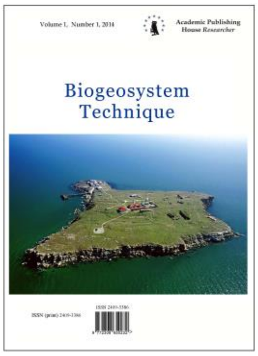
Published in the Slovak Republic
Biogeosystem Technique
Has been issued since 2014.
E-ISSN: 2413-7316
2018, 5(2): 213-228

DOI: 10.13187/bgt.2018.2.213
www.ejournal19.com



Re-inventing Agriculture!

Anton O. Nigten [a, *]

[a] Salt of the Earth, Wageningen, The Netherlands

Abstract

During the last 200 years the idea became paramount that crops grow well on inorganic artificial fertilizers. After World War two there was a high pressure in the USA and Western Europe to stop investigating other forms of plant feeding. At the end of the 19th century there was the controversy between Béchamp and Pasteur about microbes. Béchamp defended the idea that the circumstances create diseases in plants and animals, and Pasteur was of the opinion that it was mere accident. Pasteur won, but not on scientific grounds. During these 200 years the debate never stopped completely. Inorganic fertilizing with a strong focus on nitrogen, potassium and phosphor led to crops which were more and more out of balance. A reaction was unavoidable. Many scientists concentrated their efforts on the risks of unbalanced crops. Especially for cattle. But only few scientists translated these findings into the risks for humans. Other groups found out that the ideas of Pasteur on microbes were incorrect. Microbes attack higher organisms when the macro elements are not in balance and nitrogen is not converted into proteins.

In this paper I tried to investigate the risks of the dominant paradigm in the science of feed and nutrition with regard to fertilizing and health. I developed optimal rations for the macro elements potassium, sodium, calcium, magnesium and phosphor. And with these optimal ratios we can see where things go wrong. Through the quality of the feed and fodder the quality of the milk has gone down, and the risk of mastitis has gone up, and important crops like potatoes, tomatoes and fruits are not in balance and have lost their natural resistance, their qualities and their taste. As a consequence in many countries people don't get enough magnesium – the key element for staying healthy. In most of the food research the role of magnesium is completely ignored.

The second line is about the role of the microbes in health and disease. The recent research regarding the role of viroids in our cells starts where the work of Béchamp ended. Only a small group of scientists continued finding out about the role of microbes smaller than bacteria. There was a special focus on their role in cancer. But with the recent findings of Pradeu and his colleagues about their role in supporting our health the focus is back on their unmissable role in the health of plants, animals and men. The main question is when and why these symbiontic viroids stop being symbiontic and start being pathogenic. The balanced minerals and trace elements are the main clue.

Keywords: agriculture, protein, fertilizers, pesticides, human health.

1. Introduction

In the twentieth century, after World War Two, modern agriculture based on NPK salts and liming for pH became the dominant practise in many countries (Visser, 2010). The idea was that high yields with the help of nitrate, ammonium, potassium and phosphor salts, and regular liming

* Corresponding author
E-mail addresses: aonigten@hotmail.com (A.O. Nigten)

was the best and only solution to feed the fast growing World population. In the beginning it seemed a hopefull and good solution. Yields went up. But very soon it became clear that we had to pay a price that became higher and higher: the growing need for more and more pesticides; the necessity to use more and more artifical fertilizers for the same yields; the loss of many traditional animal and plant varieties; damage to local and regional ecosystems; a strong need for fossile energy to produce the artificial fertilizers and pesticides; imbalance of the nutrients in food and feed, grown with artificial fertilizers and/or low quality composts and animal dungs; less and less trace elements in food and feed; loss of water holding capacity and loss of organic matter in the soils; soil erosion; salinisation and sodification of land; loss of biodiversity in and outside agriculture.

But what to do? Improve the quality of the inorganic fertilizers? Combine them with more carbon in order to get higher levels of organic matter in the soils? Extra composts? Only composts and/or animal dung? Select special mixes of microbes in order to restore the loss of micro organisms in the top soil, as Bayer does?

