



## **THEME 1: Radioactive Release Assessment**

### **Working Group 3 (IWG)**

The Chernobyl I-131 release:

models' validation and assessment of the countermeasures effectiveness

Pawel Krajewski

EMRAS Iodine Working Group Leader



## EMRAS Iodine Working Group

### main targets of IWG

check models applicability to evaluation of countermeasures effectiveness

#### Countermeasures:

- administration of stable iodine
- restriction of cows pasturing
- limitation of fresh milk consumption

uncertainty ?, limitation ?, requested input data ?



**EMRAS Iodine Working Group**

## **environmental modelling exercises on radioiodine**

- **to test and compare models' predictions with real environmental data**
- **to intercompare modelling approaches and model predictions among several assessors**



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**completed tasks**

**Final evaluation of  $^{131}\text{I}$  WARSAW Scenario**

predictions of 6 modellers

**Final description of  $^{131}\text{I}$  PRAGUE Scenario**

expected predictions of 7 modellers



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IAEA Headquarters, Vienna, 6–10 November 2006

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2<sup>nd</sup> run of predictions for <sup>131</sup>I PRAGUE Scenario  
expected data from 6-7 modellers

<b>UniVes</b>	<b>B. Kanyár</b>	<b>Hungary</b>	<b>University of Pannonia (former University of Veszprém)</b>
<b>Ecosys-87</b>	<b>M. Ammann</b>	<b>Finland</b>	<b>Radiation &amp; Nuclear Safety Authority (STUK)</b>
<b>CLIMRAD</b>	<b>O. Vlasov</b>	<b>Russian Federation</b>	<b>Medical Radiological Research Center</b>
<b>CLRP</b>	<b>P. Krajewski</b>	<b>Poland</b>	<b>Central Laboratory for Radiological Protection</b>
<b>OSCAAR</b>	<b>T. Homma</b>	<b>Japan</b>	<b>Japan Atomic Energy Agency (JAEA)</b>
<b>IRH-model</b>	<b>I. Zvonova</b>	<b>Russian Federation</b>	<b>Institute of Radiation Hygiene</b>
<b>SPADE</b>	<b>P. Kennedy</b>	<b>UK</b>	<b>Food Standard Agency</b>

