

# What can regenerative agriculture deliver for farmers?

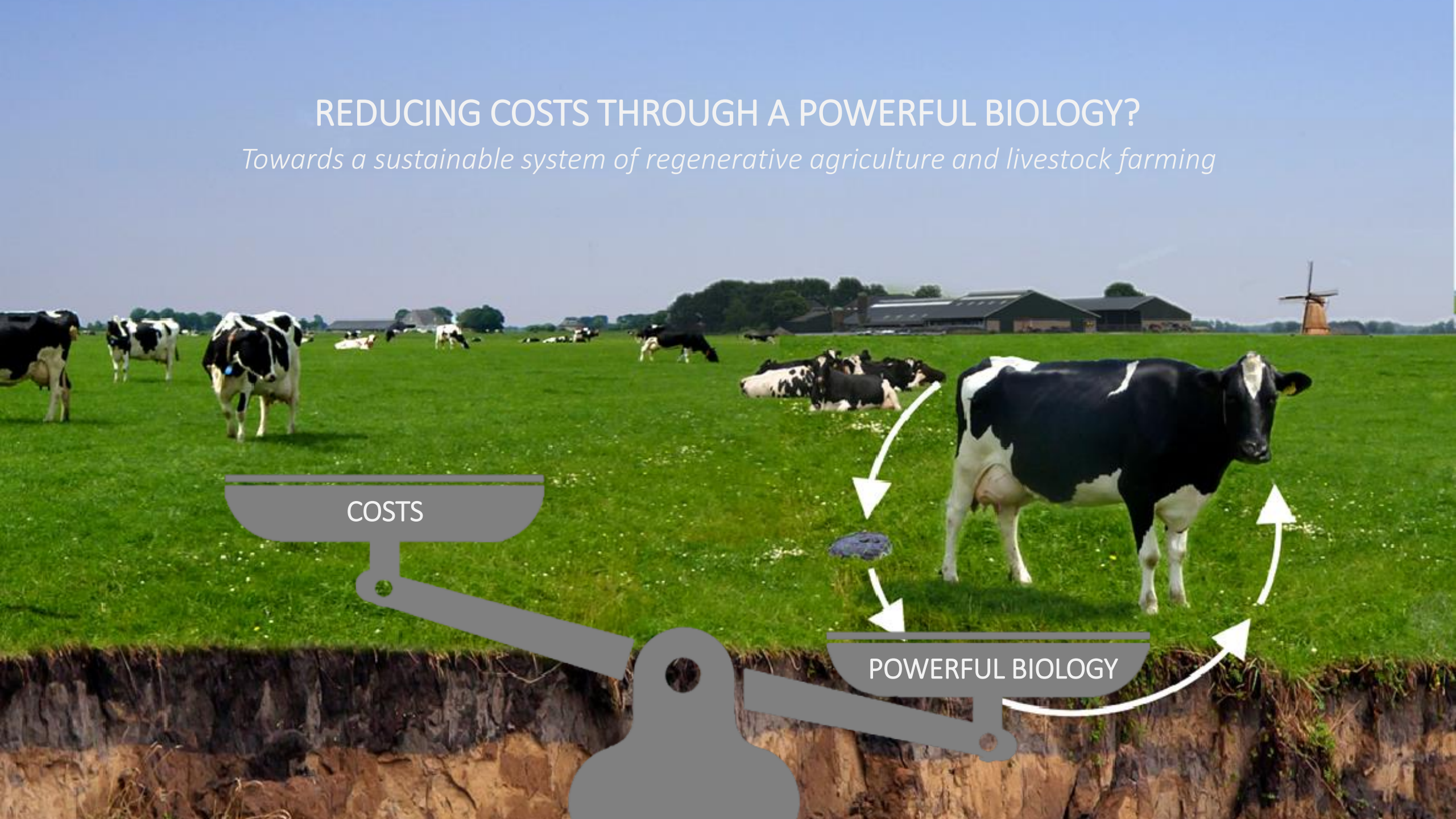
*Peter Vanhoof*

*Advisor at Organic Forest Polska*



# REDUCING COSTS THROUGH A POWERFUL BIOLOGY?

*Towards a sustainable system of regenerative agriculture and livestock farming*



