

# **The organic approach to ensuring optimum minerals for animal health and product quality**

*Mette Vaarst, Aarhus University*

*Gidi Smolders, 'orgANIMprove', The Netherlands*

*... with thanks to Werner Zollitsch , BOKU and other good people who tried to help me out*



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# 'Organic': referring to IFOAM principles

## PRINCIPLES of ORGANIC AGRICULTURE

### *Principle of* **HEALTH**

Organic Agriculture should sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible.

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# How can principles guide mineral supply for ensuring animal health

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# This presentation: Reminders and examples

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**Resilience**

**‘Natural’**

**Give animals fair chances**

**Monitor and ‘care’**



# INTRODUCTION

## Currently: organic dairy farming in Denmark (... Europe...?)



- **‘Quite conventional’: bought-in supplementary feed & mineral supplement, following conventional recommendations**
- **Limited knowledge among farmers and advisors on issues like ...**
  - **‘natural feeds’, and**
  - **how to account for the variability caused by different soil types etc.**
- **Not much ‘farm-specific developments’**

# WHAT STARTED THE DEBATE FOR THIS SESSION?

## Debate on iodine in milk for human consumption

- Iodine in milk:
  - from teat dipping???

### Pregnant women in organic milk fear

By PRESS ASSOCIATION

PUBLISHED: 09:15 GMT, 28 April 2015 | UPDATED: 09:16 GMT, 28 April 2015



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16  
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Pregnant women who switch to "healthier" organic milk may be putting the brain development of their unborn babies at risk, experts have claimed.

Milk certified as organic contains about a third less iodine than conventionally-produced milk, according to a new study. The same was found to be true for "ultra-high temperature" (UHT)-processed long-life milk.

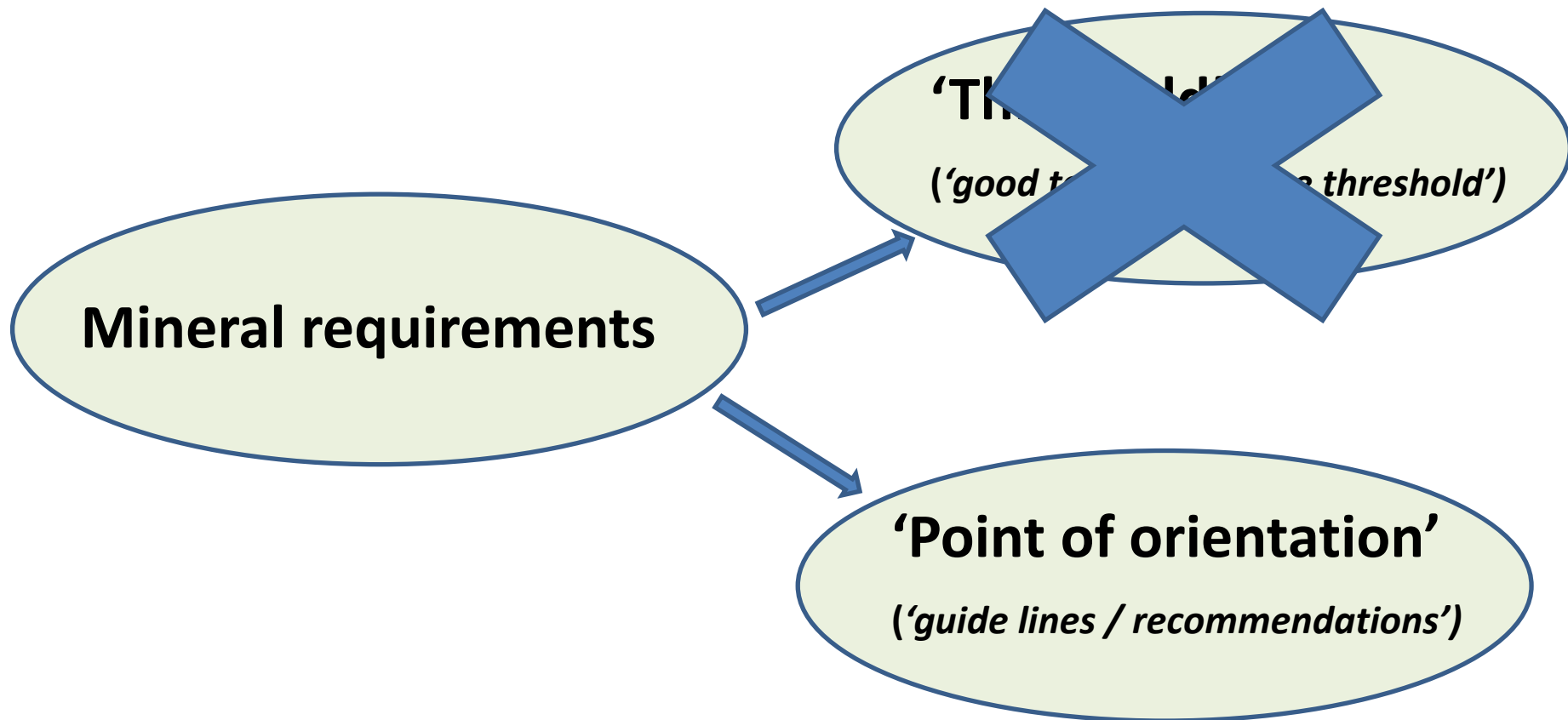
Since milk is the primary source of iodine in the UK diet, the discovery is said to have potentially serious health implications.



