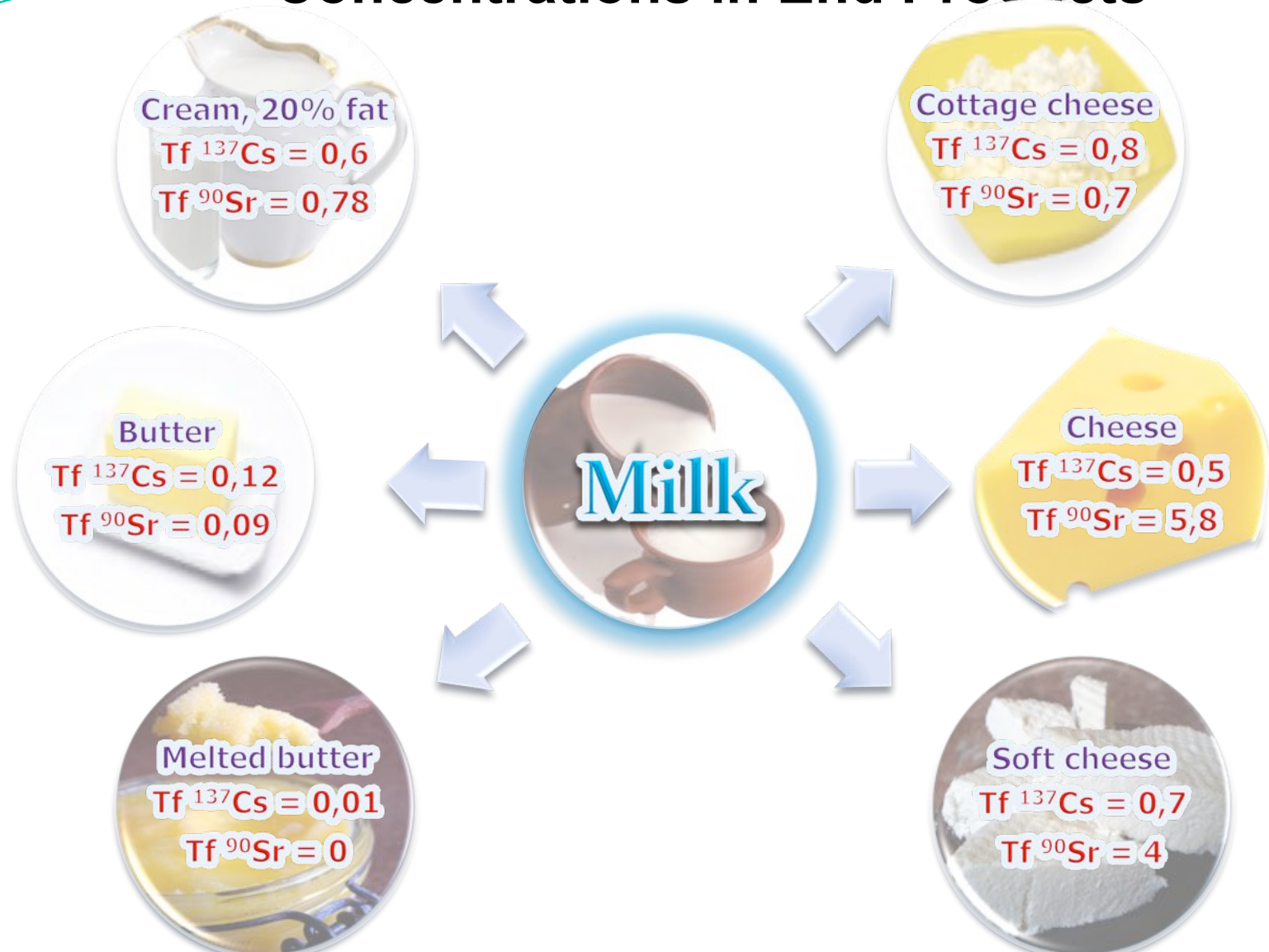




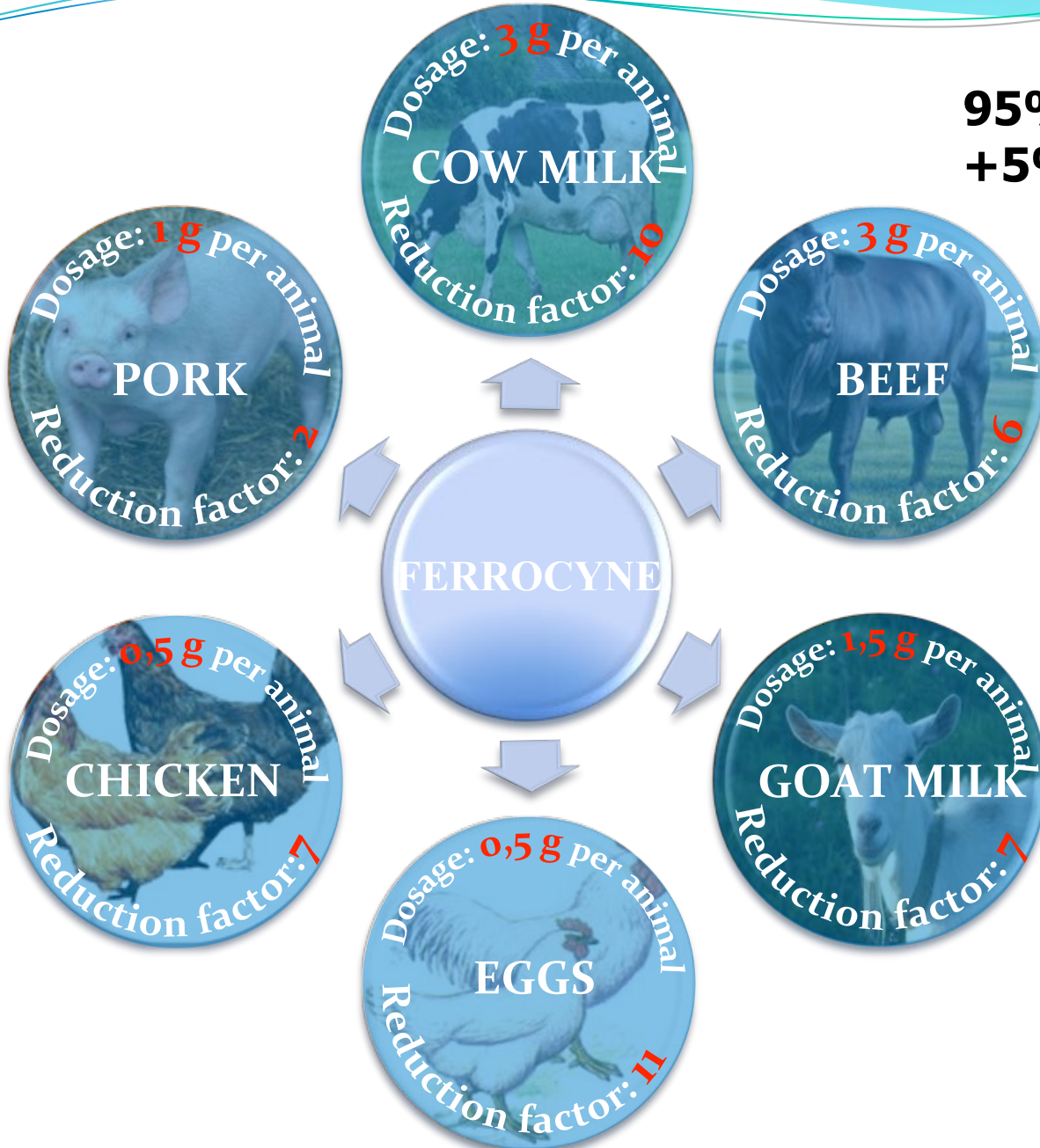
The Effects of Milk Processing on ^{137}Cs and ^{90}Sr Concentrations in End Products



Tf- ratio of radionuclide concentration in end product to radionuclide concentration in milk (Bq/kg)



Application of Cesium Binders



Ferrocyne

95% $\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
+5% $\text{KFe}[\text{Fe}(\text{CN})_6]$