In my view this is not enough! Or better, it doesn't solve the problem, because the basis is wrong. We should not feed our crops solely with salts. We need in fact a new paradigm for the feeding of our crops, and with them the feeding of animals and men. At least part of the plantfoods must be living food and organic food.

2. Current results, discussion and outlines of a new paradigm concerning fertilizing and health

In nature plants feed themselves. Or better: plants feed themselves with the help of countless and for the biggest part unknown micro-organisms. We know about their symbiosis. We have rough ideas about how this symbiosis works. But no more than that. We know only 3–5 % of all the bacteria in the World and some microbiologists say we know only 1 % of them. We know even less about archaea, viruses, viroids, bacteriophages, virophages, and biofilms (Cho et al., 2007).

And of this 1–5 % we got to know, we know almost nothing. The controversy between Béchamp and Pasteur between 1870 and 1895 about polymorphism and monomorphism of bacteria is still there, after almost 150 years of complete denial of polymorphism in the academic World, at least in Europe and the USA. The work of Béchamp (1912), Almquist (1925), Enderlein (Krämer, 2012), Naessens (1995), Russel (1890), Rusch (1968), Altenburg (1946), Schanderl (1947), Kutikhin et al. (2012), Yaghobee (2015), Kajander et al. (1998), Ciftçioğlu (2010), Cantwell (1990, 2003), Mattman (1994), Klieneberger-Nobel (1949, 1951), Livingston-Wheeler et al. (1947, 1977), Alexander-Jackson (1956), Diller (1962), Seibert (1972), and many others has made clear that there exist pleomorphic forms, bigger ánd smaller than the classic bacteria, and that they play a role in many chronic inflammations, when the symbiosis is disturbed. And especially the work of Enderlein, about whom Krämer (2012) has written her thesis, and Naessens (Bird, Naessens, 1991; Hiller, 2018; Naessens, 1995) has given us an idea about the life cycle of these pleomorphistic forms. Enderlein saw 12–16 different stages and Naessens saw also 16 different stages under the microscope – all stages from very small to very big and back again... These 'polymorphic' scientists have given many names to the smaller forms: L forms; nanobacteria; cell wall deficiënt bacteria; protids; somatids; microzyma's; viroids etc.

Naessens postulated that the small forms from stage 1–3 support the health of plants, animals and men:

"Cell division cannot take place without these busy, glowing bodies, Naessens postulated, because in the course of its cycle the somatid releases the growth hormone trephone, which enables cells to divide and multiply" (Hiller, 2018).

And he thought, like Enderlein, there is a moment in their life cycle – if they become bigger than stage 3 – that they become parasites. Many of these scientists think they are also the organisms which play a role in the origin and growth of cancer. Cancer in this view originates in the cells themselves. The same situation is for AIDS.

Rusch postulated that the tiny microbial forms develop from the bacteria and fungi after plant residuals and animal dung have been broken down by bacteria and fungi in the topsoil (Rusch, 1968). When the breakdown of plant residuals and dung is completed in autumn, winter and early spring the bacteria themselves are falling apart, and the tiniest organisms which result from this breakdown are in turn the new symbionts, the helpers of young plants when the new season starts in the spring. Rusch and others regard them as the origins of life.

The falling apart is probably the work of the bacteriophages on the mucous surfaces in the soil, comparable to the role of bacteriophages on the mucus in our intestines (Barr et al., 2013):

"In diverse metazoans, body surfaces that interact with the environment are covered by a protective layer of mucus. Because these mucus layers provide favorable habitats for bacteria, they serve as the point of entry for many pathogens and support large populations of microbial symbionts. Also present are diverse phages that prey on specific bacterial hosts. Moreover, phage concentrations in mucus are elevated relative to the surrounding environment (an average 4.4-fold increase for a diverse sample of invertebrate and vertebrate metazoans; (…). The increased concentration of lytic phage on mucosal surfaces provides a previously unrecognized metazoan immune defense affected by phage lysis of incoming bacteria (Barr et al., 2013).

The soil is in Rusch view the great cleaner. In a healthy soil all pathogens are falling apart in the end. The fertility and vitality of a good soil does not rely so much on the salts which feed the plants, but on the presence of these tiny forms, according to Rusch. Béchamp, Naessens and Livingston came, (independent from each other??), to the same conclusion: the small entities are indispensable for the higher creatures – plants, animals and men. And they live in our cells and body fluids in great numbers (Figure 1).

