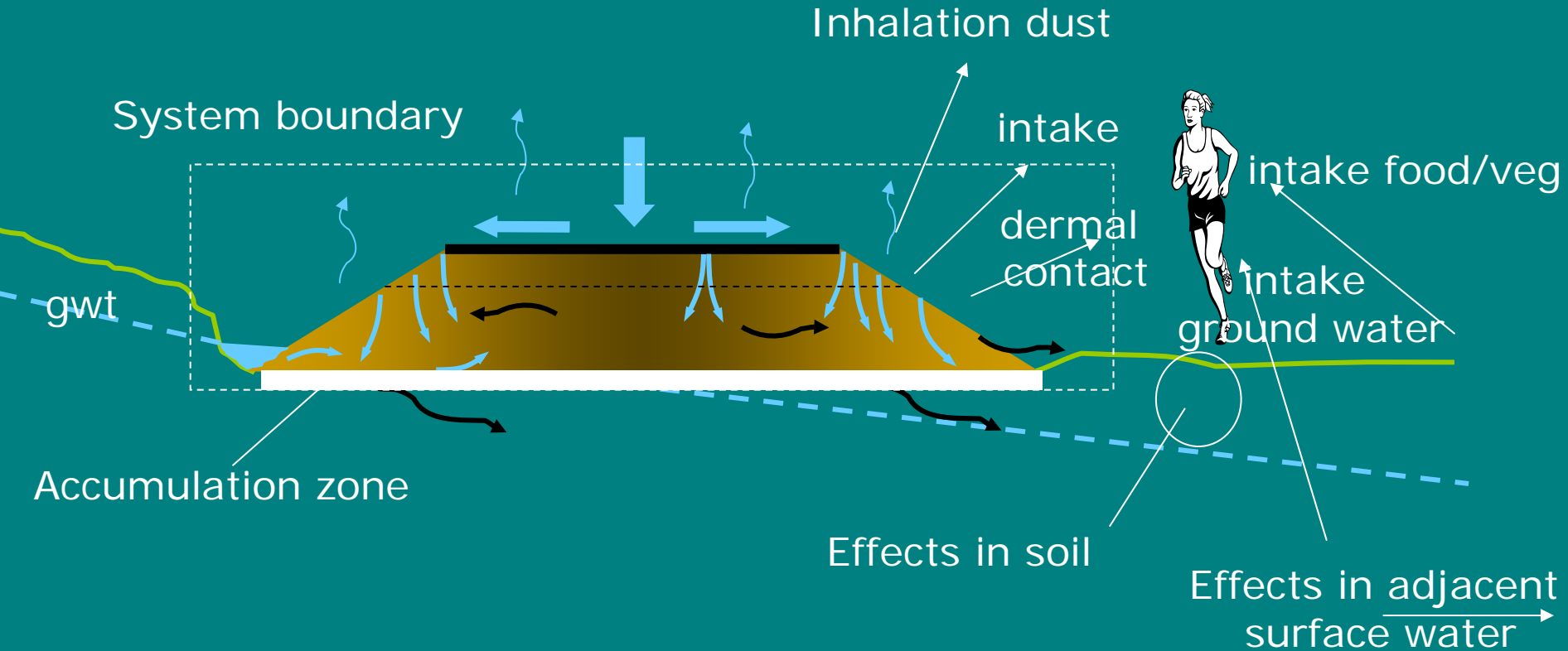


# Oral bioavailability of arsenic and a selection of metals in ashes

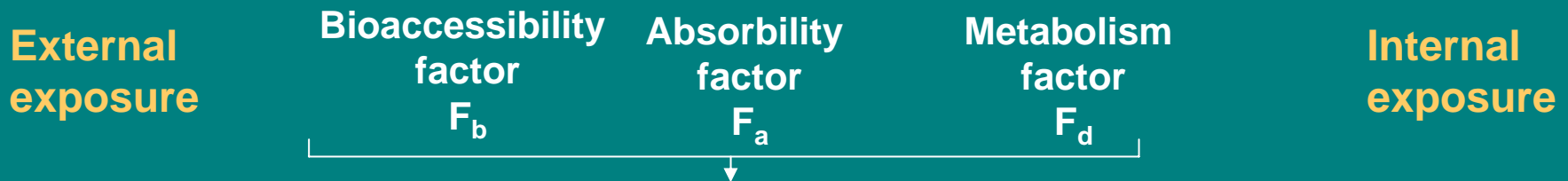