Giese Salt

$\text{NH}_4\text{Fe}[\text{Fe}(\text{CN})_6]$

Nigrovich Salt

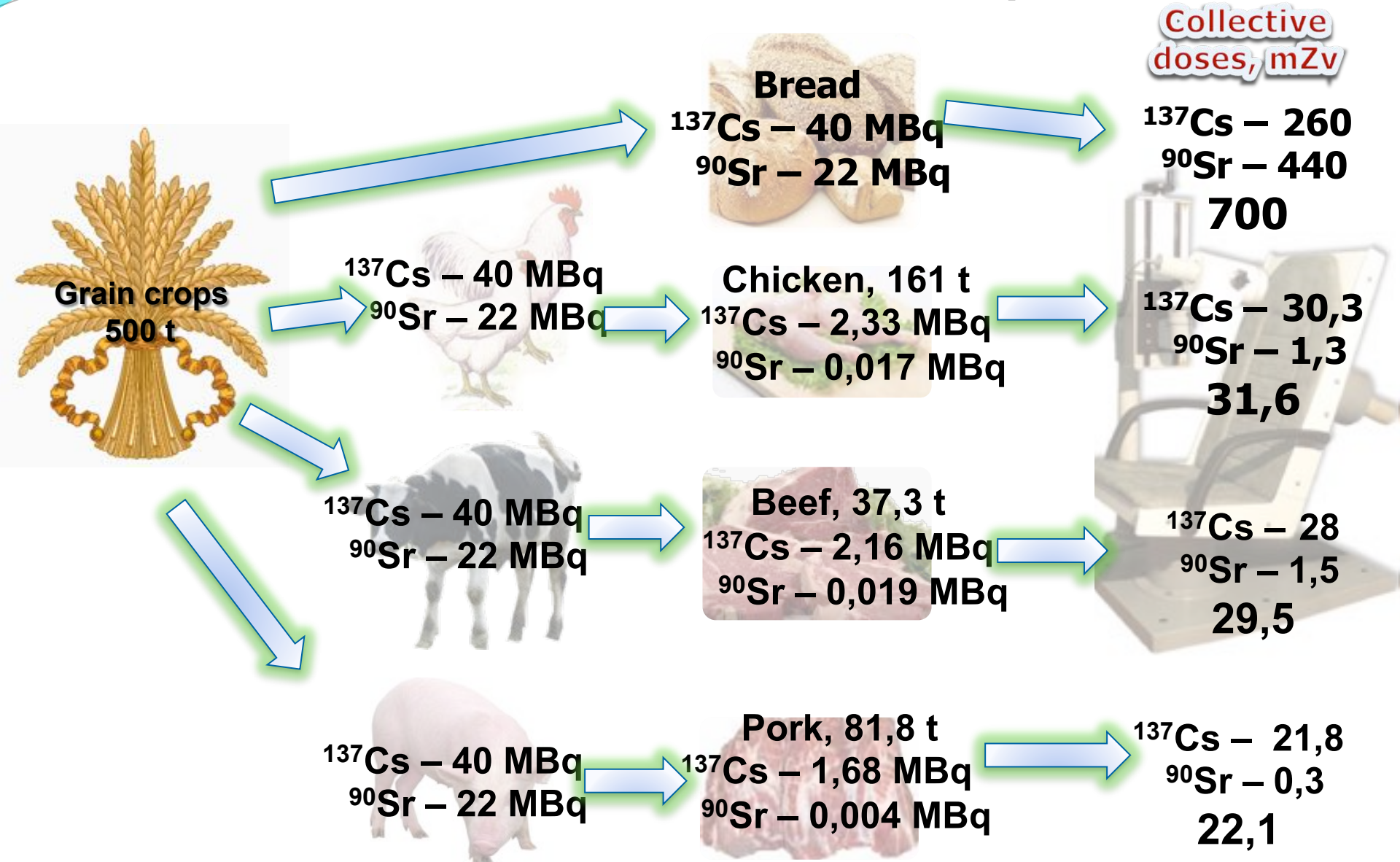
$\text{KFe}[\text{Fe}(\text{CN})_6]$

Reduction of Collective $^{137}\text{Cs}/^{90}\text{Sr}$ Doses via Changing Milk to Meat Production (given: the soil contains 20 kBq/m² ^{90}Sr and 1000 kBq/m² ^{137}Cs)

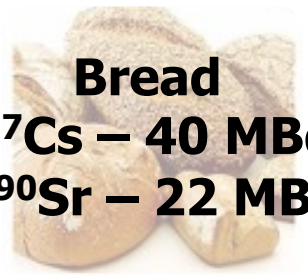
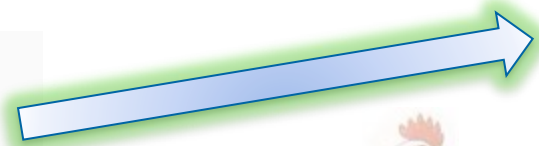