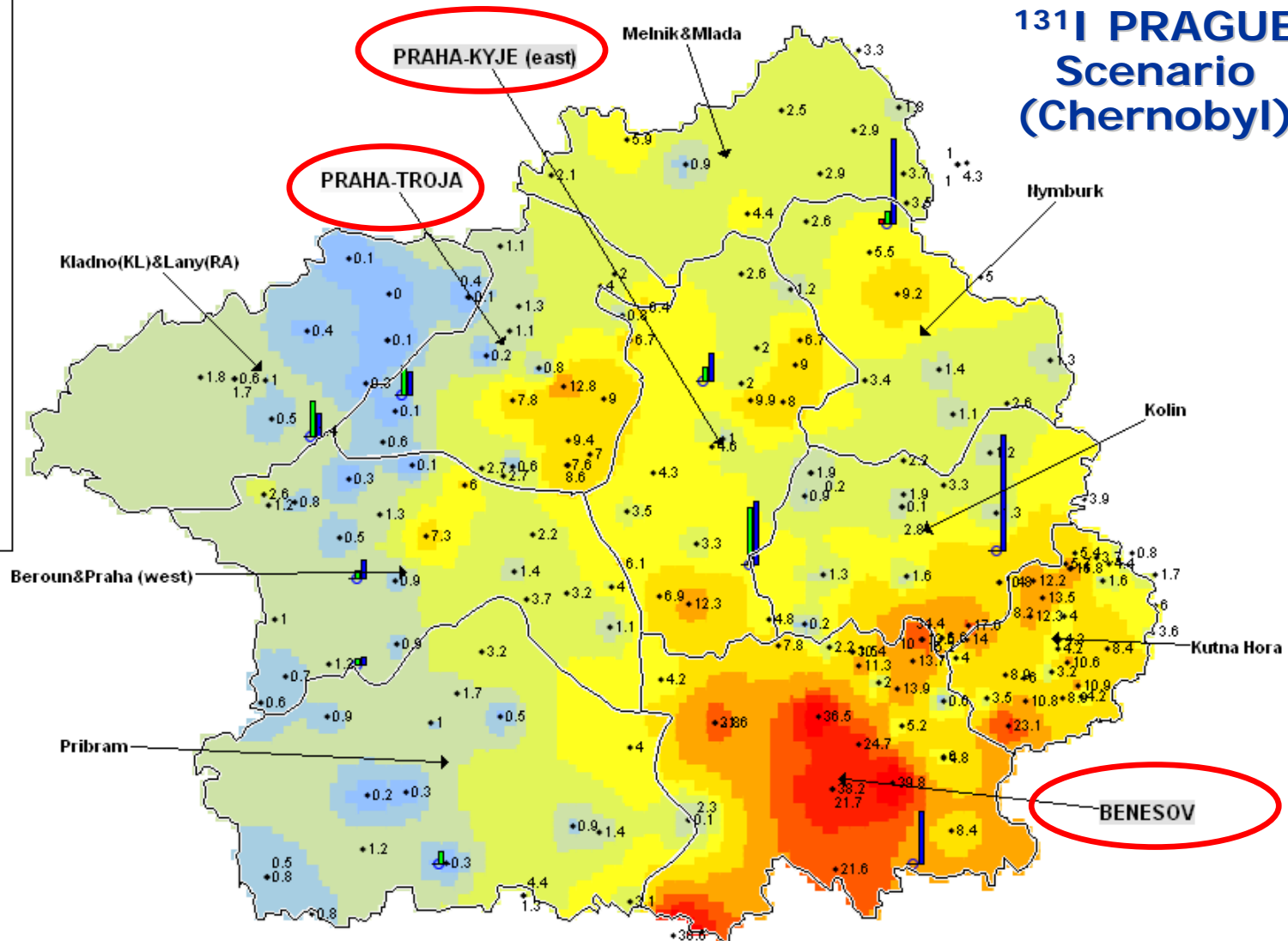
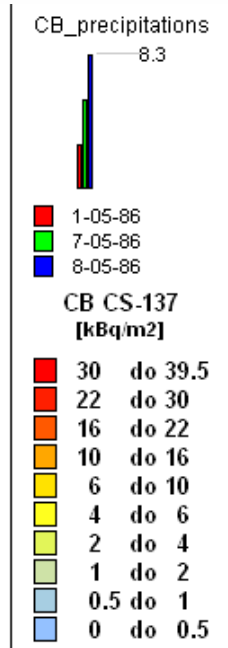


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### <sup>131</sup>I PRAGUE Scenario (Chernobyl)



