DETERMINATION OF ^{90}SR IN MILK AND WATER SAMPLES BY USING EICHROM'S RESIN

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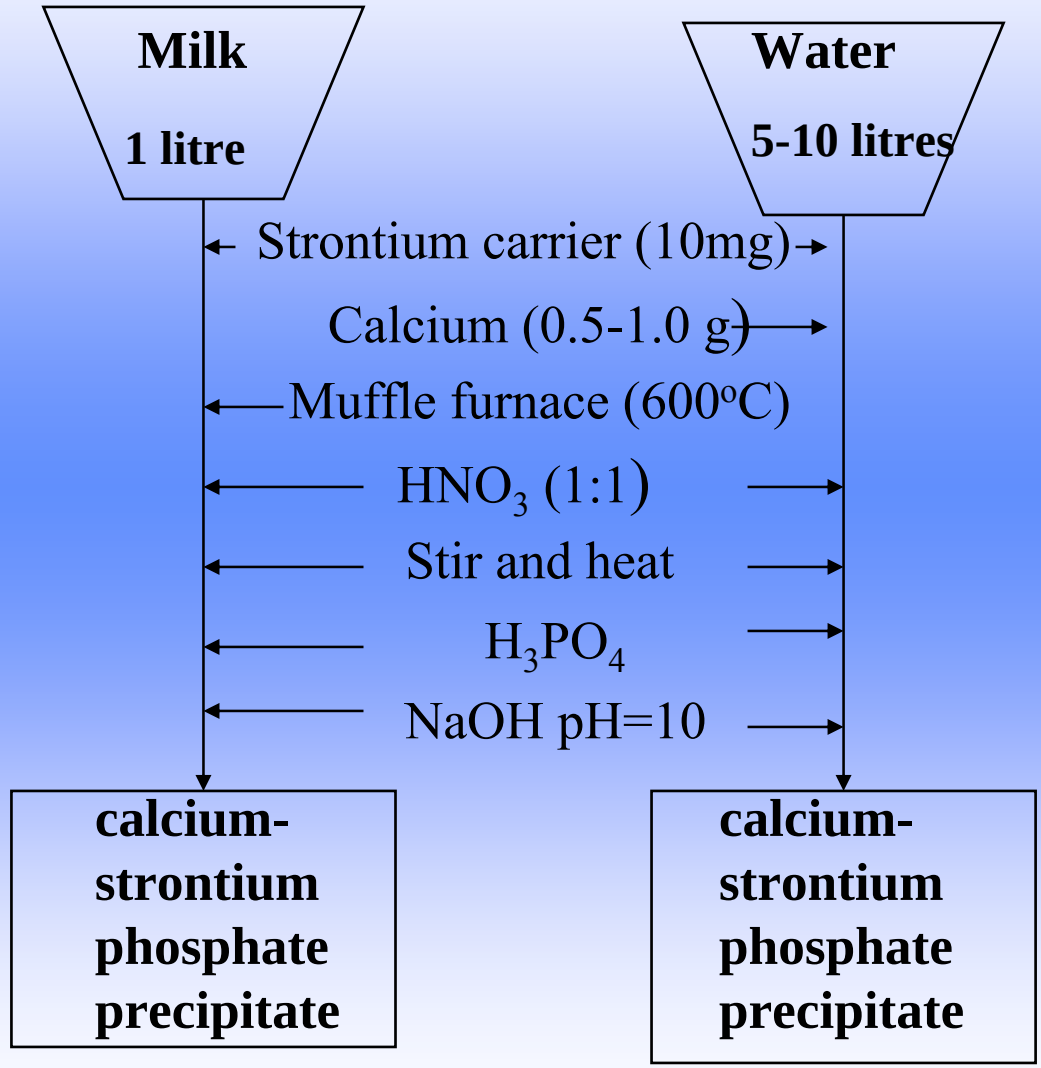
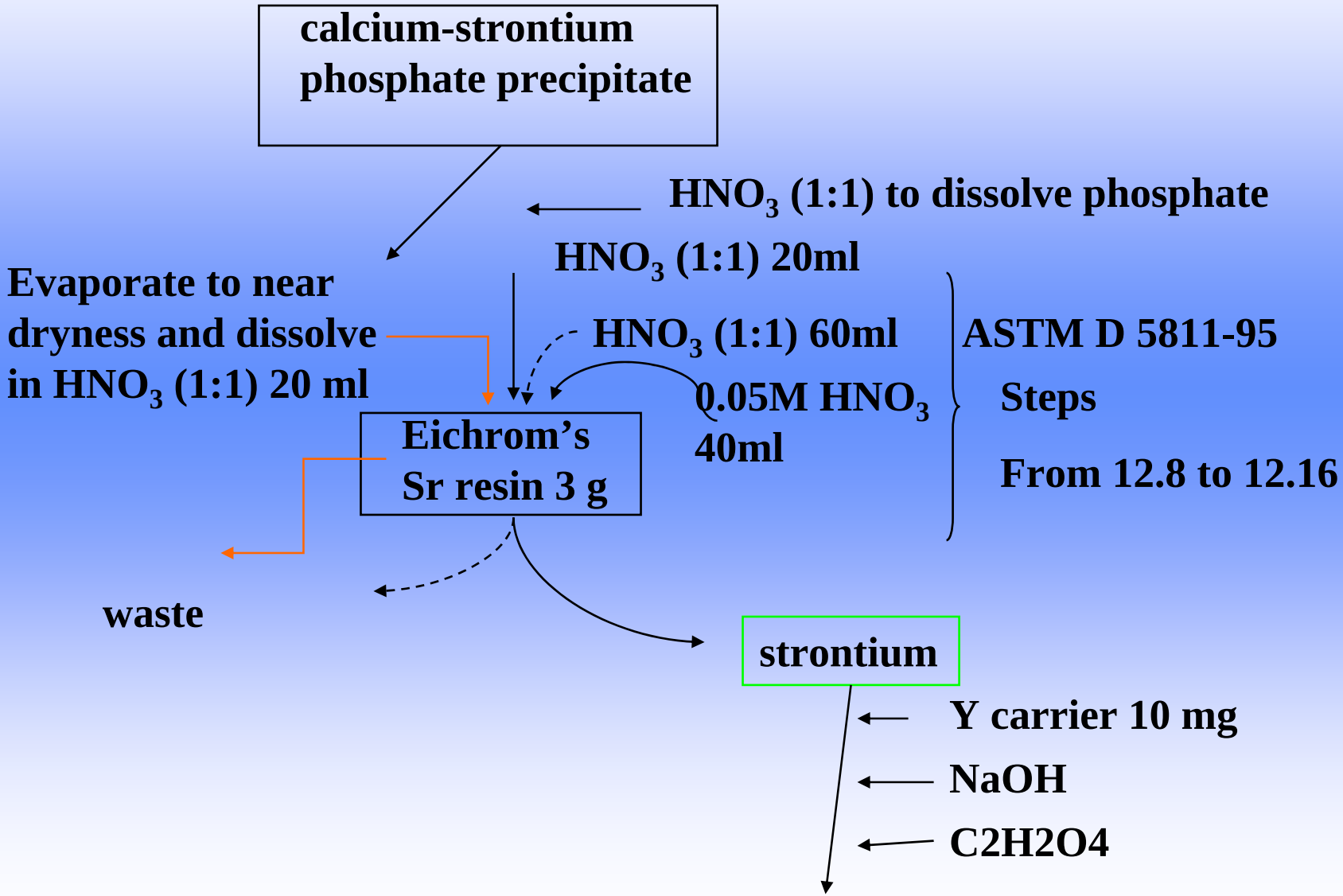
Introduction