Drinking organic milk may deprive an unborn child of iodine, pregnant women are warned

Iodine is known to be important for the healthy brain development of babies, especially in the early stages of pregnancy.

# Workshop question: Can there be too much of 'a good thing'?





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# Resilience

# Resilience

## - the dynamic characteristic of 'health'

- '... the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables ...'

*(Holling, 1973)*



'Resilience as a universal criterion of health'  
Döring et al., 2014,  
*Journal of the Science of Food and Agriculture*

# Homeostasis = BALANCE



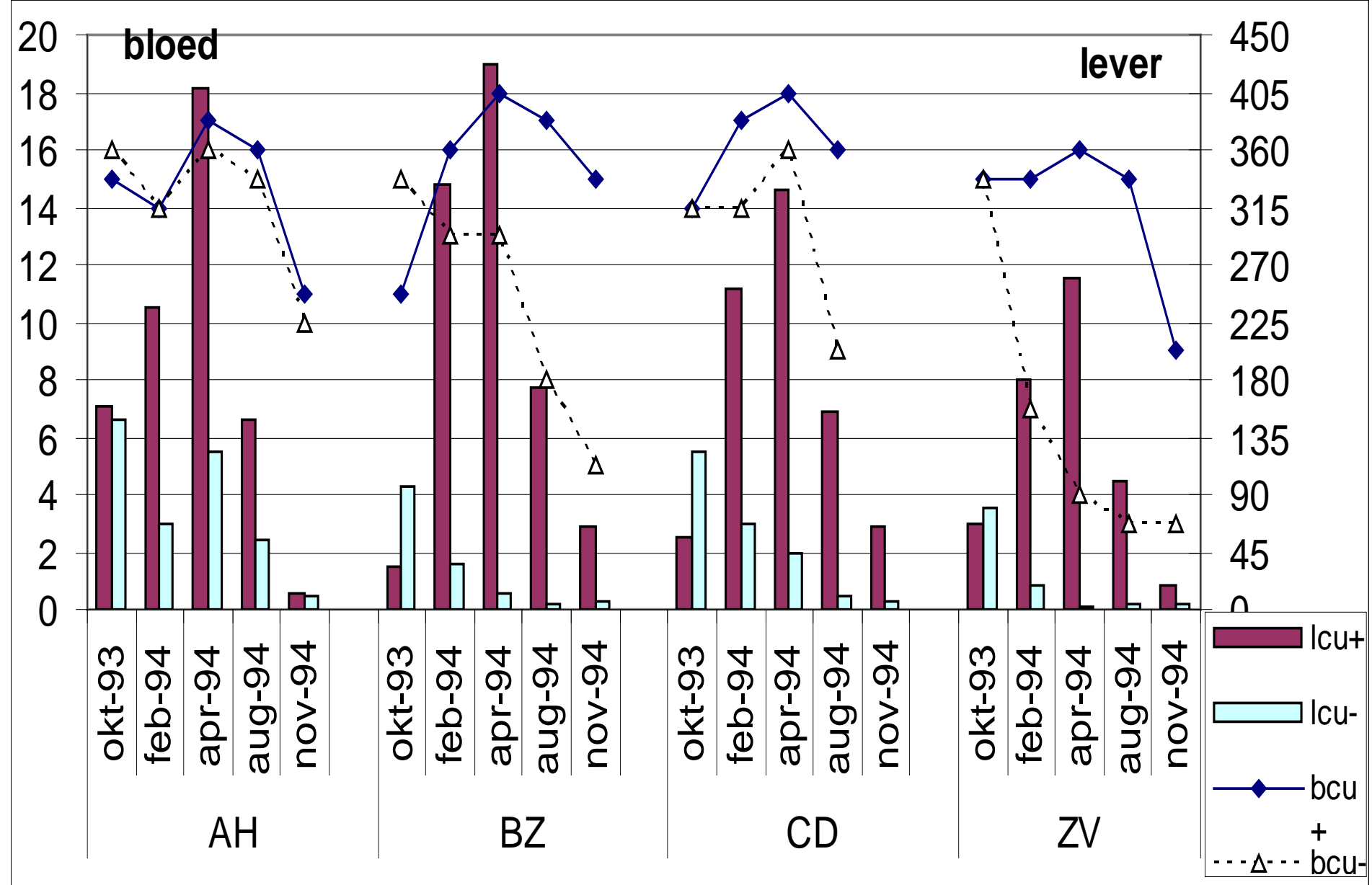
- **‘Dynamic self-regulation’ towards equilibrium (as much as possible)**
- **Ability of a system to REGAIN BALANCE after shock or any other influence**