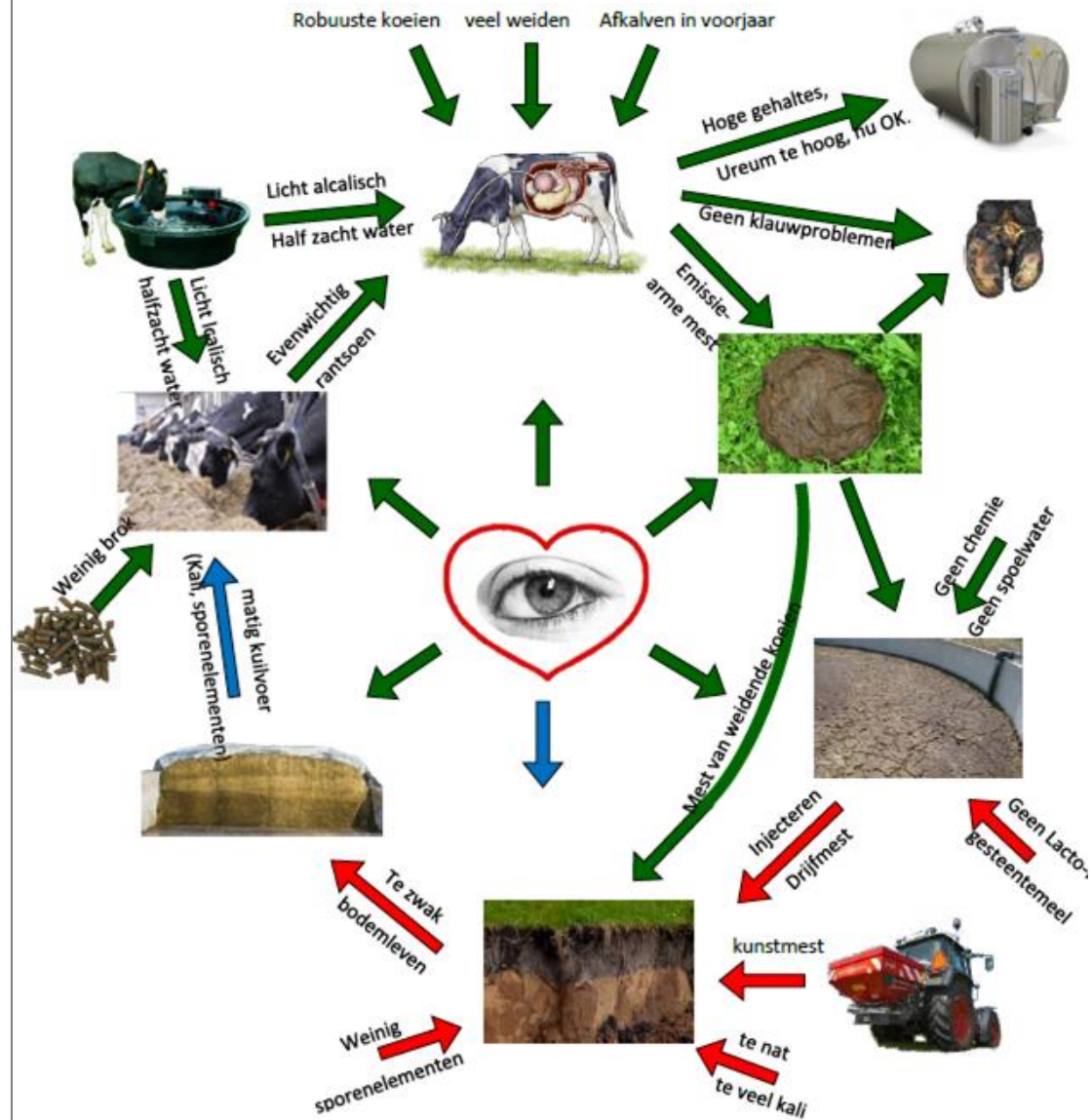
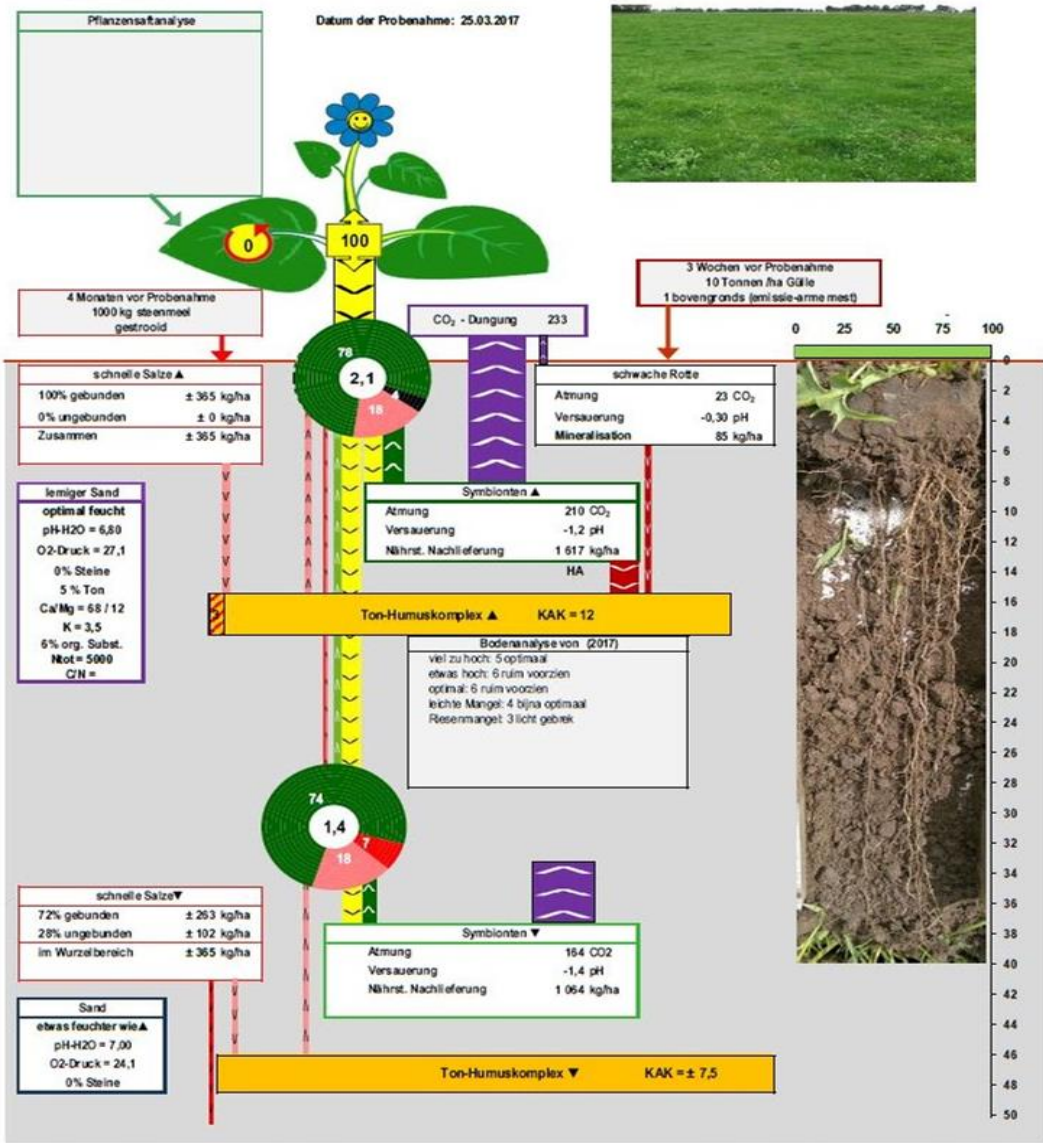
COSTS

POWERFUL BIOLOGY









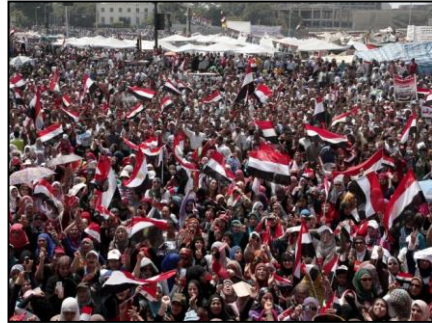
Chemical analysis  
= determination of the quantity of building  
materials