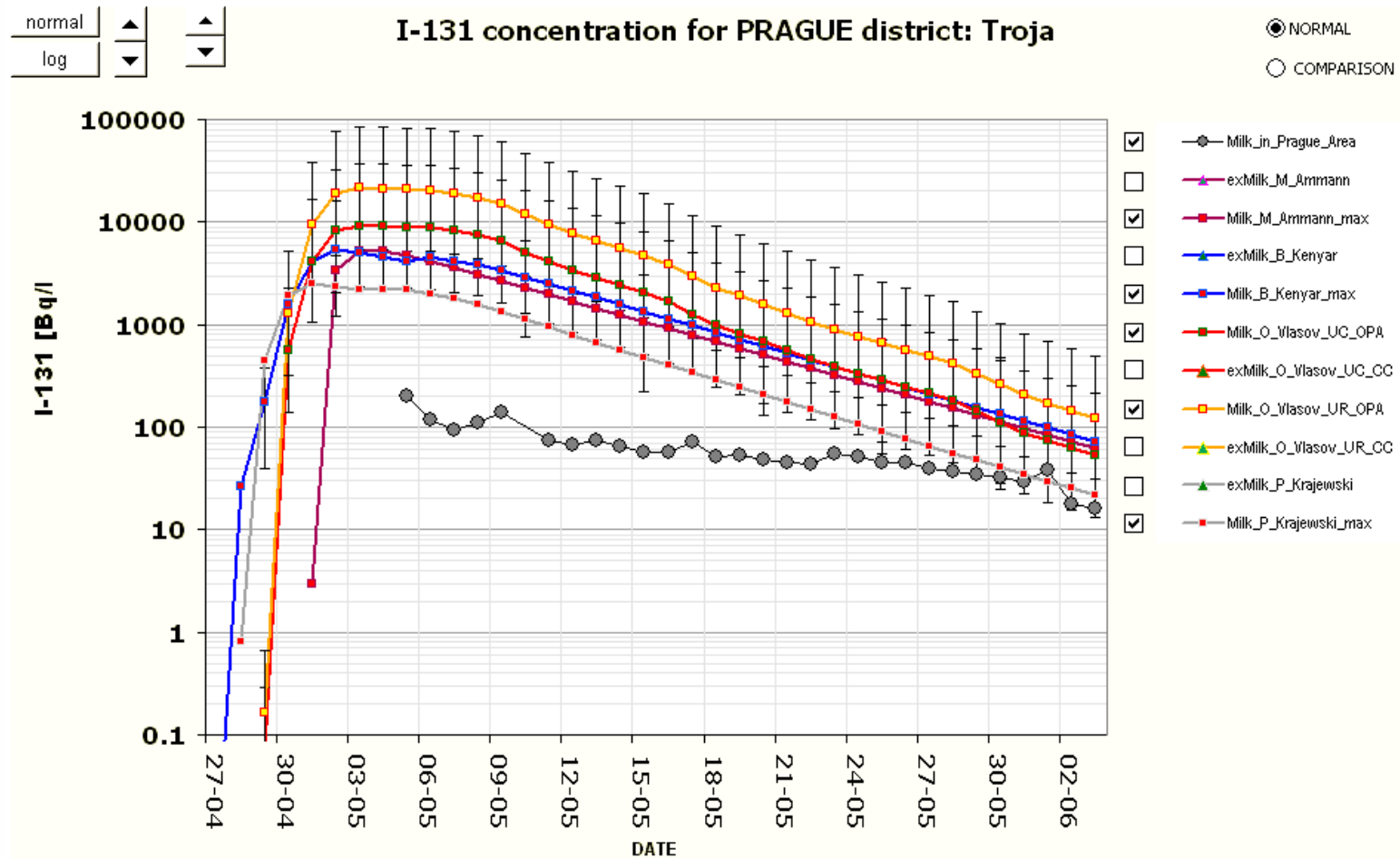


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