# The cow's capacity to adapt ...

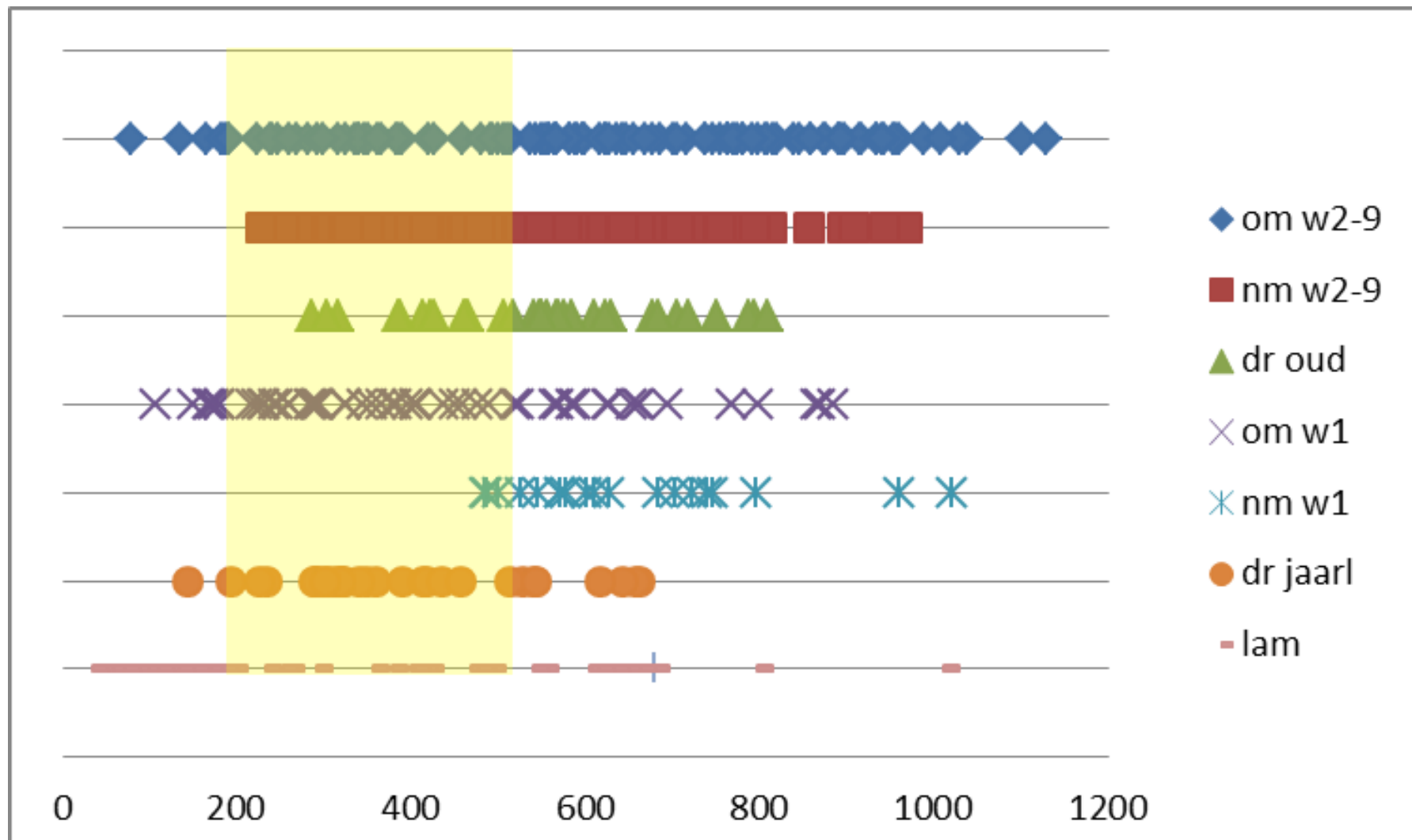
- **When lacking protein and energy =>**
  - lower milk yield, less weight gain / weight loss
- **When lacking minerals =>**
  - Impact on fundamental life functions
  - Lower milk yield / weight loss NOT 'first response'
- **Deficiency =>**
  - First response:  
use reserves and 'pools'
  - Next: symptoms
- **When too much (and not just 'washed out') =>**
  - Store to the limit
  - Next: symptoms



