $(32.2 \pm 1.3)$  Bq/kg,

after the second measurement:  $(25.7 \pm 1.8)$  Bq/kg.

Decrease of average specific activity of  $^{137}\text{Cs}$  was 20%.

Increase of specific activity: in 22% children.

The same level of specific activity: in 12% children.

Reduction of specific activity: in 66% children.

The evaluation of the scientific significance according to T-Student criterion ( $n = 72$ ):  $t=4.11$ . The received criterion  $t > 1.96$ ;  $p < 0.01$ .

Median value after the first measurement: 32.0 Bq/kg.

Median value after the second measurement: 22.0 Bq/kg.

Decrease of median value of specific activity of  $^{137}\text{Cs}$  was 31%.

The figure 6 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 18, 2010 and October 22, 2009.

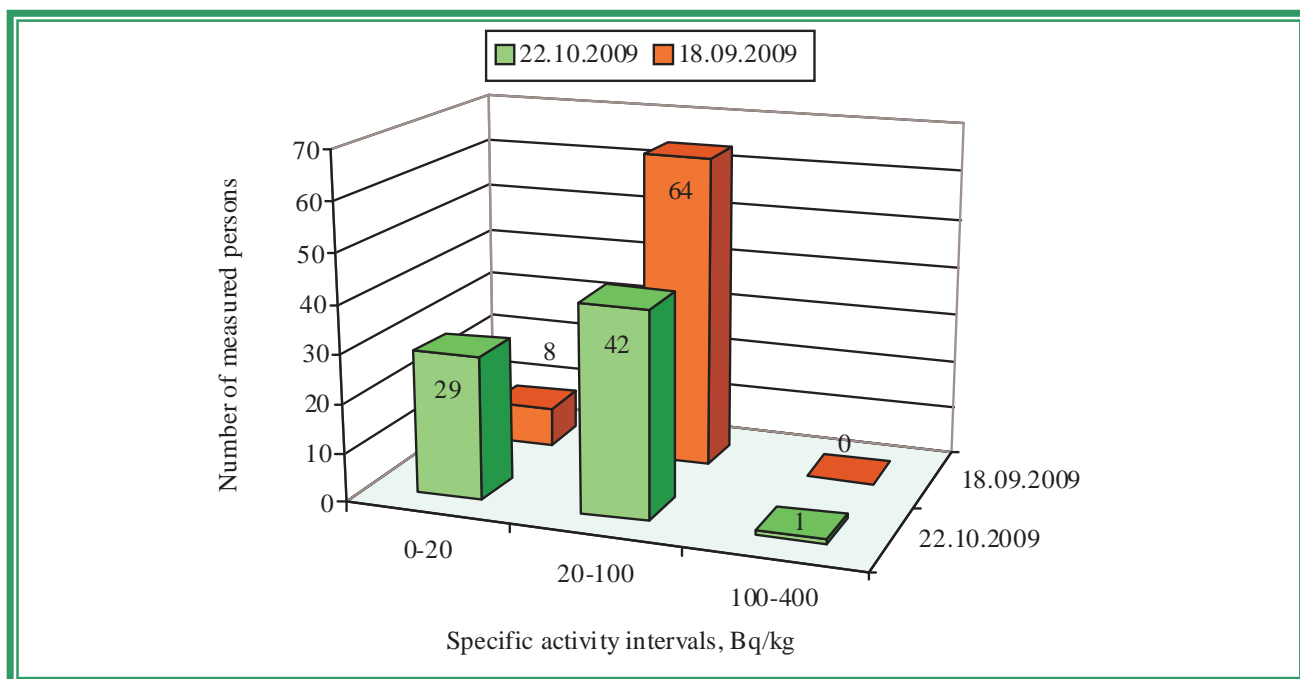


Figure 6 - Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 18, 2010 and October 22, 2009



On February 16, 2010 220 packings of the pectin preparation VITAPECT were given for children.

### March 25, 2010

The second measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 126 persons (120 children and 6 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 126):  $(24.0 \pm 0.8) \text{ Bq/kg}$ .

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 15):  $(41.8 \pm 1.8) \text{ Bq/kg}$ .

Median value in the whole group: 22.4 Bq/kg.