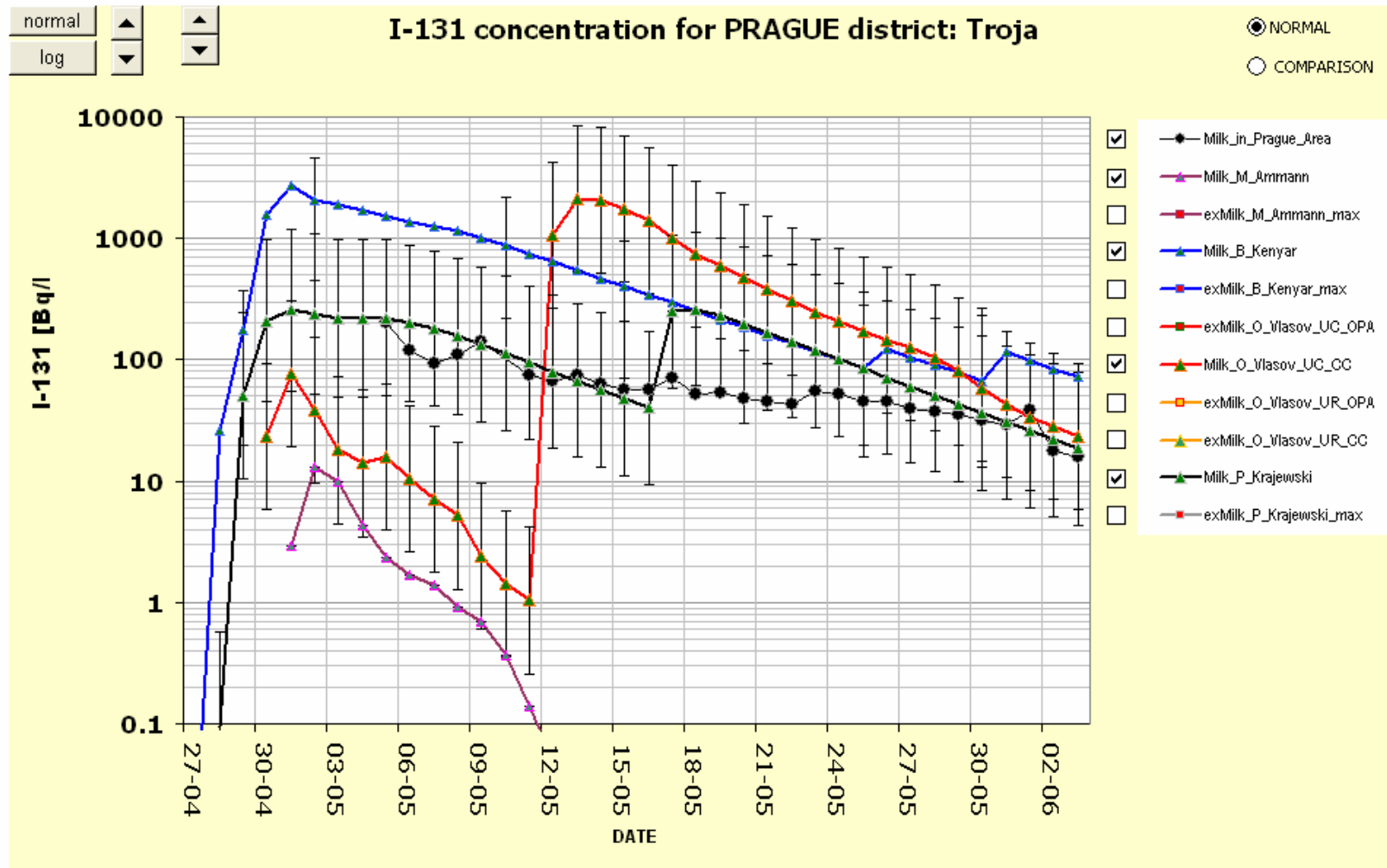