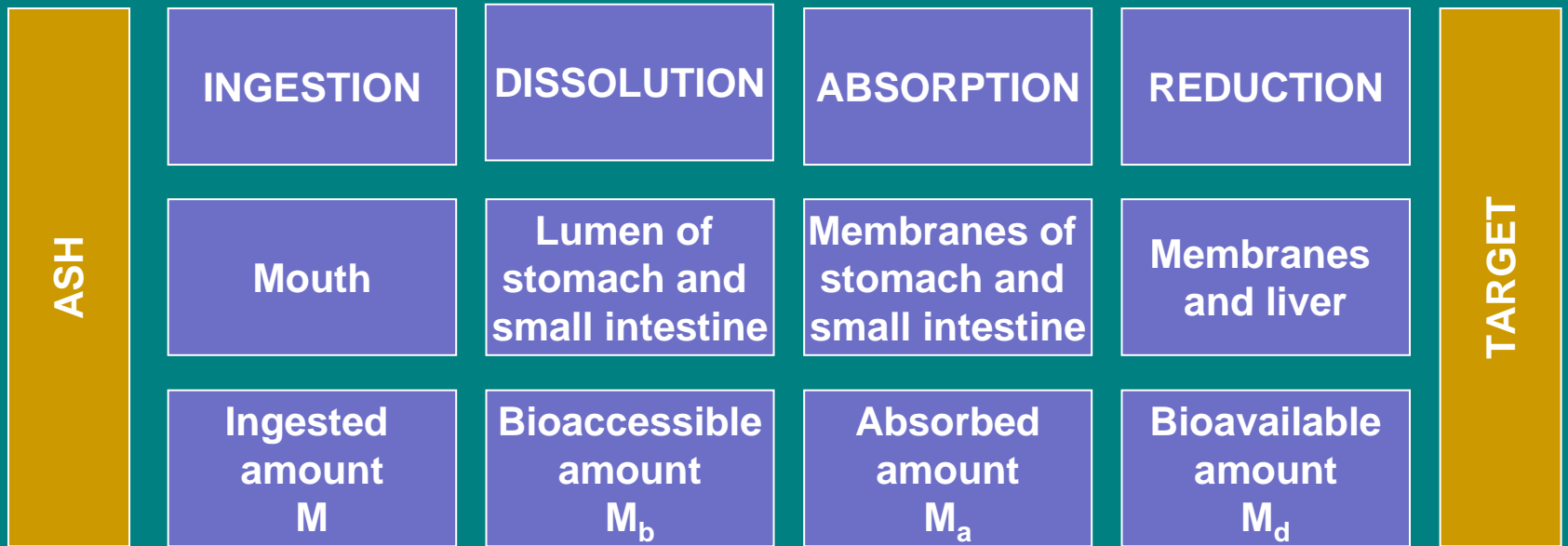
Christel Carlsson, Ola Wik & David Bendz - SGI  
Celia Jones - Kemakta