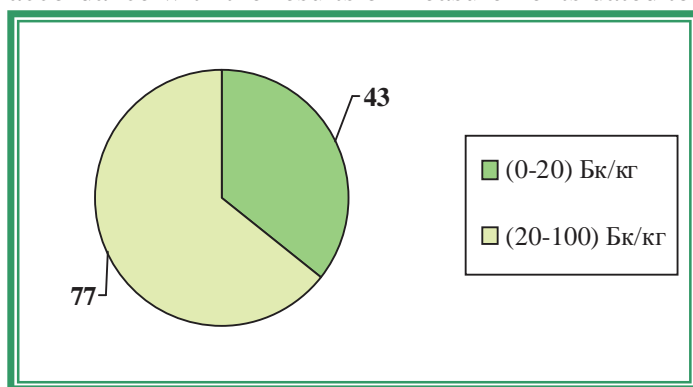
Median value in the critical group: 40.9 Bq/kg.

The table 6 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements dated to March 25, 2010.

Table 6

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	L.K.A.	CHILD PRESCHOOL AGE	M	16	2006	53.9
2.	O.M.A.	CHILD PRESCHOOL AGE	F	14	2006	53.4
3.	Yu.P.V.	CHILD PRESCHOOL AGE	F	16	2005	48.1
4.	K.S.S.	CHILD PRESCHOOL AGE	M	16	2005	44.9
5.	Ch.K.A.	CHILD PRESCHOOL AGE	F	18	2006	42.8
6.	P.K.A.	CHILD PRESCHOOL AGE	F	16	2006	42.6
7.	M.V.A.	CHILD PRESCHOOL AGE	M	19	2006	42.1
8.	K.M.V.	SCHOOLGIRL	F	17	2003	40.9
9.	K.S.N.	CHILD PRESCHOOL AGE	M	21	2007	40.0
10.	H.D.I.	CHILD PRESCHOOL AGE	F	17	2006	37.9
11.	H.A.I.	SCHOOLBOY	M	27	2001	37.3
12.	B.A.D.	CHILD PRESCHOOL AGE	F	16	2008	36.8
13.	P.D.S.	CHILD PRESCHOOL AGE	M	15	2005	36.5
14.	L.I.A.	CHILD PRESCHOOL AGE	M	16	2006	35.6
15.	P.V.A.	CHILD PRESCHOOL AGE	M	19	2007	35.1

The figure 7 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to March 25, 2010.



← Figure 7 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to March 25, 2010

To demonstrate the efficiency of the effects of pectin preparations there are comparative data on interval distribution of the specific activity of  $^{137}\text{Cs}$  in children having taken VITAPECT and having passed two WBC measurements (on October 22, 2009 and March 25, 2010). This group consists of 86 children.

### October 22, 2009

### March 25, 2010

The first measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 116 persons (106 children and 10 adults).

The second measurement of children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 126 persons (120 children and 6 adults).

The data of statistical processing of the results of measurements of the group of children having passed two WBC measurements and having taken VITAPECT-T (86 children).

Average specific activity of  $^{137}\text{Cs}$ :

after the first measurement:  $(22.4 \pm 1.0)$  Bq/kg,

after the second measurement:  $(22.2 \pm 0.8)$  Bq/kg.

Decrease of average specific activity of  $^{137}\text{Cs}$  was 1%.

Increase of specific activity: in 45% children.

The same level of specific activity: in 20% children.

Reduction of specific activity: in 35% children.

The evaluation of the scientific significance according to T-Student criterion ( $n = 86$ ):  $t=0.20$ . The received criterion  $t < 1.96$ ;  $p > 0.01$ .

Median value after the first measurement: 20.4 Bq/kg.

Median value after the second measurement: 21.2 Bq/kg.

Increase of median value of specific activity of  $^{137}\text{Cs}$  was 4%.

The figure 8 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to October 22, 2009 and March 25, 2010.