# Cupper content – liver and blood

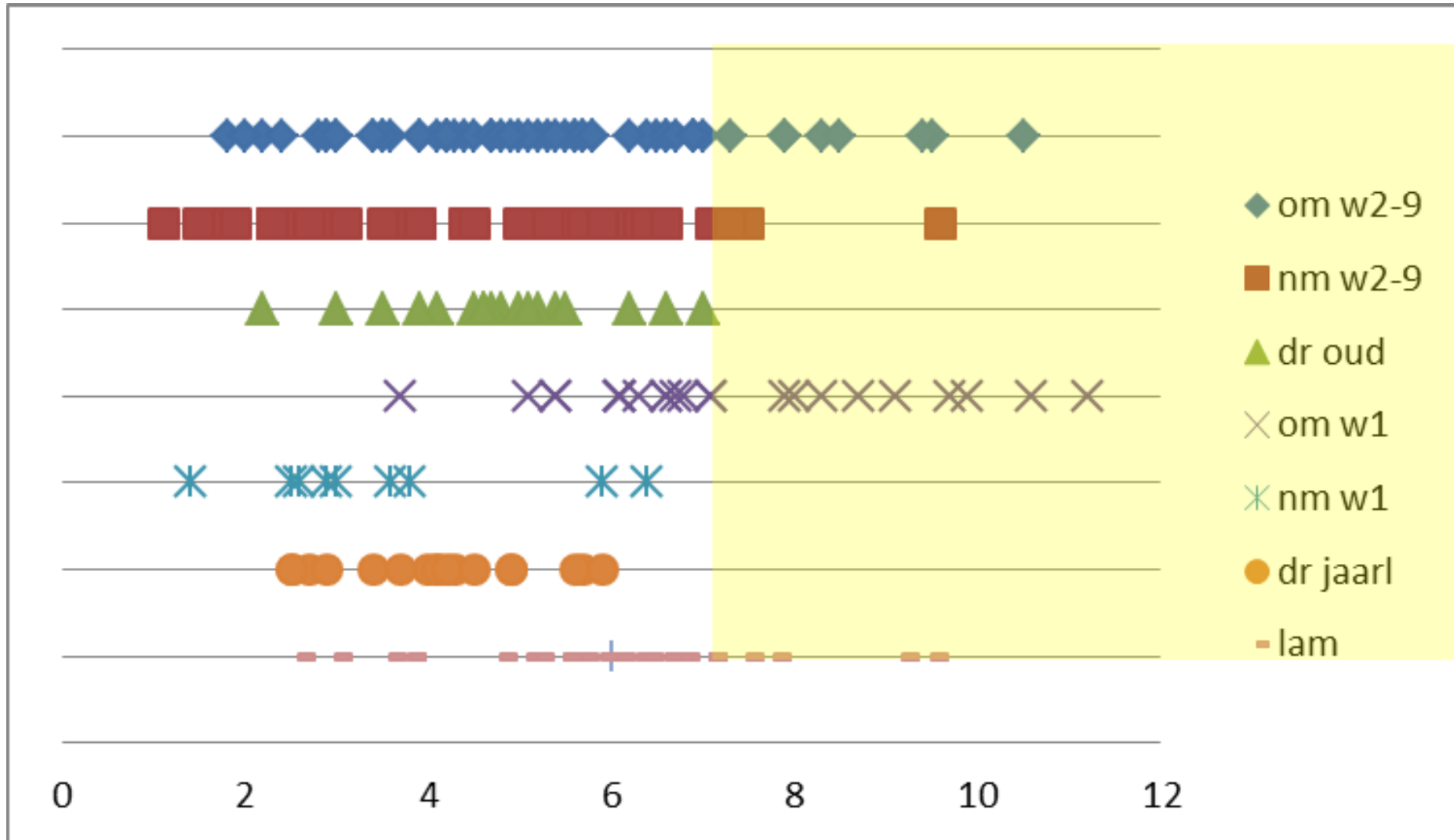


# Selenium in blood per group

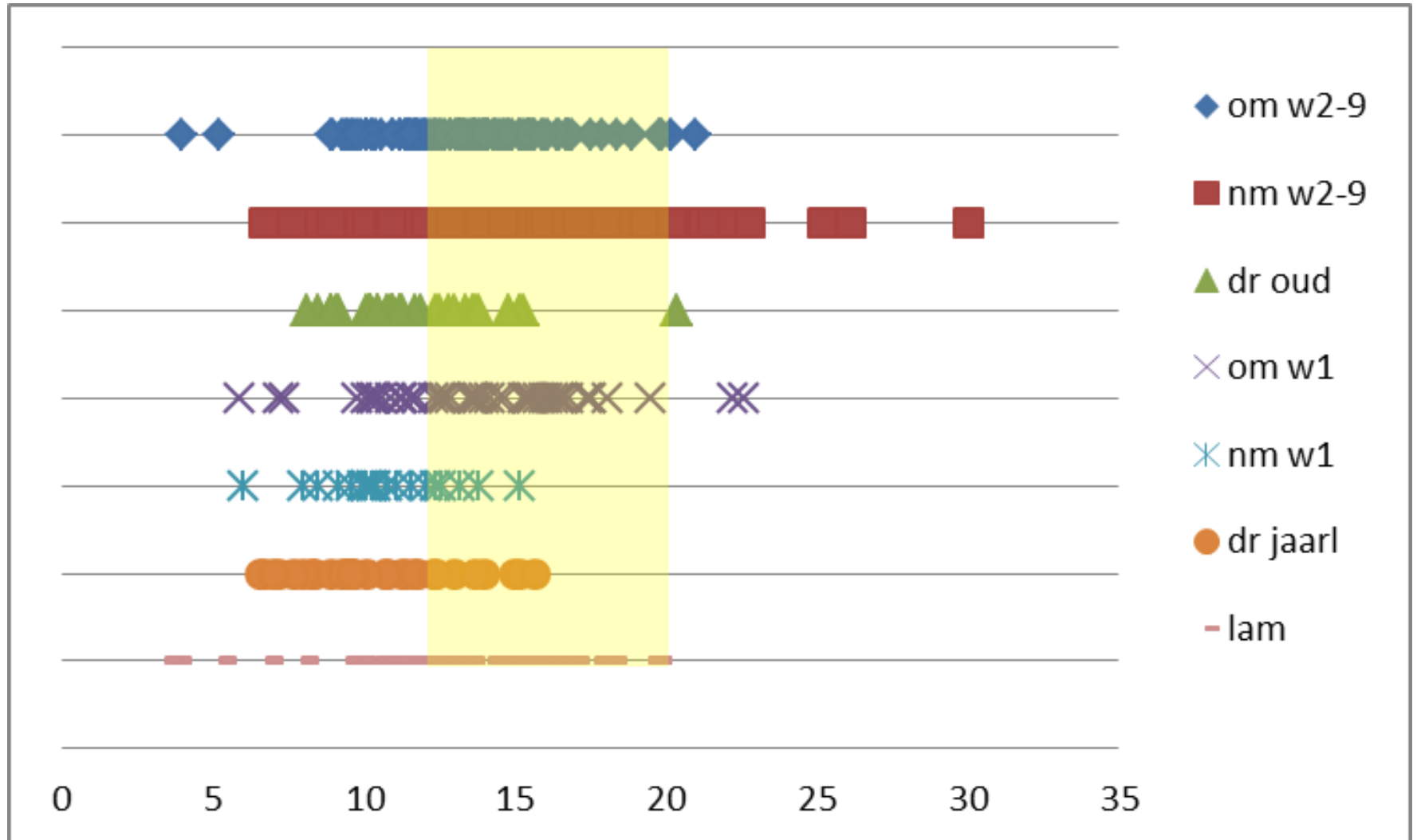




# Vitamin E in blood per group



# Copper in blood per group



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# 'Natural'

# Natural feed?



# **‘Is it desirable to rely on ‘natural feed?’**

- **Based on the organic principles: yes, certainly! MINERALS SOMETIMES MOBILISED EASY/EASIER FROM ORGANIC SOURCES. ANIMALS HAVE AN ABILITY TO ADAPT AND COPE. THEY CAN STORE AND USE RESERVES – BUT:**
- **How ‘natural’ is the lives, growth and yield of dairy cattle?**
- **Balance...! Fair chance to the animal!**

## **Are herbs an option?**

- **Ruminants love herbs!**
- **Gives variation to the diet – lots of micro nutrients and minerals, taste,**
- **So far no documented general effect on health and welfare**
- **We need to know more about it!**



## **‘Herb advice’**

- **Ruminants love them! Both in grass, hay and silage.**
- **If sowing them: sow them in stripes – easier to re-sow next year in established grass fields.**
- **Choose the ‘easy ones’: avoid those with very bad survival rate**
- **‘Self-sown herbs’ / plants can potentially also give good minerals & vitamins ...**





**Combine it with other qualities of  
cow lives:  
taste and senses, natural diversity ...**



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# Give animals fair chances

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- **Balance!**
- **Remember the ‘imbalance per definition’ in many dairy herds ...**
- **Including the balance between ‘natural’ and ‘care!’**