Supported by The Swedish Thermal Engineering Research Institute

# Background



# Definition of Bioavailability

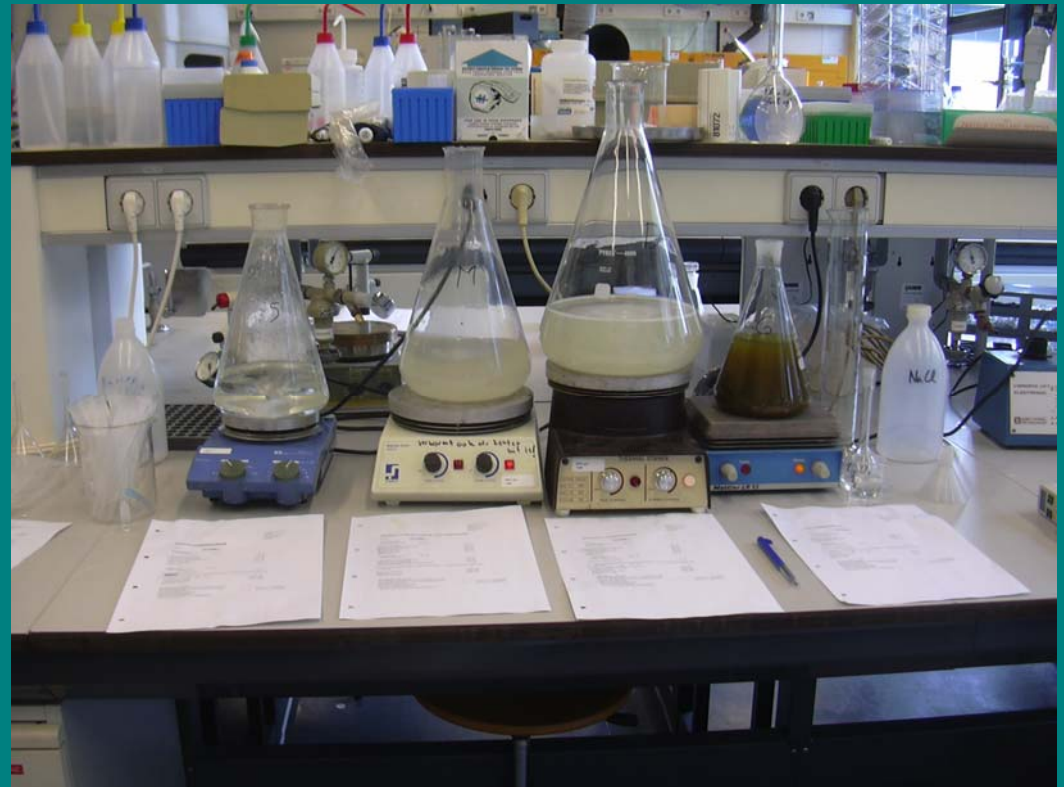


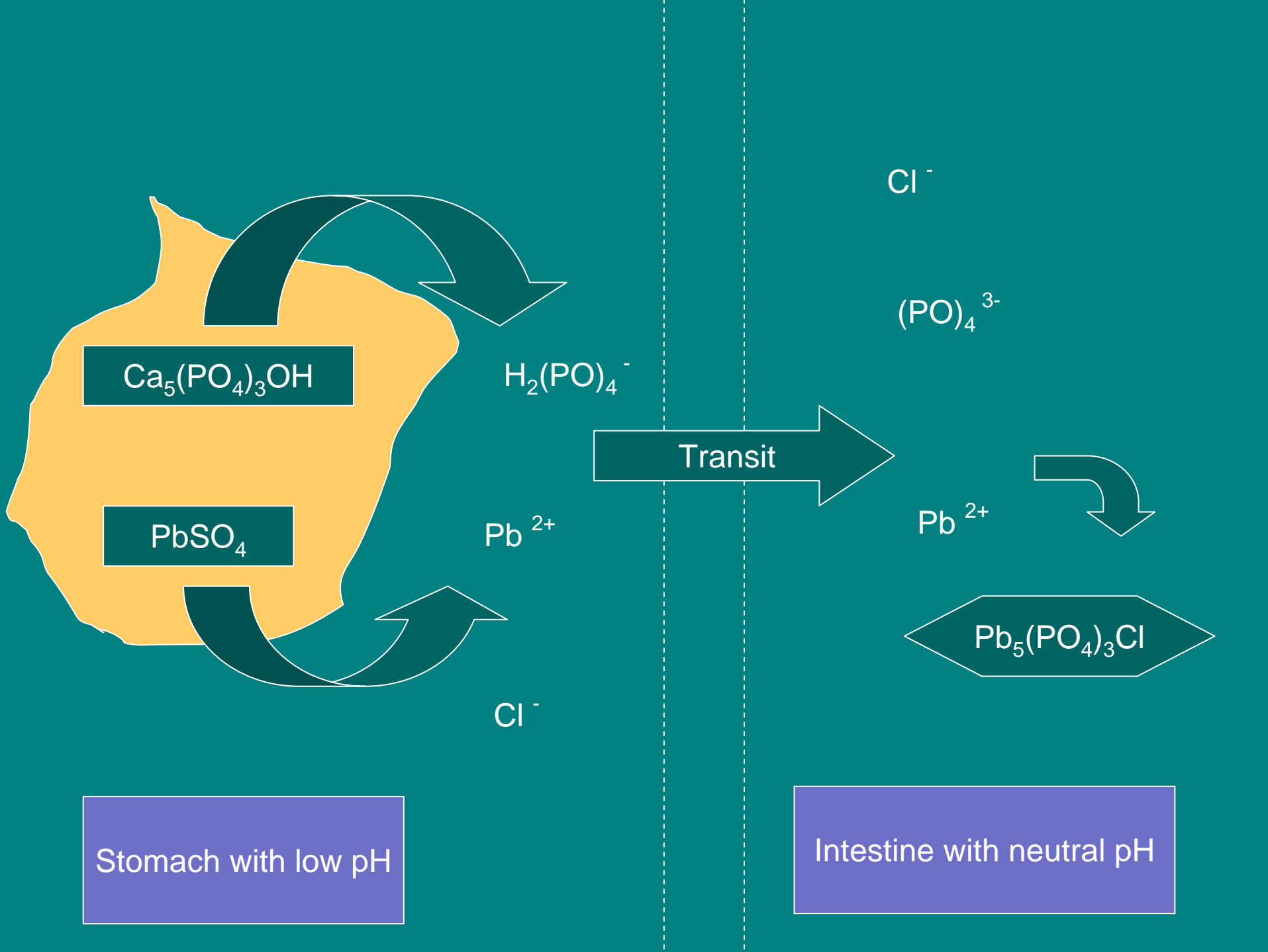
Oral bioavailability:  $F_{bad} = F_b \times F_a \times F_d$

## Method

The *in vitro* bioaccessibility test (RIVM) simulates the human gastrointestinal processes