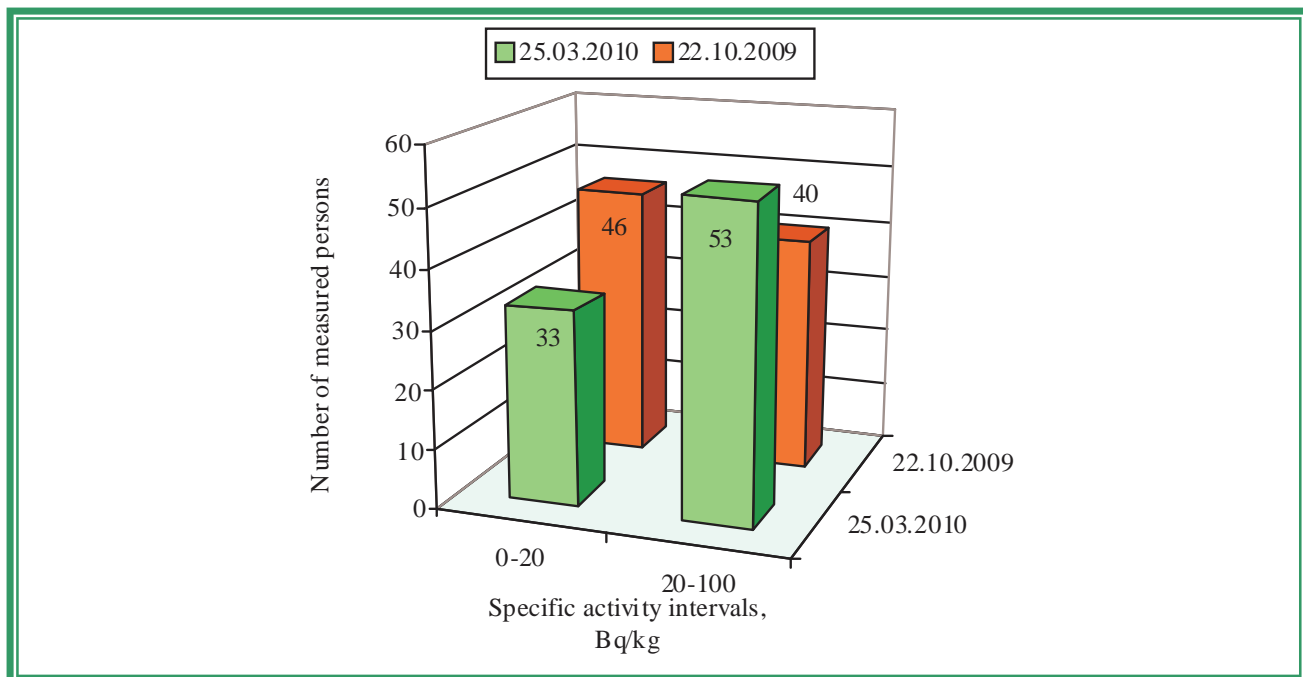


Figure 8 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Lipliany secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to October 22, 2009 and March 25, 2010

## MILOSHEVICH I

Characteristics	Value	Source
$^{137}\text{Cs}$ contamination density of the territory	0.96 Ci/km <sup>2</sup>	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Number of inhabitants	1049 persons	Lelchitsy village council, dated to

		October, 2009
External dose	0.11 mSv/a	Dose catalogue of the Ministry for Public Health Services of the Republic of Belarus, 2004
Internal dose	0.60 mSv/a	-----<-----
Cumulative dose	0.71 mSv/a	-----<-----

According to the data dated to September 2009 in the Miloshevichi secondary school there are 172 children, 30 teachers and 15 persons of other staff; in the kindergarten there are 39 children and 18 persons of other staff.

## September 10, 2009

The first measurement of children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 168 persons (153 children and 15 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 153):  $(28.3 \pm 0.6)$  Bq/kg.

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 15):  $(41.5 \pm 0.8)$  Bq/kg.

Median value in the whole group: 29.3 Bq/kg.

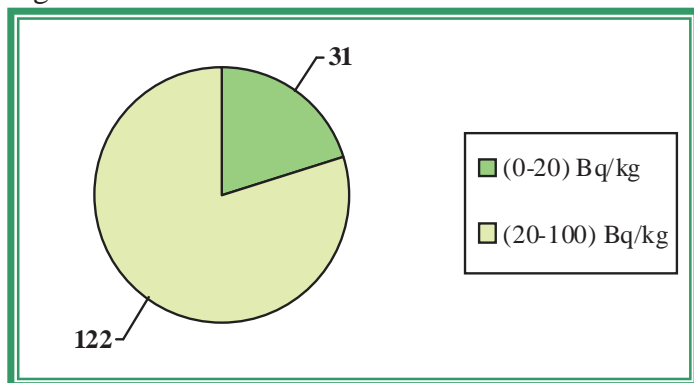
Median value in the critical group: 40.1 Bq/kg.

The table 7 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements dated to September 10, 2009.