# What kind of life / conditions do we need?

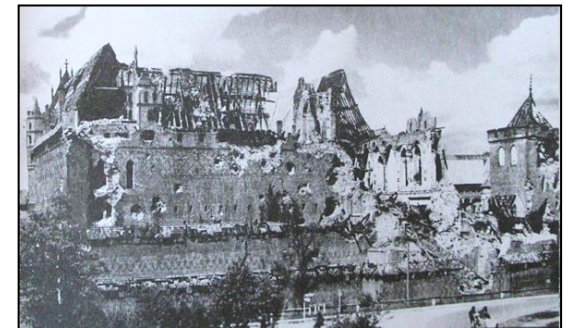
quantity of life

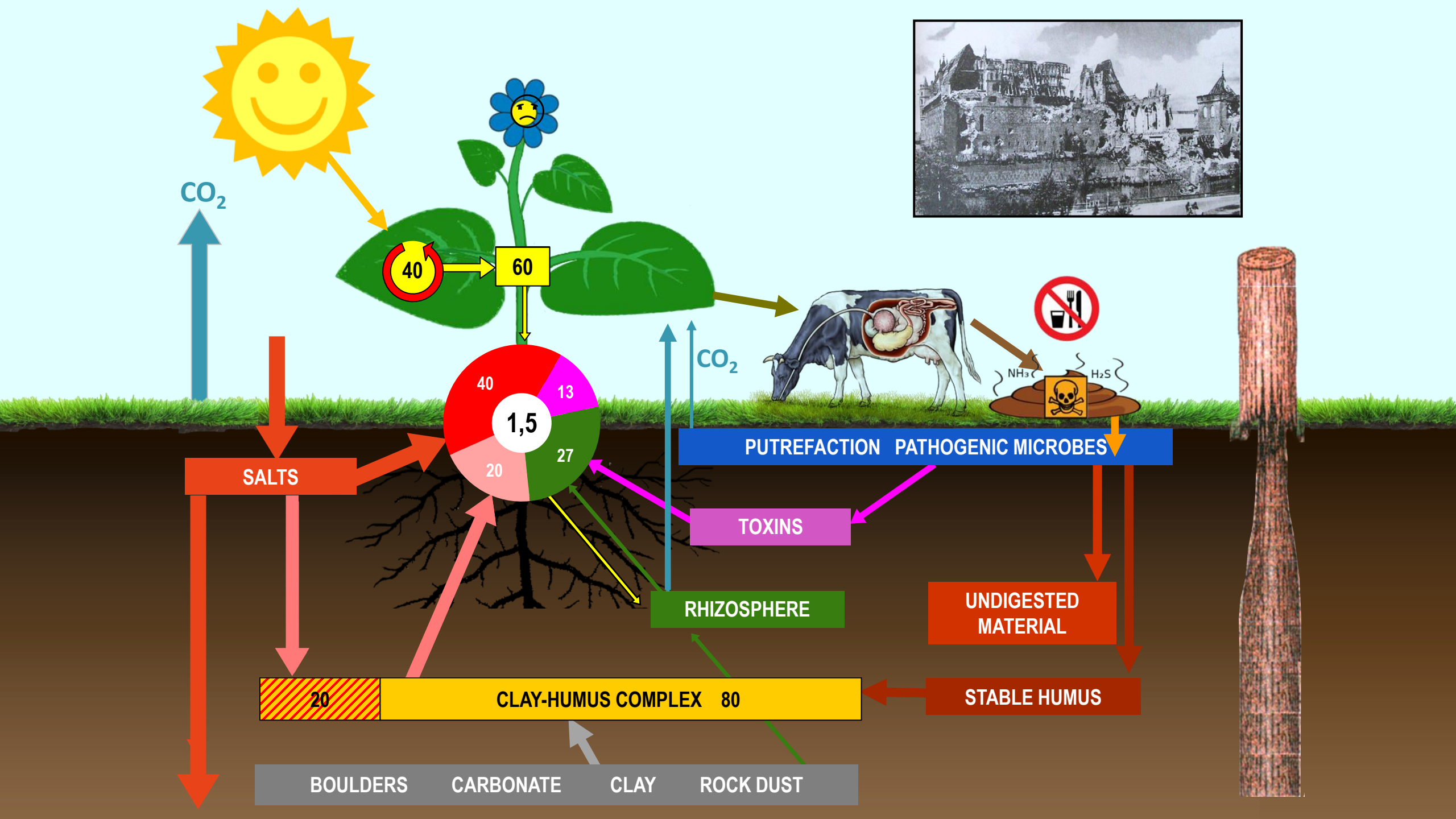


quality of life

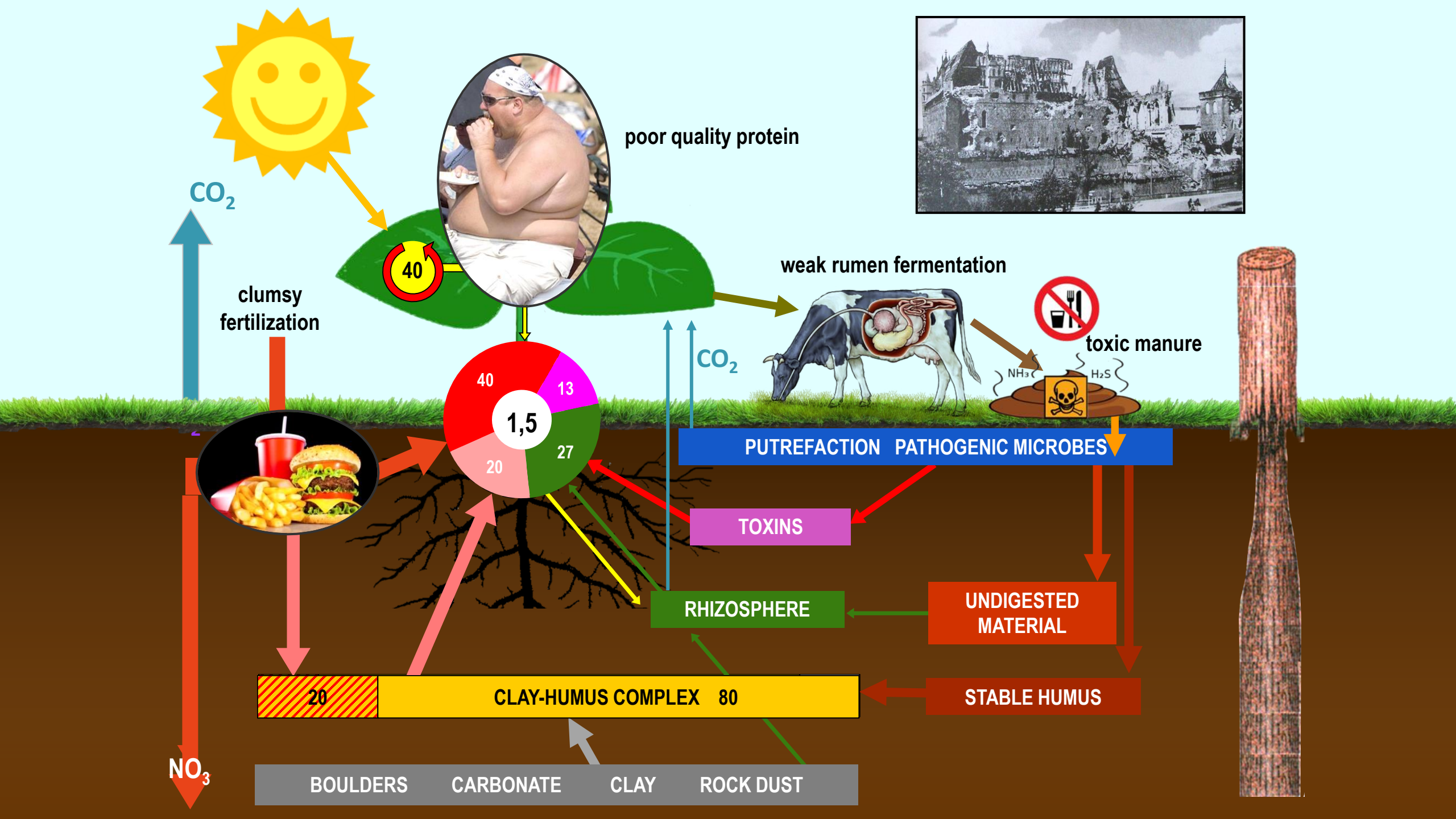