Collective Radiation Doses after Alternative Use of Contaminated Grain Crops



Grain crops
500 t



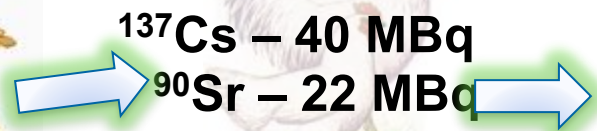
Bread

^{137}Cs – 40 MBq
 ^{90}Sr – 22 MBq

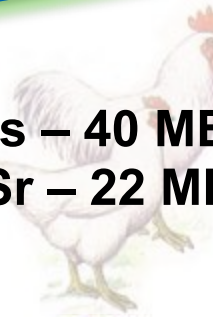


Collective doses, mZv

^{137}Cs – 260
 ^{90}Sr – 440
700

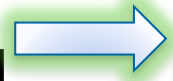


^{137}Cs – 40 MBq
 ^{90}Sr – 22 MBq



Chicken, 161 t

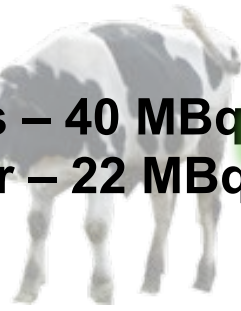
^{137}Cs – 2,33 MBq
 ^{90}Sr – 0,017 MBq



^{137}Cs – 30,3
 ^{90}Sr – 1,3
31,6

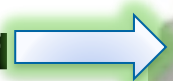


^{137}Cs – 40 MBq
 ^{90}Sr – 22 MBq

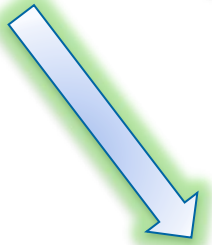


Beef, 37,3 t

^{137}Cs – 2,16 MBq
 ^{90}Sr – 0,019 MBq



^{137}Cs – 28
 ^{90}Sr – 1,5
29,5

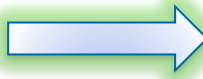


^{137}Cs – 40 MBq
 ^{90}Sr – 22 MBq



Pork, 81,8 t

^{137}Cs – 1,68 MBq
 ^{90}Sr – 0,004 MBq



^{137}Cs – 21,8
 ^{90}Sr – 0,3
22,1

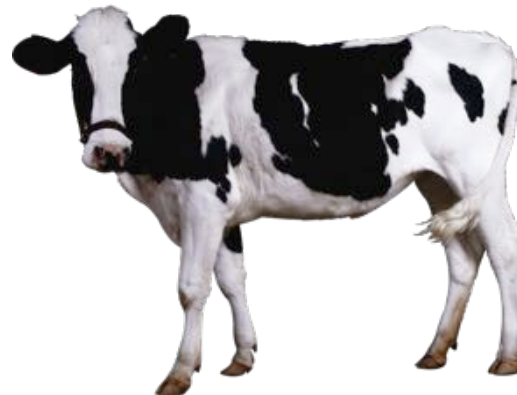
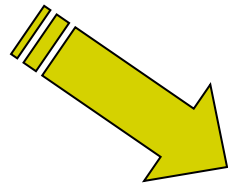
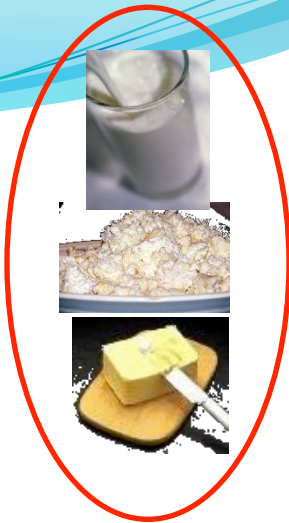
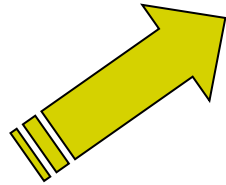


COMPOSITION OF DAIRY AND BEEF CATTLE RATIONS FOR DIFFERENTIATED USE OF FEED WITH VARIOUS LEVELS OF RADIOACTIVE CONTAMINATION

Dr. Viktor S. Averin

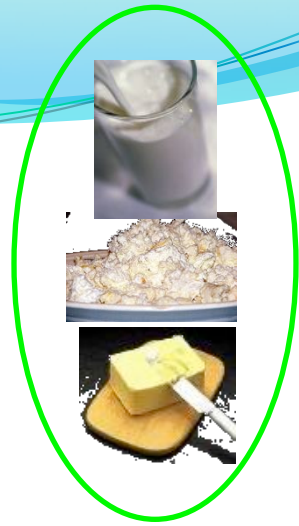
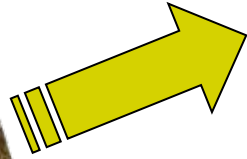