- **Article 35 of the Euratom Treaty requires that each Member State establish facilities necessary to carry out continuous monitoring of the levels of radioactivity in air, water, soil, foodstuffs and ensure compliance with the Basic Safety Standards**
- **The most complicated method is method for strontium analysis in environmental samples**
- **Task to find a simple and useful method for strontium analysis in all types of environmental samples**

Sample preparation



Sample preparation



Calculation

$$A_{Sr} = \frac{\frac{N_S}{T_S} - \frac{N_B}{T_B}}{\eta . Y_{Sr} . Y_Y . V . e^{-\lambda_Y . \Delta T}}$$

where:

N_S - sample counts,
N_B - background counts,
T_S - time of sample measurement,
T_B - time of background measurement,
Y_{Sr} - chemical yield of Sr ,
Y_Y - chemical yield of Y ,
V - sample volume,
δT - time between Y separation and measurement,
λ_Y - decay constant of ^{90}Y,
η - efficiency

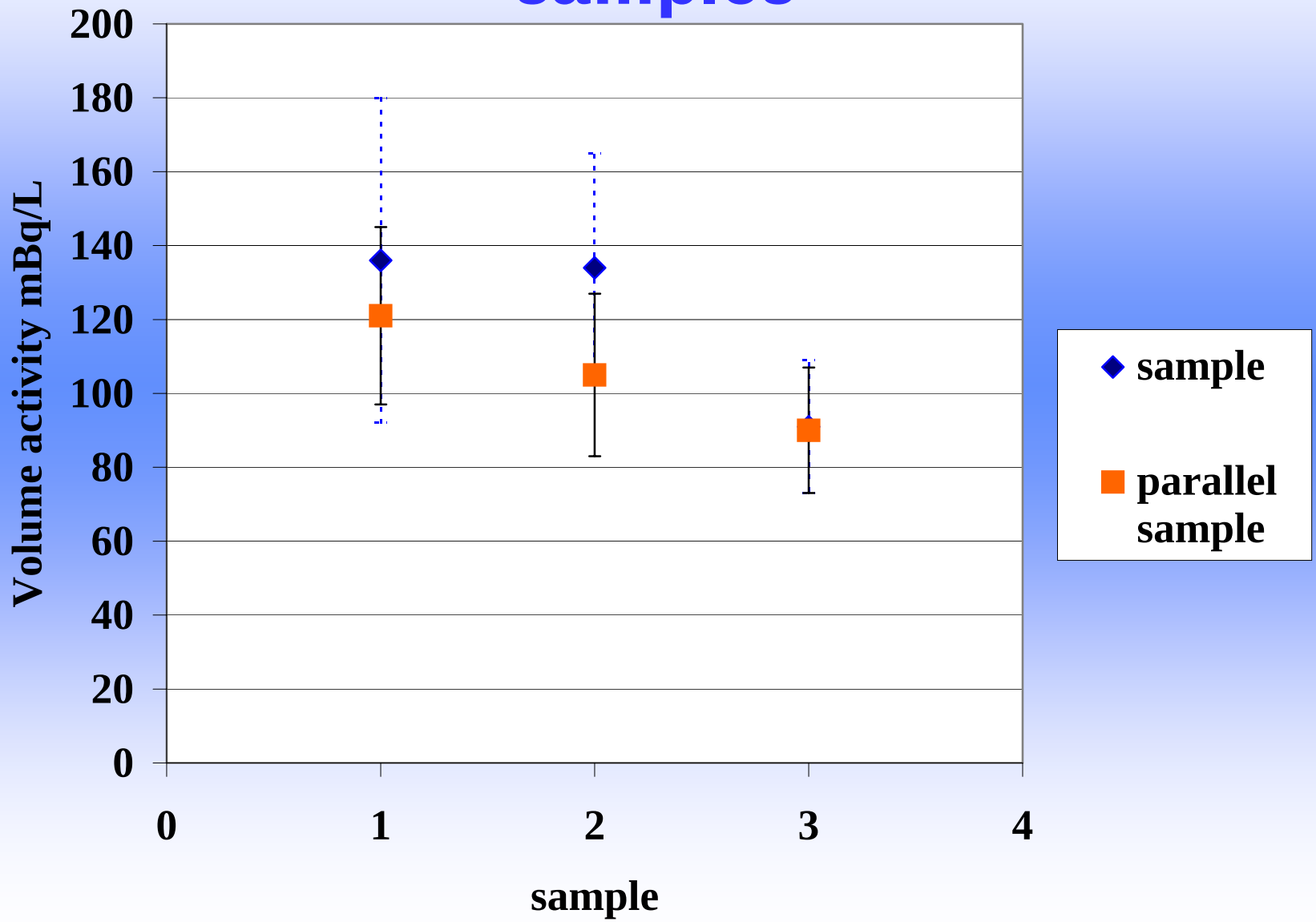
Calculation

$$MDA_{Sr} = \frac{1.64^2 + 2 \cdot 1.64 \cdot \frac{T_S}{T_B} \sqrt{N_B \left(1 + \frac{T_B}{T_S}\right)}}{\eta . Y_{Sr} . Y_Y . V . e^{-\lambda_Y . \Delta T}}$$