a place to live



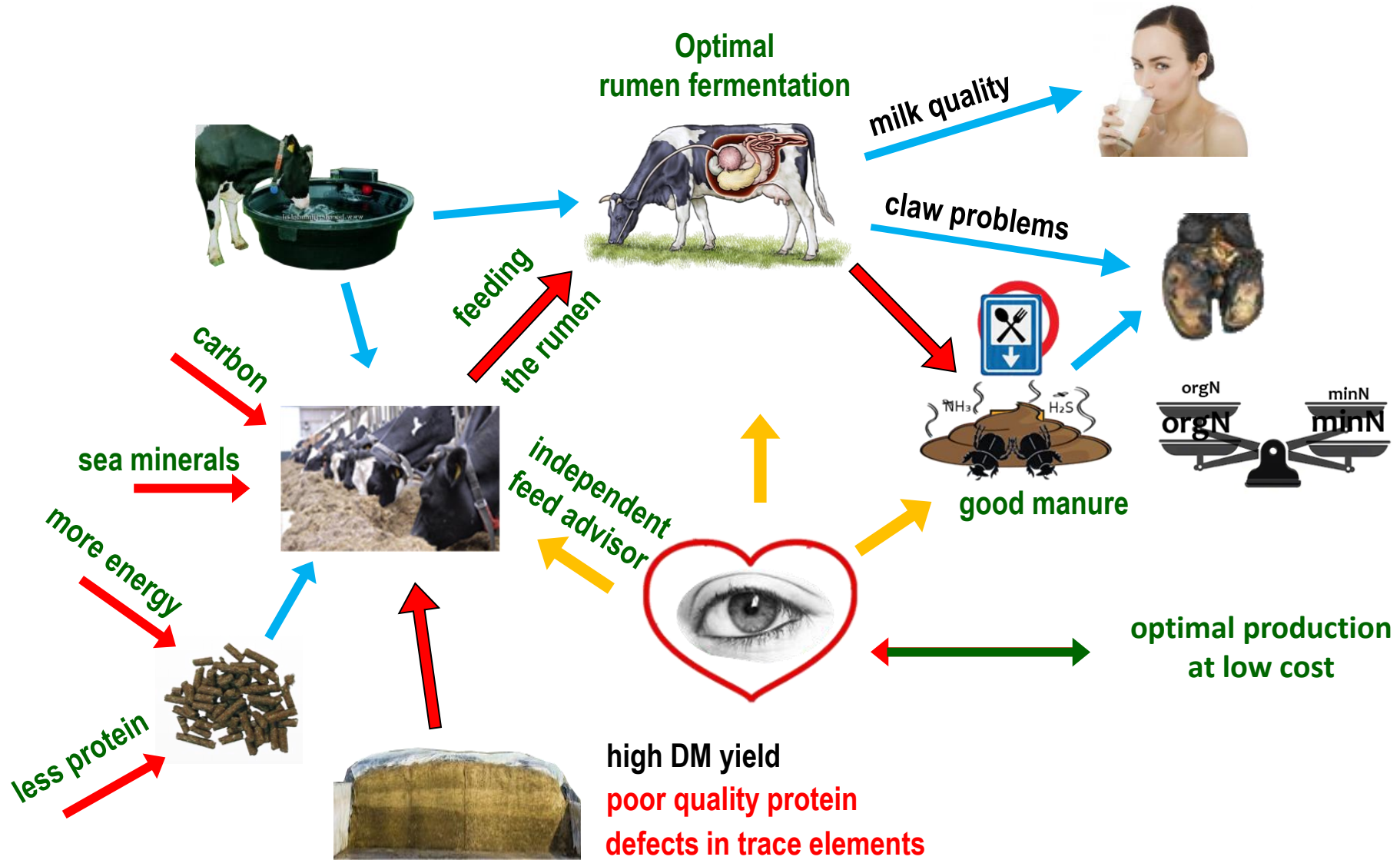






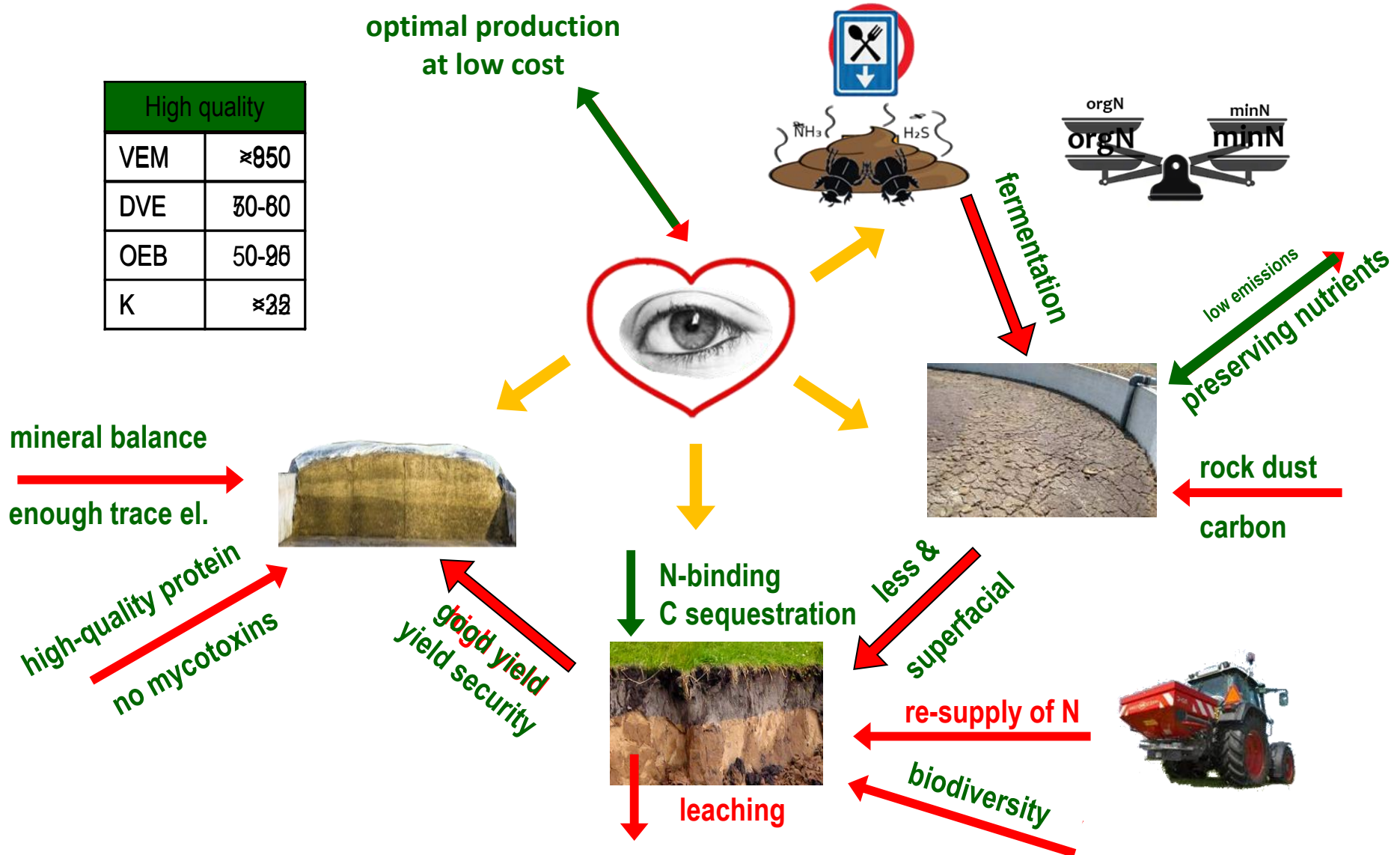


# SHORT-TERM APPROACH



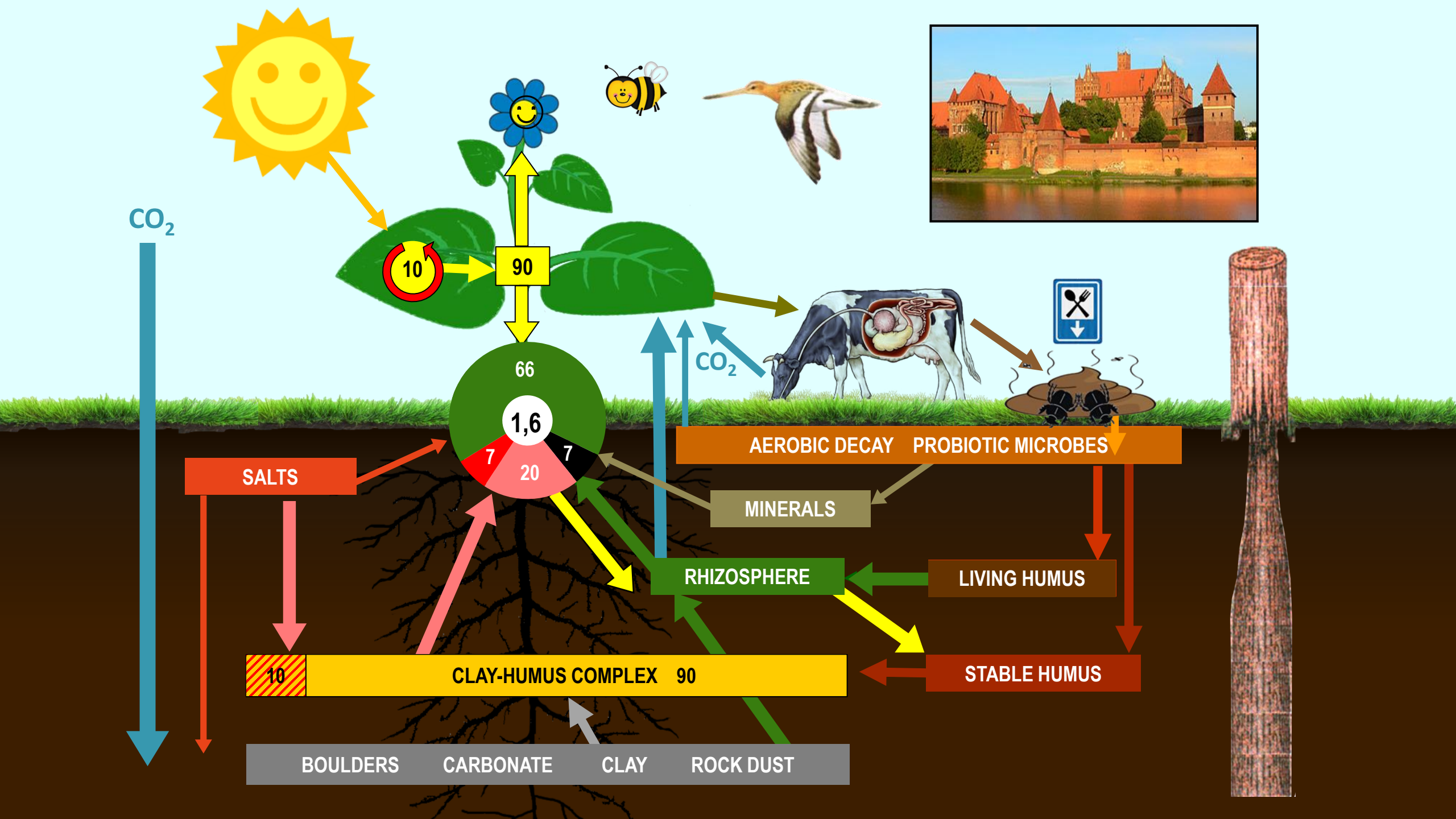