- + Saliva
- + Gastric juice → pH=1.5
- + Duodenal juice
- + Bile → pH=6.5





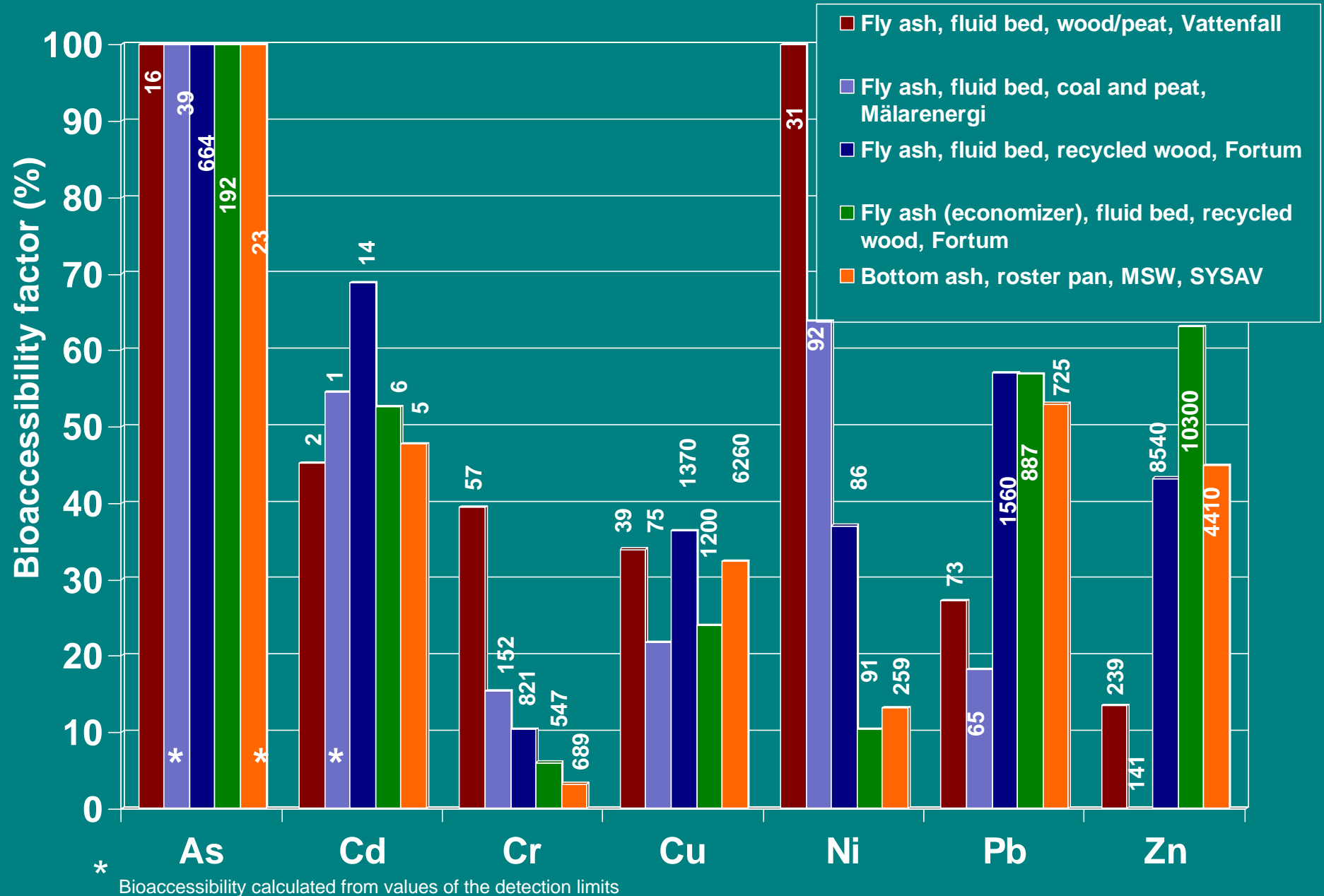
Transit



Stomach with low pH

Intestine with neutral pH

# Preliminary Results



## Conclusions

- With the exception of As the bioaccessibility factor is generally in the range of 5-70 %.
- The bioaccessibility factor depend on the element considered, rather than the type of ash (?)
- Indication of high bioaccessibility of As, but problem with analytical method.
- Indication of higher bioaccessibility in smaller particles (<63  $\mu\text{m}$ ) than in larger (<2000  $\mu\text{m}$ ).
- Problem with buffering ashes which demand high L/S ratios → results in lower precision in bioaccessibility.

# Whats next?

- Better resolution of the analysis of arsenic
- Use lower L/S ratios for ashes without buffering problems
- Analyse variation (more replicates)
- Study the influence of particle size on bioaccessibility
- Study bioaccessibility under anaerobic conditions (?)