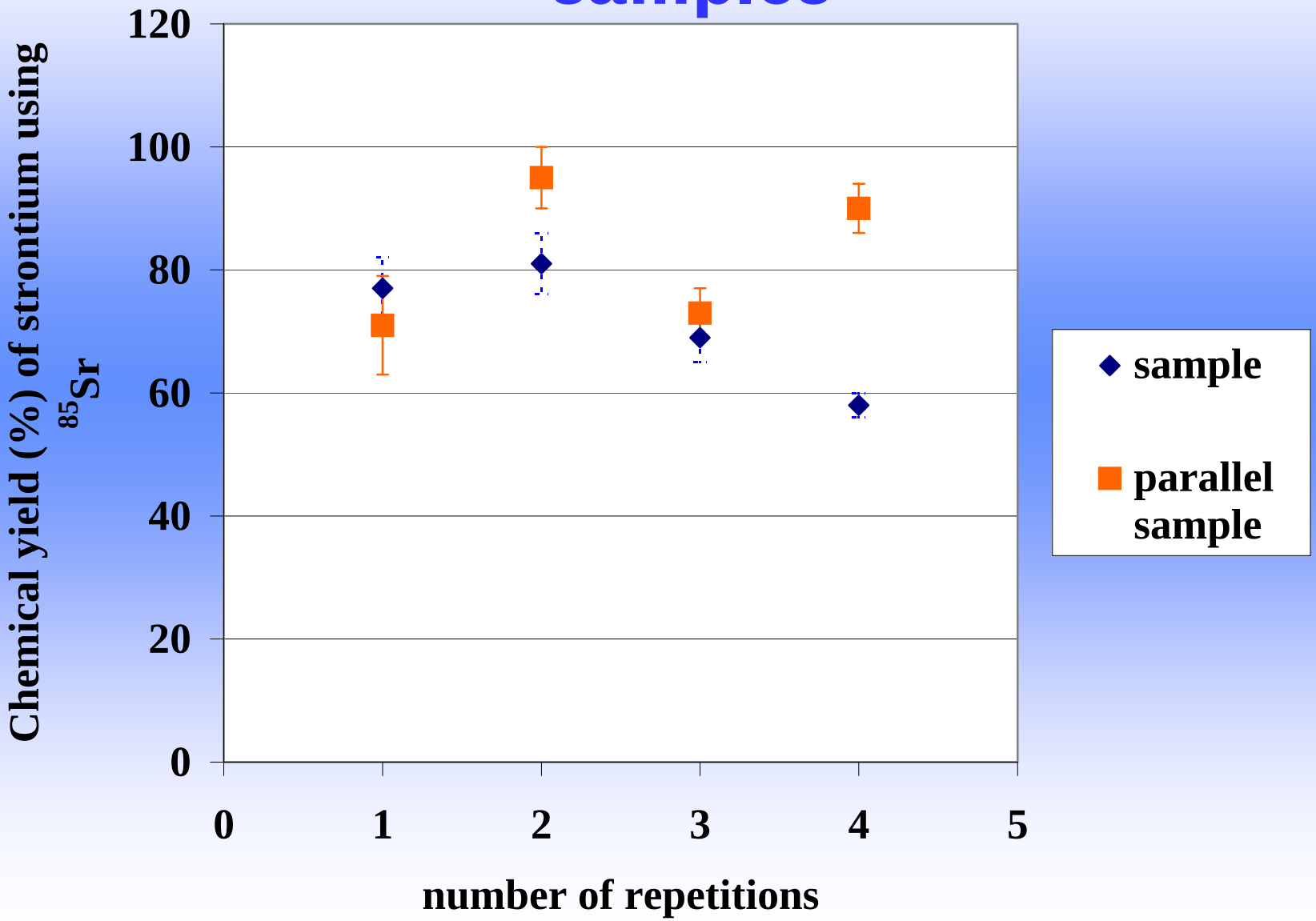
where:

N_B - background counts,
T_S - time of sample measurement,
T_B - time of background measurement,
Y_{Sr} - chemical yield of Sr,
Y_Y - chemical yield of Y,
V - sample volume,
δT - time between Y separation and measurement,
λ_Y - decay constant of ^{90}Y,
η – efficiency.