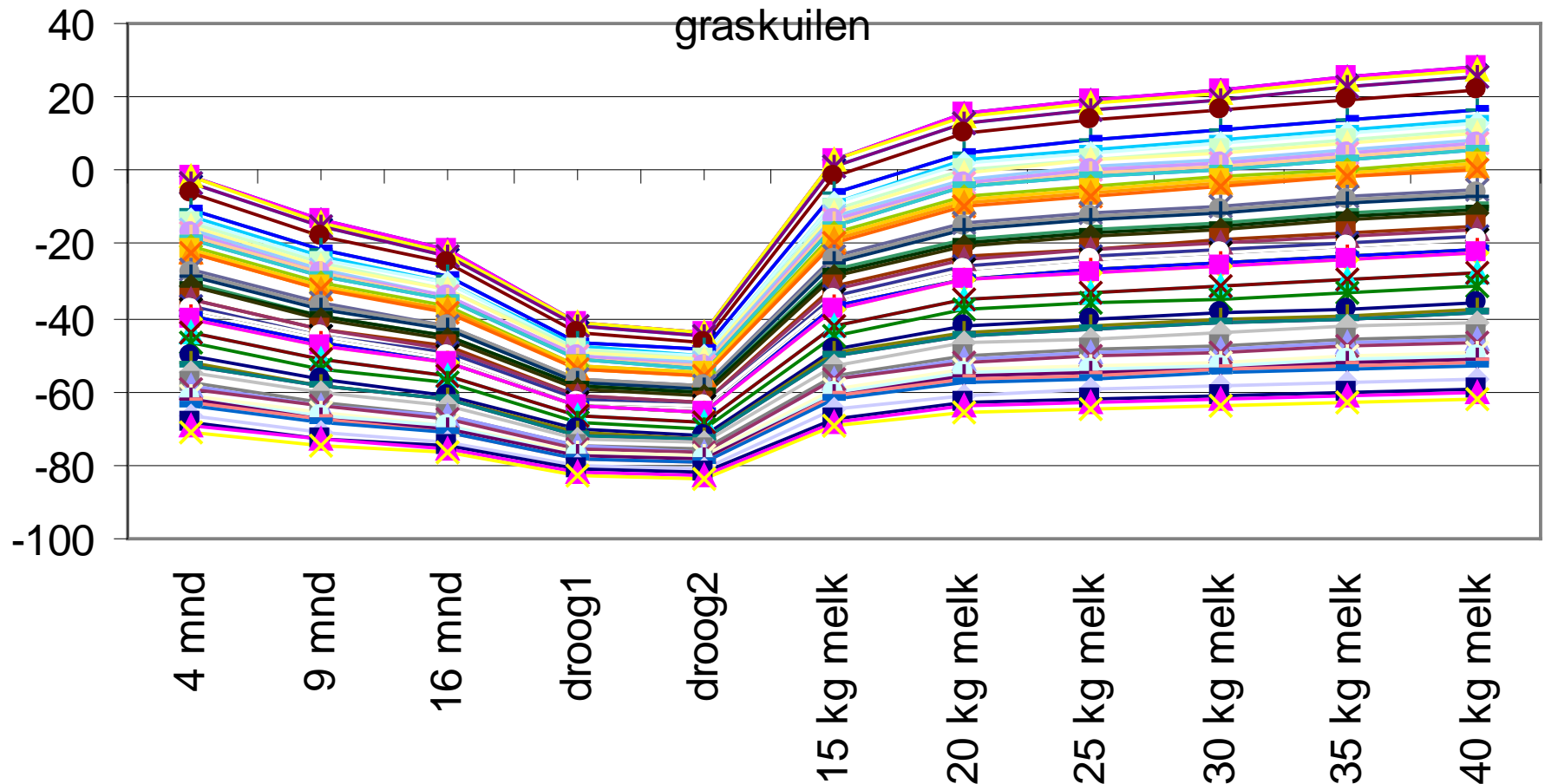
# **‘Feed naturally’ ... with care ...**

- **Know the content! Get feed analysed! Improve knowledge!**
- **Know symptoms of deficiency and keep a close monitoring of the animals**
- **Plan the feeding and diet carefully: diversified and including e.g. relevant herbs**
- **Always stepwise changes and close monitoring**
- **Supplement when necessary**
- **Remember: animals have an ability to adapt and cope and have reserves – but continuous deficiency => undersupply and eventually symptoms.**
- **Don't overfeed with what they can't get rid of!**