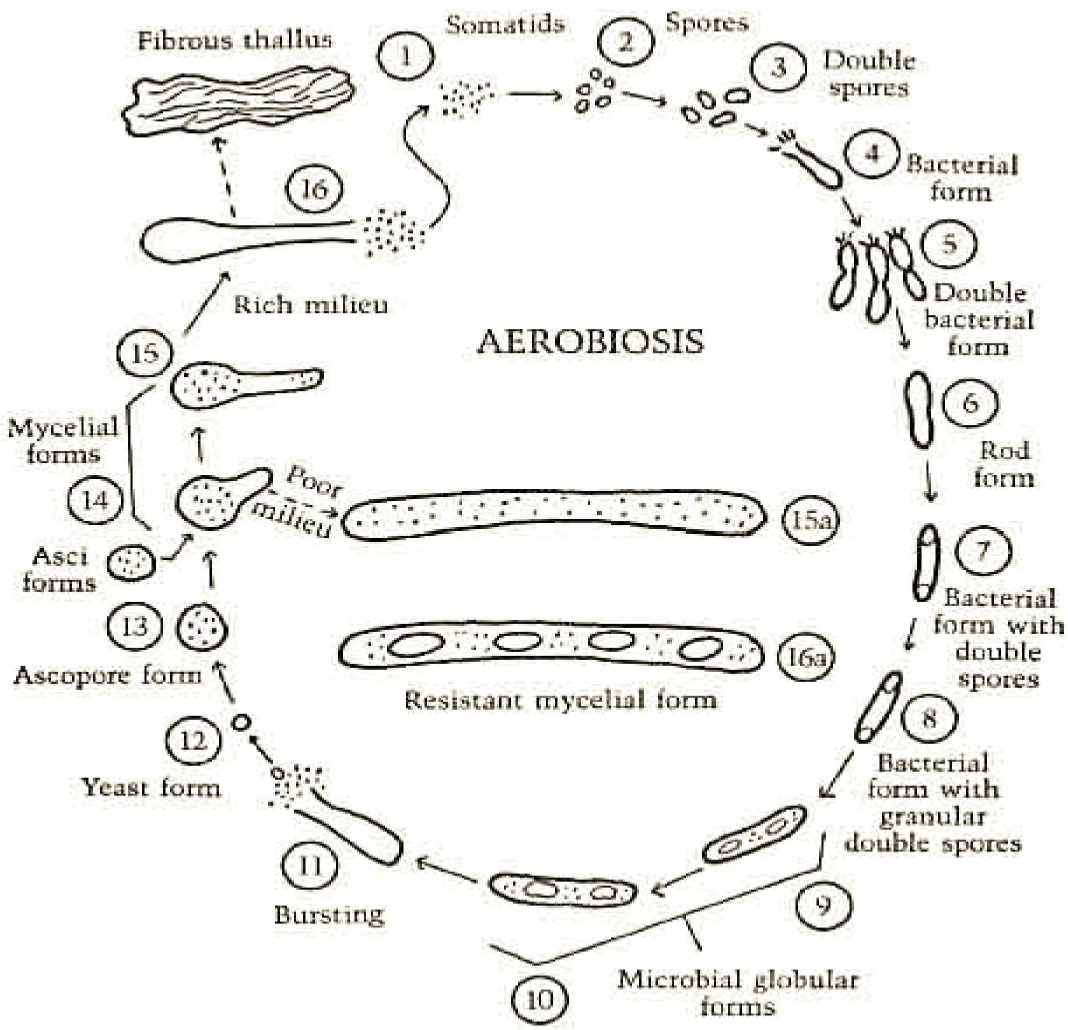


Fig. 1. The sixteen stages Naessens distinguished during microbial growth (Hiller, 2018)

At what stage they become pathogenic is not clear. Naessens has thougt after the stage three. But today we know that nanobacteria are playing a role in low grade inflammation (Çiftçioğlu, 2010). So maybe only the first stage, which Enderlein called the protids (Krämer, 2012), is a save stage.