# LONGER-TERM APPROACH

High quality	
VEM	≈850
DVE	30-80
OEB	50-96
K	≈22











Feature Review

# The decline of plant mineral nutrition under rising CO<sub>2</sub>: physiological and molecular aspects of a bad deal

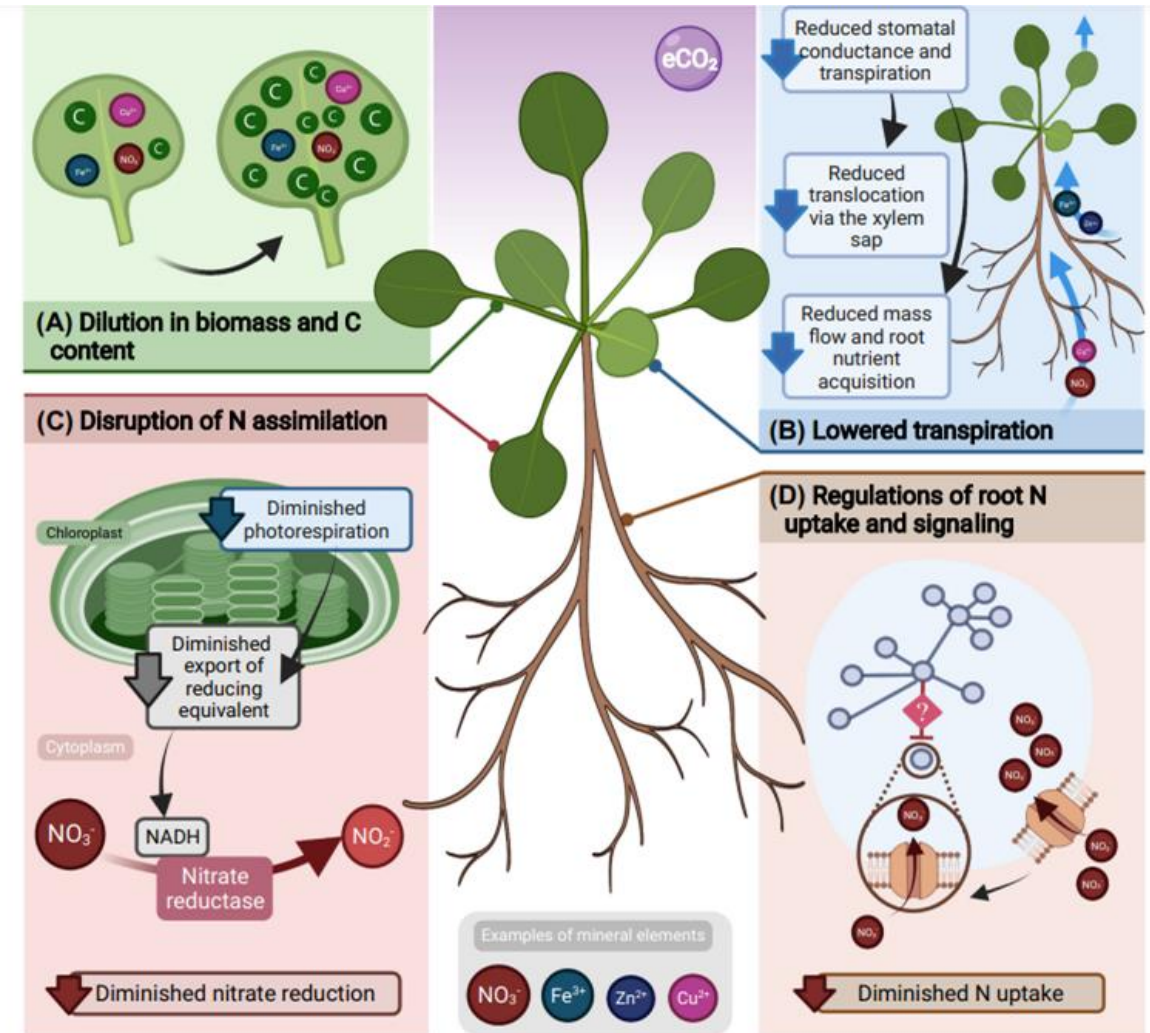
Alain Gojon,<sup>1</sup> Océane Cassan,<sup>1</sup> Liên Bach,<sup>1</sup> Laurence Lejay,<sup>1</sup> and Antoine Martin<sup>1,\*</sup>