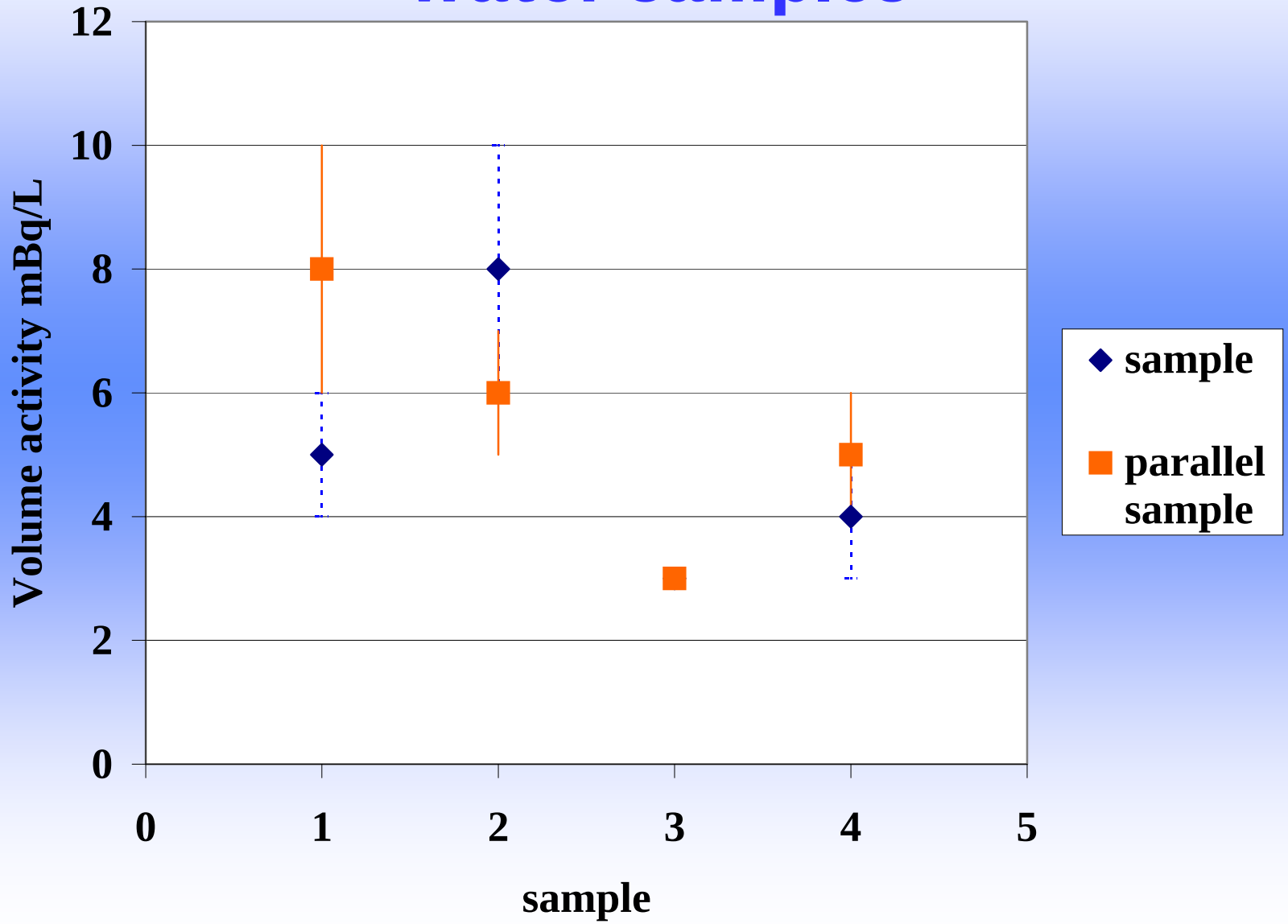
Results of strontium analysis in milk samples