The overview of Thomas Pradeu (2016) "Mutualistic Viruses and the Heteronomy of Life" confirms in a way these roles of viruses living in cells. One example from his overview:

"The panic grass, *Dichanthelium lanuginosum*, grows in soils that are extremely hot (>50°C). This thermal tolerance requires a mutualistic fungus, *Curvularia protuberata*. Yet, the thermal tolerance is in fact mediated by a symbiotic virus within the symbiotic Fungus".

But what about NPK and lime? What do these salts have to do with life in the soil and symbiontic relations? In general you can say that these salts kill many of the soil microbes and they use up the carbon in the soil. Many soils become acid and lack oxygen. So many functions of life in the soil are lost. Krasil'nikov has collected a lot of studies on the role of soil microbes and their relation with higher plants (Krasil'nikov, 1958):

- The symbiontic soil microbes augment the resistance of plants to their pathogens in return for a.o. sugars;
- They make the food in the soil available for plants: nitrogen; phosphor; potassium; magnesium; trace elements etc. The metals become organically bound metals;
- They produce hormones and other plant stimulating compounds: auxins; gibberlins and other;
- And they split nitrogen from the air and make N compounds which plants can use;
- They feed the earthworms.

And research in organic agriculture has proven that the microbes, the worms and many other small creatures in the soil ensure that the structure in the soil is kept open: water and air can go into the soil and carbonic acid can go out. The carbonic acid supports in its turn the growth of the plants which catch the CO_2 that evaporates from the soil with their stomata (Reinau, 1927; Lundegardh, 1924). The soil particles are covered with a layer of slime by the microbes and the earth worms, which bind them together. A living soil can store much more water than soils devoid of life. And an open soil is able to let the excess water from the rains go through it. Potassium chloride makes 'concrete' from soils when too much is given (Khan, 2013). The same for sodium salts (Howard, 1943) and magnesium salts. Too much is detrimental.

In areas where there is little rain the salts accumulate in the topsoil. Like in Pakistan which has a lot of salinated areas. But also in the Netherlands we have many soils with too high electric conductivity through the salts we give in excess. There are soils in the Dutch horticulture which have so much elements in it that the plants can grow for years, without additional fertilizers. Some soils contain enough phosphor for thirty years continuous growth. These soils need only microbes to free these nutrients, e.g. mycorrhiza's. Chaboussouh developed the theory that a plant which can't convert reduced sugars and amino acids into complex sugars and proteins will be attacked by insects. Insects can't eat complex sugars or proteins (Chaboussouh, 2005). For a good conversion plants need enough macro elements like calcium and magnesium, and trace elements. And the role of sodium is – especially in dairy farming –underestimated. For cows grasses with enough sodium are a must. And they are fond of it (Chiy, Phillips, 1995).

Swerczek, an american veterinarian, saw that the fodder for the cows, horses and sheep has very often too much potassium and nitrate and too little sodium, magnesium and calcium. These animals developed what he called <u>the potassium nitrate syndrome</u>, a syndrome with a lot of health problems: tetany; infertiliy; skin lesions[*]; dead calves, lambs and foals; enteritis; mastitis; claw or hoof problems etc (Swerczek, 2002, 2012, 2018a, 2018b).

The quality of the cow milk in the Netherlands has gone down dramatically: less magnesium, manganese; selenium; iron; copper; less vitamin D; E; A and B. And probably also less vitamin K2 (Table 1).

[*] These lesions are in fact a consequence of low magnesium levels. Low through high K and/or high sodium (Bredon, Dugmore, 1985).

Table 1. Quality of the cow milk in the Netherlands, according to Agrifirm, Sprayfo and the Flemish Ministry of Agriculture

Cow milk in the Netherlands is at many dairy farms no longer suitable for the calves
The milk is too fat (it contains two times more fat than the calf needs). The calves are at risk of getting diarrhea. They can't metabolize the fat properly [too much omega 6 and too little omega 3).
The cow milk contains 1.5 times the amount of protein a calf needs. Too much urea in the milk is a risk.
The magnesium content should be twice as high (Flemish Ministry of agriculture)
The copper content is 8 times too low
The selenium content is 16 times too low
The iron content is 16 times too low
The manganese content is 33 times too low
The vitamin B1 content is too low;
The vitamin A is 2,5 times too low
The vitamin D3 is 10,3 times too low
The vitamin E content is 15 times too low, according to the Flemish Ministry of Agriculture.
The vitamin K2 content is problably much too low. But the milk industry doesn't measure it.