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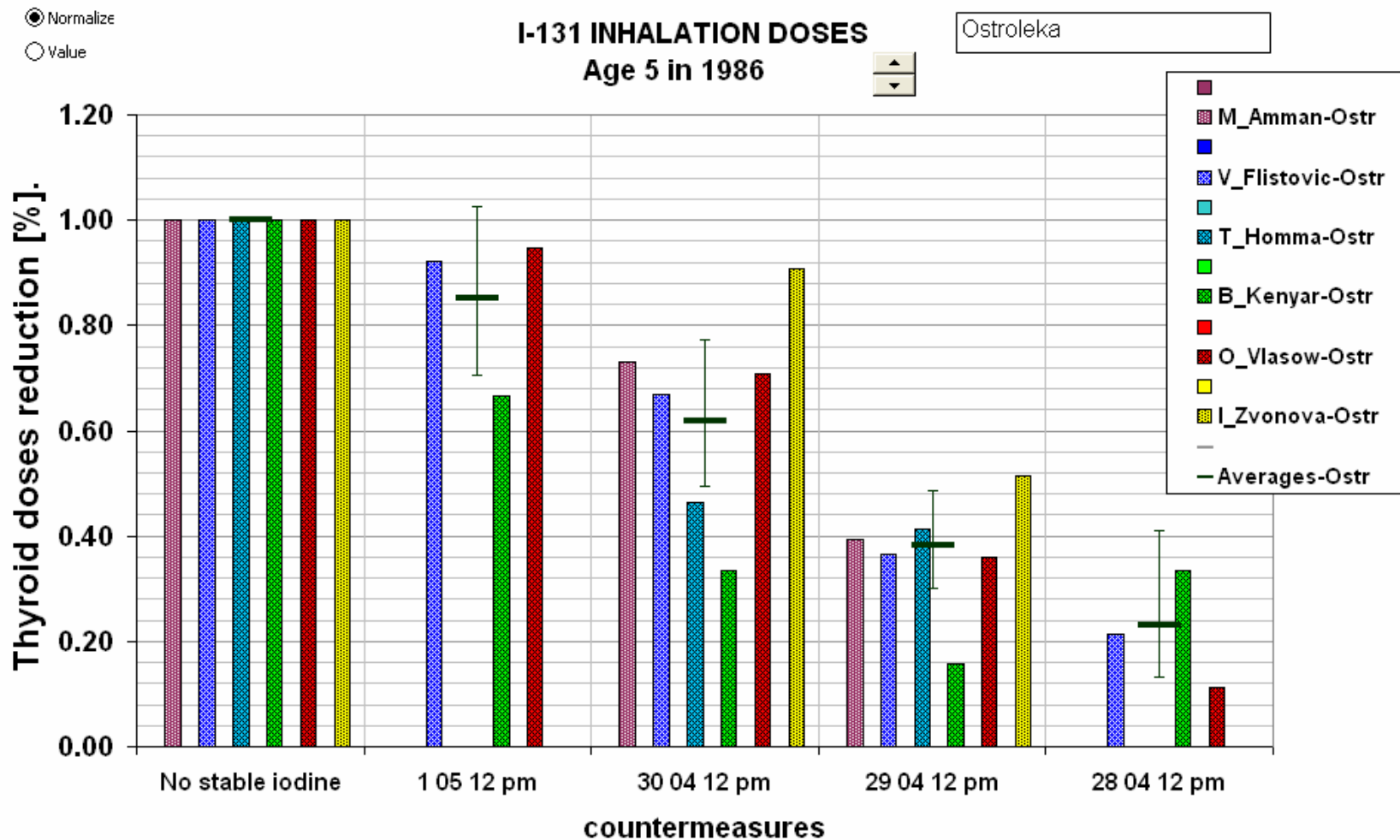