The elevation of atmospheric CO<sub>2</sub> concentration has a strong impact on the physiology of C3 plants, far beyond photosynthesis and C metabolism. In particular, it reduces the concentrations of most mineral nutrients in plant tissues, posing major threats on crop quality, nutrient cycles, and carbon sinks in terrestrial agro-ecosystems. The causes of the detrimental effect of high CO<sub>2</sub> levels on plant mineral status are not understood. We provide an update on the main hypotheses and review the increasing evidence that, for nitrogen, this detrimental effect is associated with direct inhibition of key mechanisms of nitrogen uptake and

Highlights

Elevated [CO<sub>2</sub>] (eCO<sub>2</sub>) has a negative impact on key physiological mechanisms of nutrient acquisition and assimilation in C3 plants. The reasons are largely unknown.

eCO<sub>2</sub> particularly lowers nitrogen content of plants tissues, possibly through



We see the opposite in daily practice

Box 2. Genetic manipulations to improve the response of plants to eCO<sub>2</sub>

Nature & farmers don't need any genetic manipulations

Box 3. Impaired N nutrition efficiency as a main cause of the acclimation of photosynthesis to eCO<sub>2</sub>

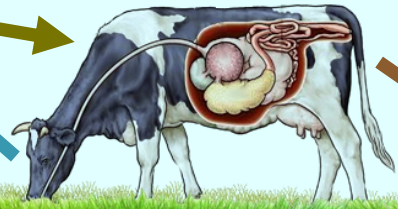
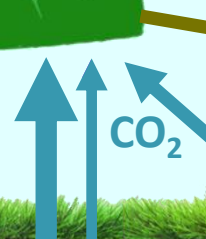
## Abstract

The elevation of atmospheric CO<sub>2</sub> concentration has a strong impact on the physiology of C3 plants, far beyond photosynthesis and C metabolism. In particular, it reduces the concentrations of most mineral nutrients in plant tissues, posing major threats on crop quality, nutrient cycles, and carbon sinks in terrestrial agro-ecosystems. The causes of the detrimental effect of high CO<sub>2</sub> levels on plant mineral status are not understood. We provide an update on the main hypotheses and review the increasing evidence that, for nitrogen, this detrimental effect is associated with direct inhibition of key mechanisms of nitrogen uptake and

scientists/policy makers should work together with farmers (= experts by experience)



Hoge kwaliteit	
VEM	>950
DVE	70-80
OEB	0-10
K	<25



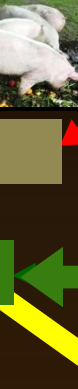
S



10 CLAY-HUMUS COMPLEX 90

STABLE HUMUS

BOULDERS CARBONATE CLAY ROCK DUST





# Research in 2019 on 135 dairy farms

*Together to a system of regenerative agriculture and livestock farming*

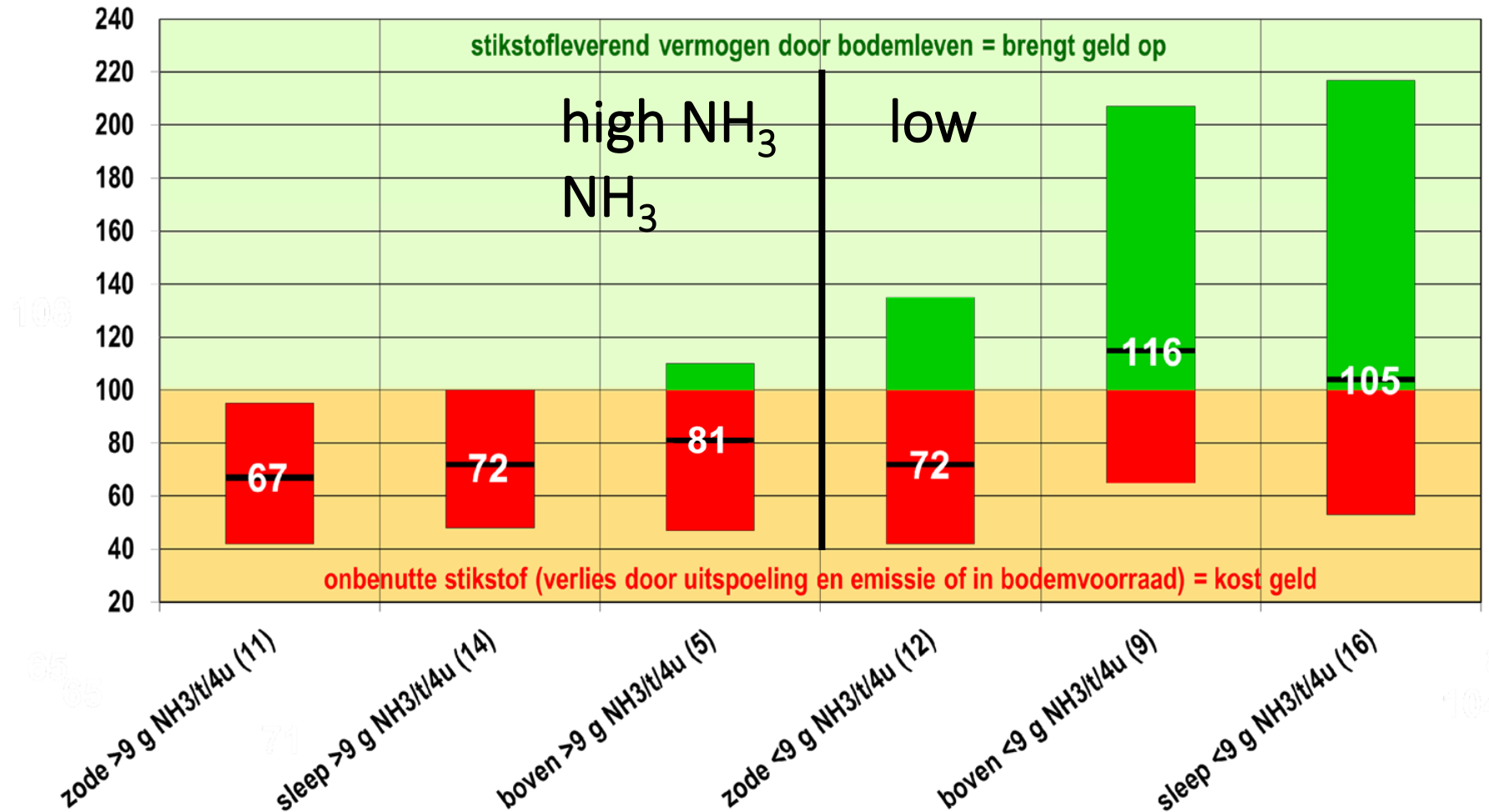




# -13 emissions and way of fertilising

high-emission manure always gives poor efficiency  
 low-emission manure is clearly less efficient when injected