And more and more people who eat animal protein can't digest it completely, or correctly. Normally the liver is able to break down the proteins the body doesn't need. And the breakdown products – urea; phosphate – are eliminated through the kidneys. But the Liver of many people can't break down the proteins properly. Part of the proteins/amino acids pile up in the capillaries and the connective tissues. There they induce many protein storage diseases. The cells of the body don't get enough food, oxygen and water because of these proteins which block the passages of the capillaries and the connective tissues. And the waste products of the digestion and burning processes in the cells can't leave the connective tissues in time. Lothar Wendt who is the discoverer of this clogging, adviced for recovery to eat a. no more meat and other animal proteins for at least a month to six weeks, and b. then, when in the end the stacked proteins are removed from the body, to eat less animal protein anyhow, or not at all. To accelerate the elimination of the stacked proteins he also used blood letting (Wendt, 1983).

Lothar Wendt (1983) supposed that hereditary factors are responsible for the fact that the livers of many people are not able to digest animal protein properly. This statement can only be true if the genetic basis of all these people has changed in a very short time, which is not the case. The simple reason why livers are no longer able to digest animal protein fully is that the animals have another 'composition' of their bodies through bad food, and so their cells: macro elements in the meat and eggs are no more in balance; trace elements and vitamins are low or missing. Like in the milk in the Netherlands. The more complicated explanation is that the animal cells are missing part of their microzymas, the tiny microbes which Béchamp called mycrozymas (a contraction of micro and enzymes) (Douglas Hume, 1948). In fact all farm animals which we produce are sick – chronically ill, kept alive with antibiotics etc., but not dying a natural death from their diseases because they go to the butcher before. Dairy cows in the Netherlands become five years old on average.

Their microzymas or somatids have probably reached a growth phase above the third stage and have become parasites, because the animals become too acid. But, according to Ciftcioglu (2010) they do so already as nanobacteria, also before reaching the bacterial stage.

And the animals are presumably already reprogrammed during their fetal growth through imbalances in macro elements, and lack of trace elements and vitamins. In order to survive the fetus adapts itself to shortages and imbalances. Later in life this reprogramming shows its price. Pottenger (1937, 1939, 1946) found out in his cat-research that it takes three generations for complete recovering from feeding on bad food: pasteurised milk; heated flesh (Cropley, 2014). The theory of reprogramming during fetal growth is developed by (Barker, 2013). So for human fetuses it is the same. Barker came to the same conclusion for de-programming. It takes three generations.

Seelig (1981), Abraham (1982, 1990) and Schroll (1992) have shown that an imbalance between the serum electrolytes and the cell electrolytes is mostly caused by a shortage of magnesium. In the long run a shortage of magnesium causes the loss of potassium from the cells and an influx of sodium, calcium and protons into the cells. The electrolyte balans is disrupted. The proper functioning of the cells is at issue. This is one of the causes of heart diseases (Seelig, 1981; Abraham, 1982, 1990; Schroll, 1992).

And if the mitochondria in the cells are missing magnesium, the citric acid cycle is disturbed. After some time the cells can no longer use oxygen for the energy production. And the cells start fermenting pyruvic acid for energy production. Then the risk is there that cancer cells develop. Cancer cells don't use oxygen but ferment pyruvic acid into lactic acid. Warburg already discovered these facts (Warburg, 1956). He postulated that the disfunctioning of the mitochondria is at the base of cancer. But he didn't know magnesium was the key element for the proper functioning of the mitochondria.

"Warburg hypothesized that cancer growth is caused by tumor cells generating energy (as, e.g., adenosine triphosphate/ATP) mainly by anaerobic breakdown of glucose (known as fermentation, or anaerobic respiration). This is in contrast to healthy cells, which mainly generate energy from oxidative breakdown of pyruvate. Pyruvate is an end product of glycolysis, and is oxidized within the mitochondria. According to Warburg, hence, cancer should be interpreted as a mitochondrial dysfunction".