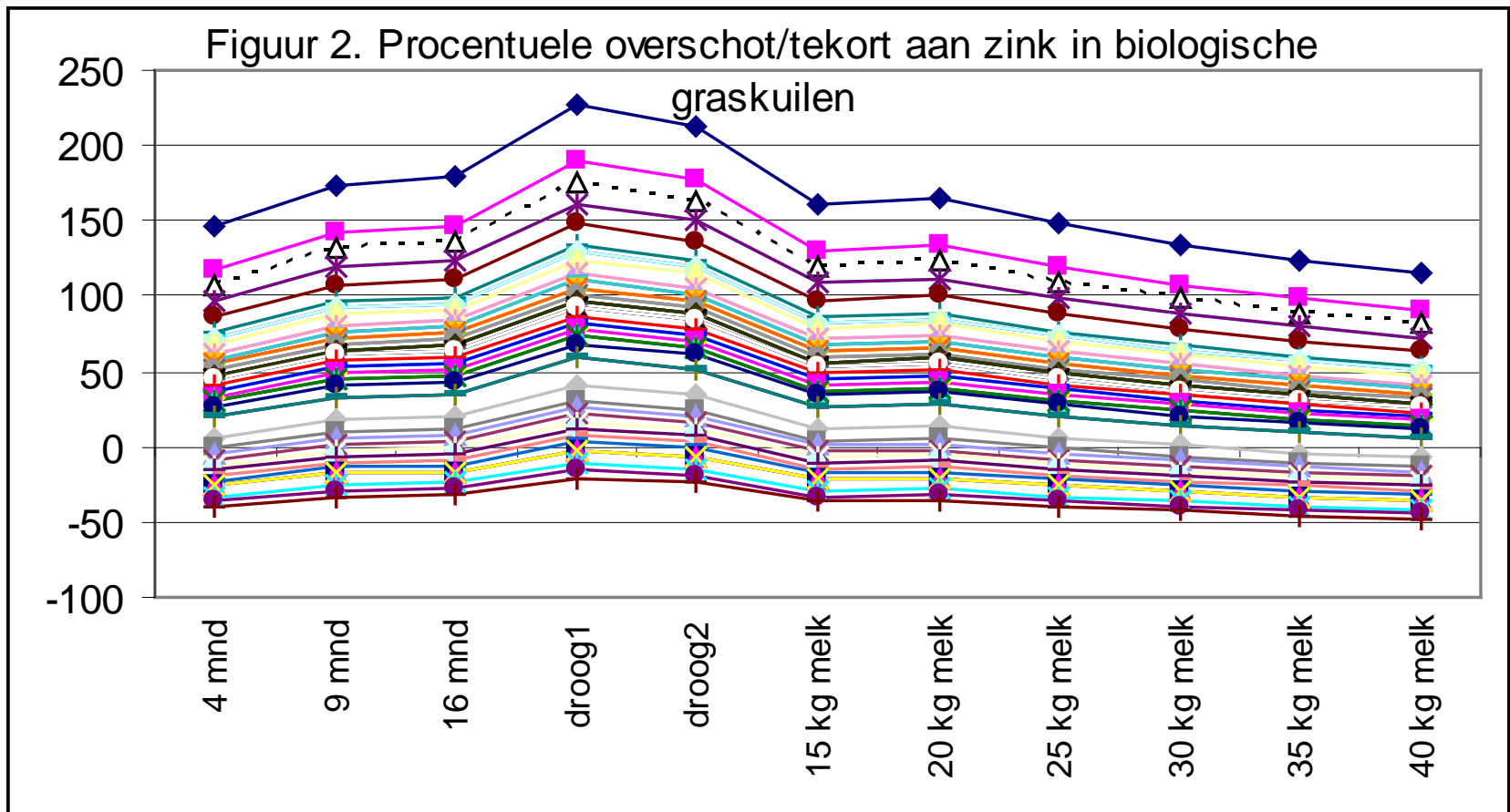
# Examples of copper: are animals covered from eating organic silage (due to conventional standards)?