Table 7

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	L.M.A.	SCHOOLBOY	M	68	1993	48.2
2.	N.D.Yu.	SCHOOLBOY	M	34	1996	46.8
3.	N.E.Yu.	SCHOOLBOY	M	22	2001	44.2
4.	G.E.A.	CHILD PRESCHOOL AGE	M	17	2003	44.0
5.	L.S.A.	SCHOOLBOY	M	41	1993	41.6
6.	A.I.I.	SCHOOLBOY	M	29	2000	41.0
7.	A.I.V.	SCHOOLBOY	M	31	2001	40.8
8.	A.I.N.	SCHOOLGIRL	F	63	1995	40.1
9.	L.V.A.	CHILD PRESCHOOL AGE	M	20	2003	40.0
10.	G.A.P.	SCHOOLGIRL	F	22	2001	39.5
11.	G.M.A.	SCHOOLGIRL	F	42	1995	39.5
12.	G.M.G.	SCHOOLBOY	M	74	1992	39.5
13.	G.A.N.	SCHOOLBOY	M	60	1993	39.3
14.	L.V.A.	SCHOOLGIRL	F	25	2000	39.2
15.	A.D.N.	SCHOOLBOY	M	56	1996	38.9

The figure 9 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 10, 2009.



←Figure 9 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 10, 2009

On February 16, 2010 260 packings of the pectin preparation VITAPECT were given for children.

## March 19, 2010

The second measurement of children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 170 persons (155 children and 15 adults).

Average  $^{137}\text{Cs}$  specific activity in the whole group (n = 155): (21.1 ± 0.7) Bq/kg.

Average  $^{137}\text{Cs}$  specific activity in the critical group (n = 15): (39.8 ± 4.1) Bq/kg.

Median value in the whole group: 20.0 Bq/kg.

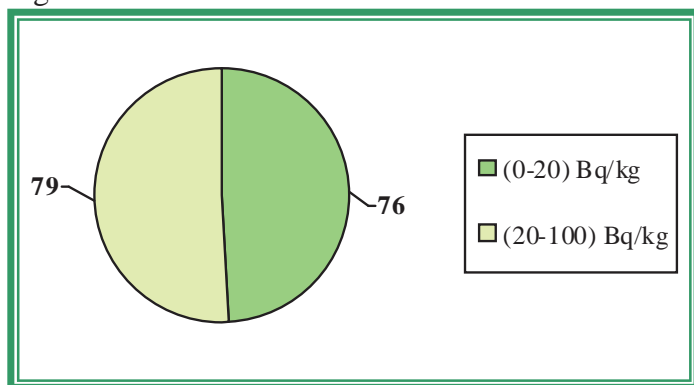
Median value in the critical group: 31.0 Bq/kg.

The table 8 demonstrates the maximal levels of  $^{137}\text{Cs}$  specific activity (the critical group) according to the results of measurements dated to March 19, 2010.

Table 8

No.	Surname Name Patronymic	Occupation	Sex	Weight, kg	Year of birth	Sp. activity, Bq/kg
1.	L.V.V.	SCHOOLBOY	M	38	1998	84,5
2.	L.N.V.	SCHOOLGIRL	F	31	1996	58,0
3.	L.V.N.	SCHOOLBOY	M	25	2001	56,7
4.	T.S.A.	SCHOOLBOY	M	53	1995	48,4
5.	B.V.V.	SCHOOLBOY	M	69	1996	42,0
6.	L.S.V.	SCHOOLGIRL	F	24	2002	34,8
7.	B.A.I.	SCHOOLGIRL	F	53	1995	31,8
8.	A.N.P.	SCHOOLBOY	M	32	1998	31,0
9.	G.M.N.	SCHOOLBOY	M	35	1999	31,0
10.	A.D.N.	SCHOOLBOY	M	64	1996	30,6
11.	L.M.V.	SCHOOLGIRL	F	37	1999	30,6
12.	L.P.V.	SCHOOLBOY	M	47	1997	30,2
13.	G.M.I.	SCHOOLGIRL	F	33	2000	29,8
14.	B.V.V.	SCHOOLBOY	M	31	2001	29,1
15.	T.G.A.	SCHOOLBOY	M	26	1999	28,9

The figure 10 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to March 19, 2010.



←Figure 10 – Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to March 19, 2010.

To demonstrate the efficiency of the effects of pectin preparations there are comparative data on interval distribution of the specific activity of  $^{137}\text{Cs}$  in children having taken VITAPECT and having passed two WBC measurements (on September 10, 2009 and March 19, 2010). This group consists of 135 children.