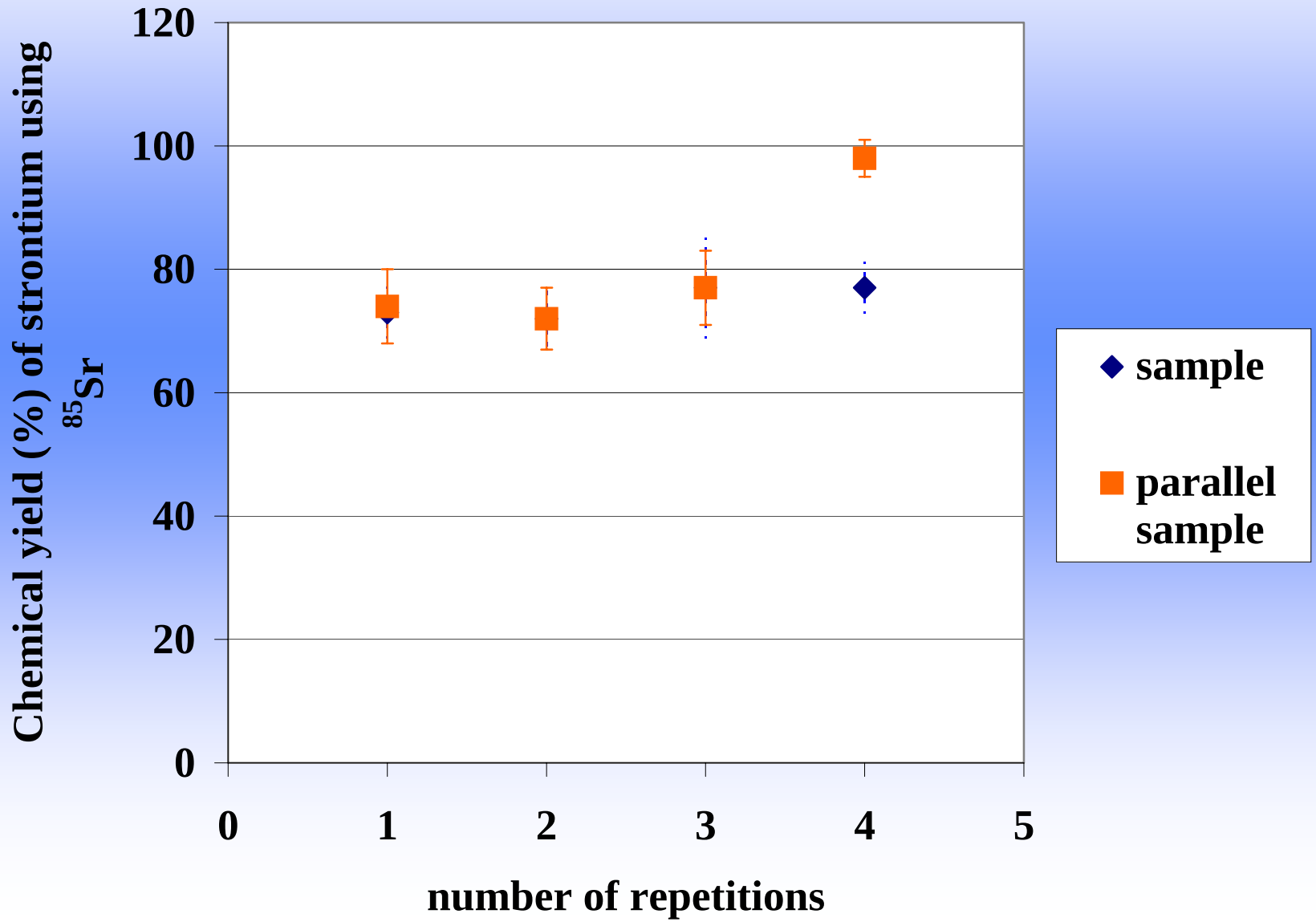
Results of strontium analysis in milk samples



Results of strontium analysis in water samples



Results of strontium analysis in water samples



Conclusions

- **Average chemical yield of yttrium was 85 %**
- **Chemical yield of strontium varied between 58 and 98 %**
- **Results of parallel samples were comparable**

Thank you for your attention