Figuur 1. Procentueel overschot/tekort aan koper bij biologische graskuilen

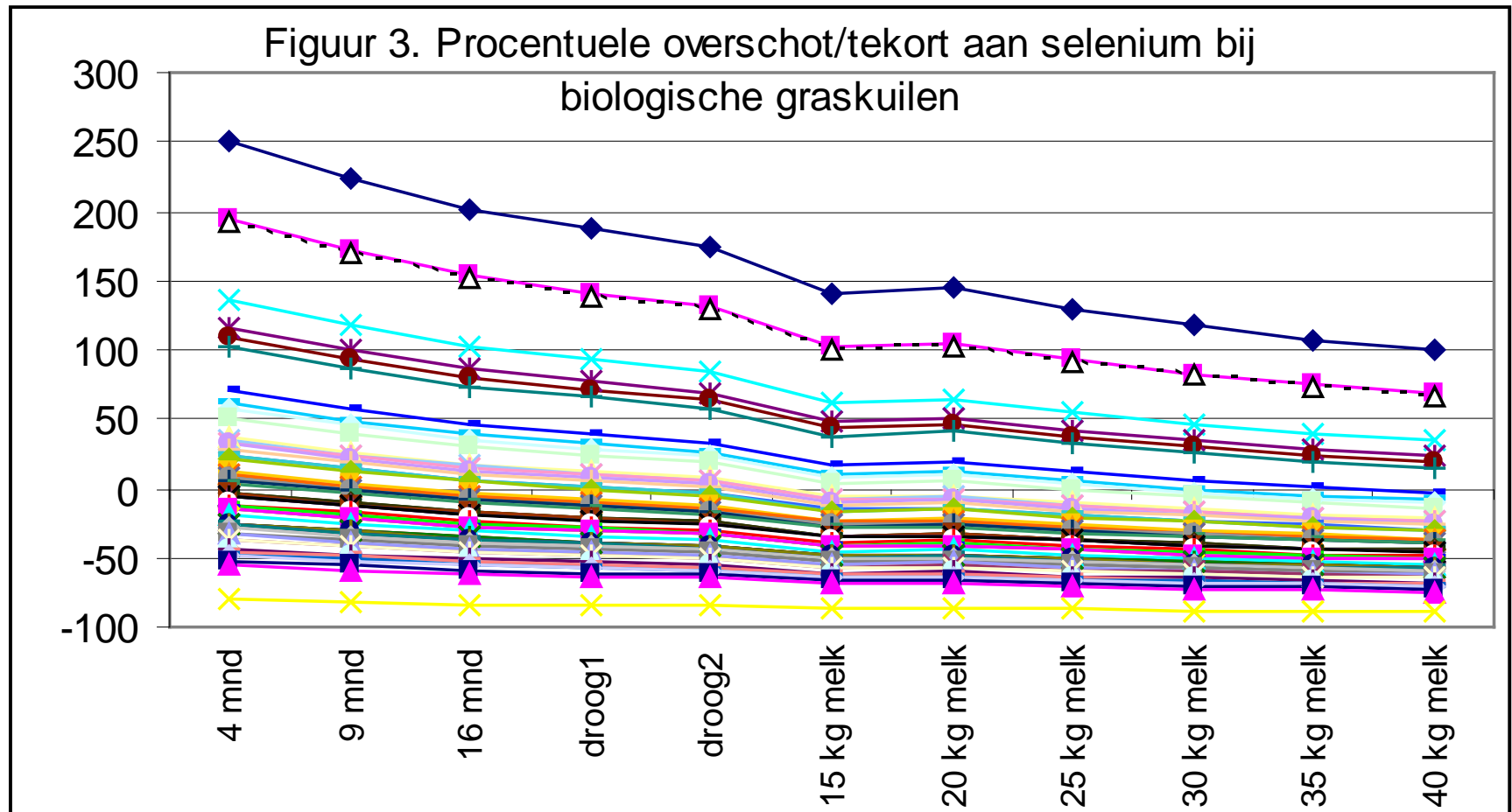




**Zn: most groups of cattle were well covered ('normal standards') from eating organic grass / forage based diet**



# Selenium: drained when yielding



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# Monitor and 'care'

# **‘The alliance’ between farmer and animals in organic farming:**

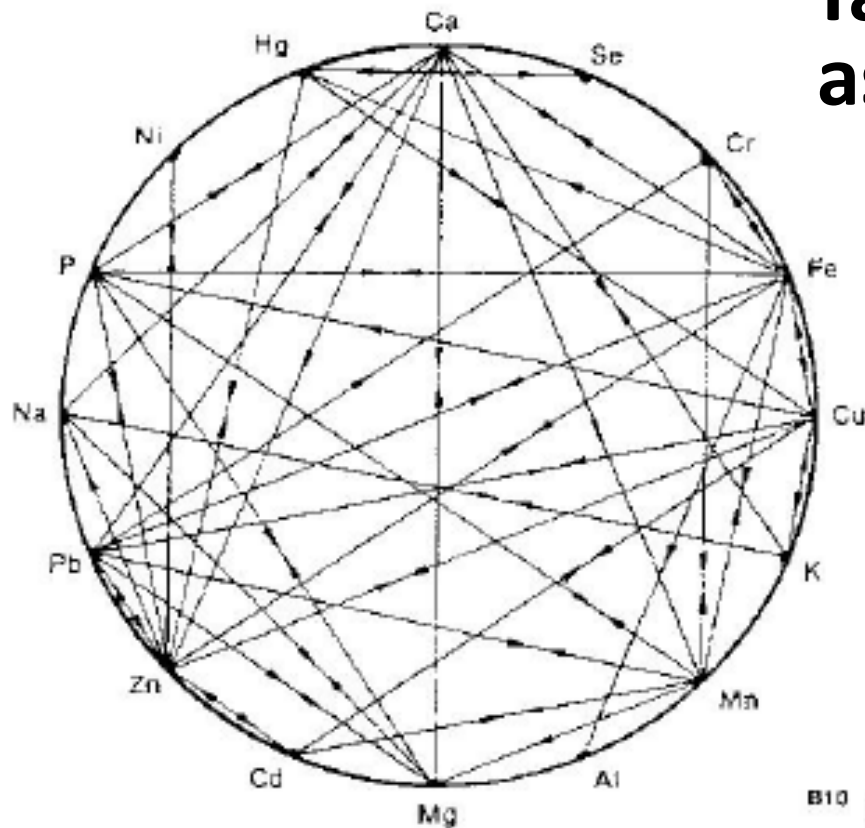
**Allow ‘naturalness’ under close supervision ...**



**... and intervene consequently and immediate when needed**

# Knowledge: Minerals interact ...


**Figure 1**  
**Mineral Antagonists**



**Take useful samples ...  
ask the real experts ...**





A brown cow is grazing in a field of tall green grass. The cow is positioned in the lower half of the frame, partially obscured by the grass. The background is a dense forest of green trees and foliage.

**Get farm specific knowledge  
about feed and how the  
animals are doing ...**

**Research gaps on 'natural feed' ...**



The background of the slide is a lush, close-up photograph of a flowering plant. It features numerous green stems with small, oval-shaped leaves. Interspersed among the foliage are several tall, slender spikes of small, vibrant purple flowers. The lighting is bright and natural, creating a soft, slightly blurred effect in the background, which emphasizes the sharp details of the leaves and flowers in the foreground.

**Thank you for your attention ... and  
constructive supplementing points**

**...**