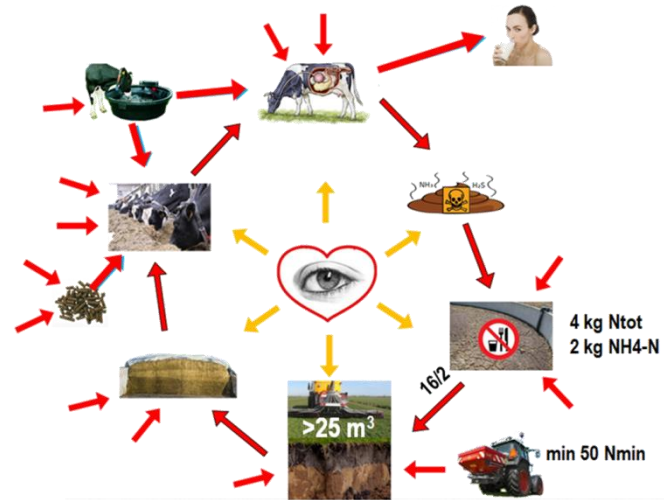
% N efficiency



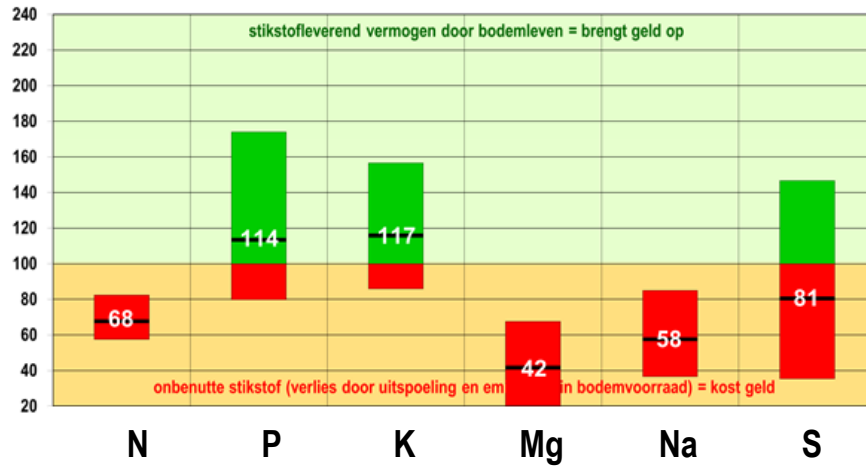




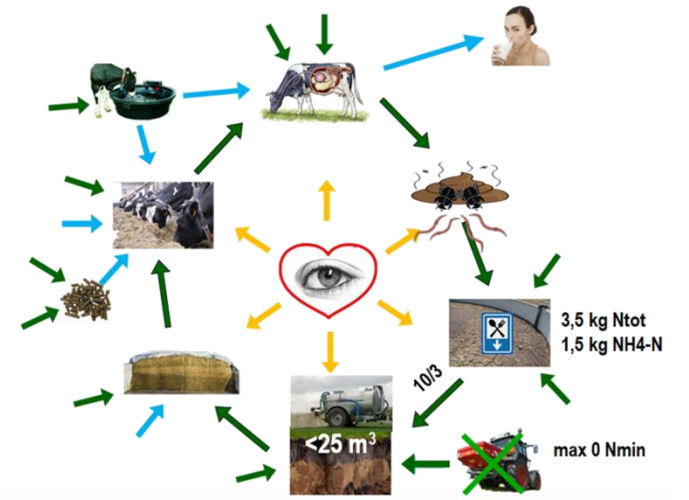
# conventional



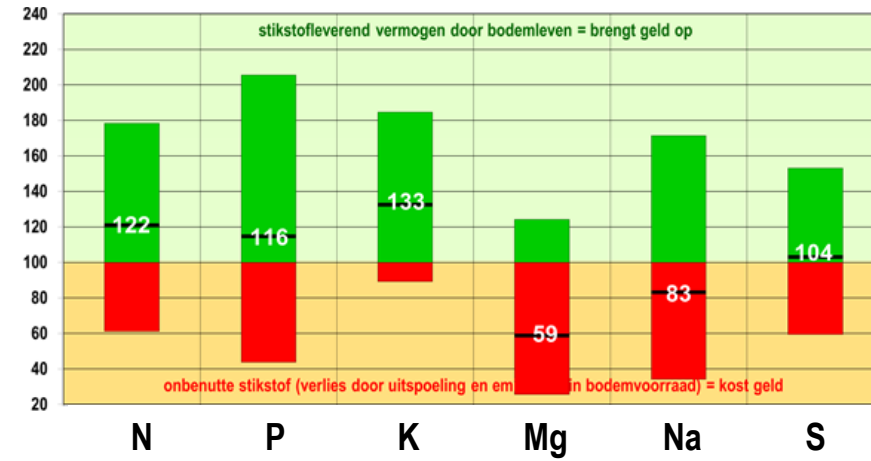
% N efficiency



# regenerative



% N efficiency





# N-efficiency and rootdepth





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*Towards a sustainable system of regenerative agriculture and livestock farming*



COSTS

Organic Forest

[www.organic-forest.eu](http://www.organic-forest.eu)

POWERFUL BIOLOGY





Questions?