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final evaluation of <sup>131</sup>I WARSAW Scenario

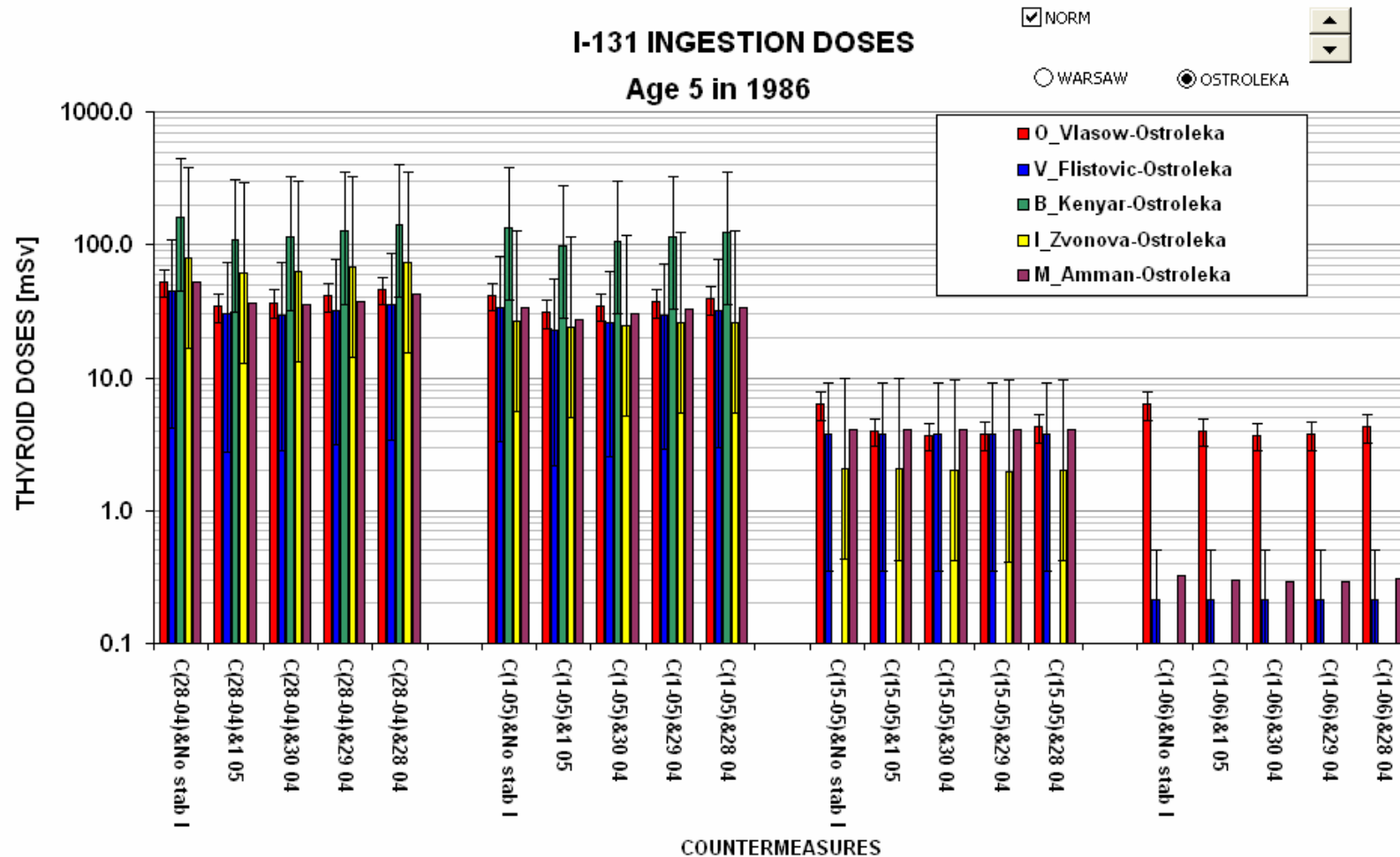




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**<sup>131</sup>I PRAGUE Scenario (Chernobyl)**

important issues:

**I. Lack of information about:**

- cows feeding practices in transitional period (winter-summer)
- spatio-temporal monitoring data on : air concentrations, iodine forms and deposition.

is typical in the real accidental conditions and was a major source of discrepancies between predicted and observed <sup>131</sup>I in milk data,

- 2. during the early period of emergency the monitoring data on air concentration, iodine form, deposition density as well as comprehensive data on milk contamination are required for improvement of reliability of thyroid exposures model predictions**



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important issues (cont.):

3. feeding cow practices applied in Prague region (e.g. keeping cows in cow-sheds and using not contaminated fodder ) might reduced integrated <sup>131</sup>I concentration in milk by factor about 5 (4-10) comparing with milk originated from cows pastured in open area,
4. prevention of milk contamination by stabling cows without adding fresh contaminated by <sup>131</sup>I grass is an effective countermeasure,
5. stable iodine intake is useful measure against inhalation exposure,



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**IWG contribution to the TRS-364 GROUP**

**comments and remarks to the TRS-364 TECDOC  
with respect of radioiodine**

**model of grass interception**

**in a case of mixed (dry&wet) radioiodine fallout with three forms of  
radioiodine: aerosol bound, elemental I<sub>2</sub>, organic CH<sub>3</sub>I**

**iodine milk transfer factor**

**cow iodine metabolic model, uncertainty range,  
dependence of milk transfer factor on cows diet and cow's milk  
productivity**



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## MILESTONES PLANNED

### ● 26 January 2007

- 1 2<sup>nd</sup> and last run of predictions for Prague Scenario

### ● 16 - 28 February 2007

- 1 disclosing data on  $^{131}\text{I}$  thyroid contents of Prague inhabitants
- 1 evaluation of Prague Scenario  
(report and data sent out to participants)

### ● 30 March 2007

- 1 deadline for comments, remarks



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**MILESTONES PLANNED**

● **23–27 April 2007**



International Conference on Environmental Radioactivity:  
From Measurements and Assessments to Regulation, Vienna

**IWG a contributed paper to the conference**

Validation of dosimetry models and assessment of the countermeasures effectiveness using data from Chernobyl <sup>131</sup>I releases

● **30 May 2007**



completed draft of IWG TECDOC

full set of 3 Scenarios

(input data, output data, evaluations, recommendations)



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**MILESTONES PLANNED**

● **25 – 29 June 2007**



**IWG Working Group meeting (2 options)**

1. Institute of Radiation Hygiene of the Ministry of Public Health  
St. Petersburg, Russian Federation
2. at the IAEA Headquarters, Vienna

**main target**



**discussion and review of the draft of IWG TECDOC**

5<sup>th</sup> Combined Meetings of EMRAS

**draft of IWG TECDOC**





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**Thanks for your attention**

**Pawel Krajewski**