## September 10, 2009

## March 19, 2010

The first measurement of children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 168 persons (153 children and 15 adults).

The second measurement of children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region was performed in the school building. A total of measured persons was 170 persons (155 children and 15 adults).

The data of statistical processing of the results of measurements of the group of children having passed two WBC measurements and having taken VITAPECT-T (135 children).

Average specific activity of  $^{137}\text{Cs}$ :

after the first measurement:  $(28.5 \pm 0.7)$  Bq/kg,

after the second measurement:  $(20.7 \pm 0.7)$  Bq/kg.

Decrease of average specific activity of  $^{137}\text{Cs}$  was 27%.

Increase of specific activity: in 13% children.

The same level of specific activity: in 13% children.

Reduction of specific activity: in 74% children.

The evaluation of the scientific significance according to T-Student criterion ( $n = 135$ ):  $t=11.34$ . The received criterion  $> 1,96$ ;  $p < 0,01$ .

Median value after the first measurement: 29.3 Bq/kg.

Median value after the second measurement: 20.0 Bq/kg.

Decrease of median value of specific activity of  $^{137}\text{Cs}$  was 33%.

The figure 11 contains the diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 10, 2009 and March 19, 2010.

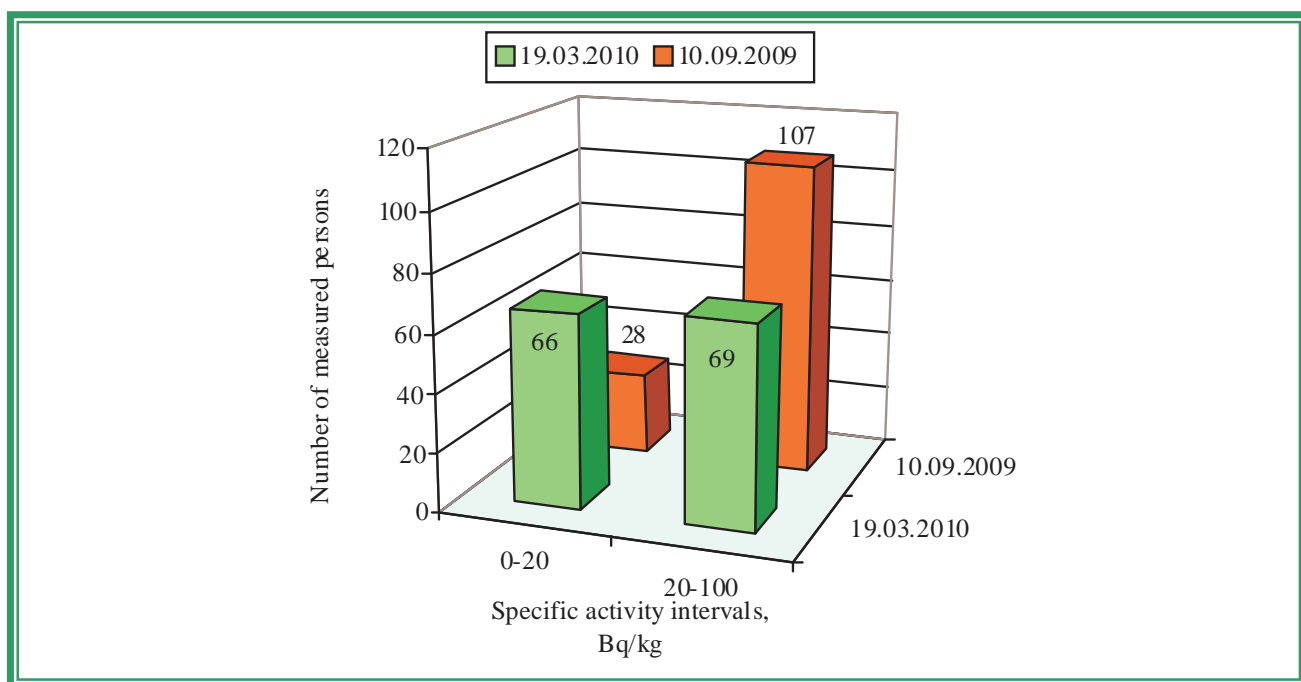


Figure 11 - Diagram of the interval  $^{137}\text{Cs}$  specific activity distribution in children in the Miloshevichi secondary school and kindergarten of Lelchitsy district of Gomel region in accordance with the results of measurements dated to September 10, 2009 and March 19, 2010

Senior engineer

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