Act_{mean}

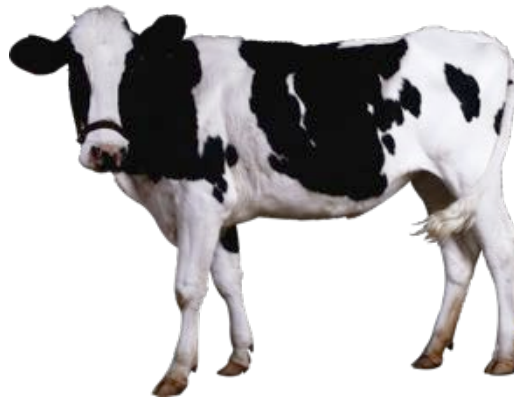
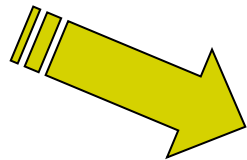
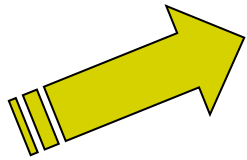




Act_{min}

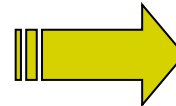
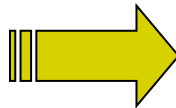
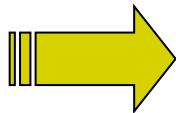


Act_{max}





Act_{max}



Act_{min}



Recommended terms for cleaning livestock to obtain beef under 500 Bq/kg

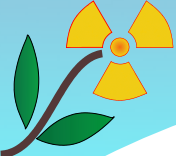
Initial activity concentration of ^{137}Cs in muscle tissue, Bq/kg	Activity concentration of ^{137}Cs in feeding ration, Bq/day	Cleaning terms, days	
		no ferrocyanides applied	ferrocyanides applied
500	1000	7	not applied
	2000	10	not applied
	3000	14	not applied
700	1000	20	not applied
	2000	25	not applied
	3000	30	20
	4000	45	30
1000	1000	30	20
	2000	40	25
	3000	50	35
	4000	60	40
	5000	90	50
1400	1000	60	35
	2000	65	40
	3000	75	45
	4000	85	50
	5000	100	60



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CALCULATION SOFTWARE: Dairy and Beef
Cattle Ration Composition for Differentiated
Use of Feed with Various Cs-137
Concentration Levels



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On-farm feed availability | Feed ration | Results

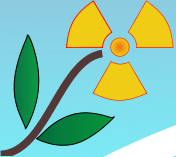
Hay | Haylage | Silage | Straw | Concentrates | Root crops

Number of forage groups

Forage/Storage site	Forage amount, kg	Activity concentration in forage, Bk/kg	Feed units	Digestible protein, g	Sugar, g	Phosphor, g	Calcium, g	Carotin, mg
Com	500000	25	0.15	15	1	0.4	2.8	5.5
Herbal	400000	180	0.15	15	1	0.4	2.8	5.5

Republican standard for the content of cesium in food products

Milk, Bq/l	Meat, Bq/kg
100	500



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On-farm feed availability | **Feed ration** | Results

Lactating cows | Non-lactating (dry) cow | Springers | Fattening | Heifers under 12 months | Bulls 12 months | Heifers 13-18 months | First-calf heifers

Number of animals	Average weight	Average daily gain, g/day
80	500	600

Ration

Ration 1 (silage diet)

Ration 2 (haylage diet)

Ration 3 (mixed diet)

Live whole body measurement, Bq/kg

Estimated time before slaughter, day

with ferrocyanides

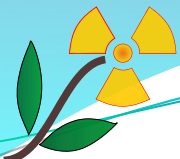
without ferrocyanides

Type of feed	Feed amount, kg	Activity concentration in feed, Bq/kg	Forage/Storage site
Hay	3.9	150	Stack 1
Silage	17.7	25	Corn
Straw	3	27	Straw 1
Concentrates	2	18	Mix 1
Root crops	5.9	11	Potato

Total Cs-137 in ration

1209.4 Bq/kg, Cs-137 level within the permissible limits

	Feed units	Digestible protein, g	Sugar, g	Phosphor, g	Calcium, g	Carotin, mg	Calcium/phosfor	Sugar/g
Recommend	3	300	640	48	72	240		
Actual value	3.3	643.6	680.7	26.6	89.6	130.7	1.1	3.4
Difference	0.3	-156.4	40.7	-21.4	17.7	-109.3		



Doses of internal irradiation of ^{137}Cs and ^{90}Sr in view of the received admissible levels in foods, acting on the territory of Belarus, Russia, Ukraine and the Uniform sanitary requirements of the Customs Union, mSv / year

Радионуклид	Республика Беларусь РДУ-99	Российская Федерация СанПин 2.3.2.1078-01	Украина	Таможенный союз
Цезий-137	0,78	1,20	0,70	0,59
Стронций-90	0,08	0,93	0,33	0,96
Суммарная доза	0,86	2,13	1,03	1,55



**Thank you
for your kind attention!**