"Cancer, above all other diseases, has countless secondary causes. But, even for cancer, there is only one prime cause. Summarized in a few words, the prime cause of cancer is the replacement of the respiration of oxygen in normal body cells by a fermentation of sugar".

"Warburg continued to develop the hypothesis experimentally, and gave several prominent lectures outlining the theory and the data" (https://en.wikipedia.org/wiki/Otto_Heinrich_Warburg).

If the calcium/magnesium balance is too high for a longer period, then the soft parts of the body begin to calcify, and the bones and dents become weak. For the balance of the macro-elements I derived the following rules from the relevant literature for food and fodder in relation to the health of animals and men (Table 2).

Table 2. Rules for food and fodder

Ratio in the combined daily food and fodder	Optima	Regulation of:
Potassium/Sodium	2–4 (max 7 to 10 (?))	Acid base balance; water retention; blood pressure
Potassium/magnesium	2–5 (max 7)	Electrolyte balance; citric acid cycle; energy production; protein,carbohydrate and fat metabolism; impulse conduction;
Calcium/Magnesium	1–2	Uptake of calcium; regulation of calcium metabolism; bone health; (de)calcification of the weak tissues; electrolyte balance; health of the hearth, and of cells (cancer);
Calcium/Phosphor	1–3	Rickets; bone health; (de)calcification of bones and weak tissues; Stone formation; fertility;
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	Magnesium is necessary for electrolyte balance; energy production; impulse conduction; protein,carbohydrate and fat metabolism; for K/Na balance; Ca/Mg balance; Ca/P balance; breakdown of proteins, carbohydrate and fats; prevention of stone formation; health of vital organs (brains; hearth; liver; kidney; pancreas; stomach); the immune system; prevention of depression; aggression regulation; prevention of cancer; removal of heavy metals and fluorine; 600 enzymes are magnesium dependent;
K/(Ca+Mg) in MeQ	< 2–2,2	This measure is developed to see if cows are at risk of grass tetany

Magnesiumchloride prevents inflammation through viruses, bacteria and fungi. If people and animals get enough magnesiumchloride on a daily basis, vaccination is no longer necessary (Neveu, 2009).

Magnesiumchloride, in combination with selenium, manganese, vitamin C, vitamin A, vitamin B, vitamin K2, zinc, iodide and other trace elements and vitamins can stop cancer in its early phase (Delbet, 1945; Ramesha, 1990; Voss, 2010; Abraham, 2005; Diehl, 1954; Tromp, 1954).

Too much calcium makes rigid; too much magnesium makes soft (our hearth can stop beating if our magnesium intake is too high in combination with poorly functioning kidneys).

In those areas where the soil contains high levels of magnesium as in most African countries (Joy et al., 2014) and in parts of France, people have less cancer and less depressions (Delbet, 1945). Suicide was much lower in these magnesium rich areas in France (Robinet, 1934). In the area in France with the highest level of magnesium in the soil, in Espalion, only 1 or 2 persons per 100.000 inhabitants died from cancer per year (Robinet, 1932, 1939). Potassium fertilizers and high dosages of lime (calcium carbonate), ammonia, and phosphate fertilizers hinder the uptake of magnesium by plants. The fertilizer sodium chloride can help to restore the balance in English ryegrass (*Lolium perenne*). In field trials in England the optimum dose was 173 kg/ha (Chiy, Phillips, 1995). Through sodium chloride potassium in the ryegrass went down and sodium, calcium and magnesium went up. Cows prefer sodium rich grass. But not all grasses (e.g. timothy-grass) can take up sodium. And giving too much (or too little) sodium is however detrimental.

Now I will show the effects of artificial fertilizers and of inferior organic fertilizers on crops:

- Grasses;
- Potatoes;
- Tomatoes;
- Fruits;
- Take away food.

1. <u>Grasses:</u>

In the Netherlands grass is heavily fertilized with slurry, year after year, almost always without amendments of missing macro elements and trace elements (Figure 2).

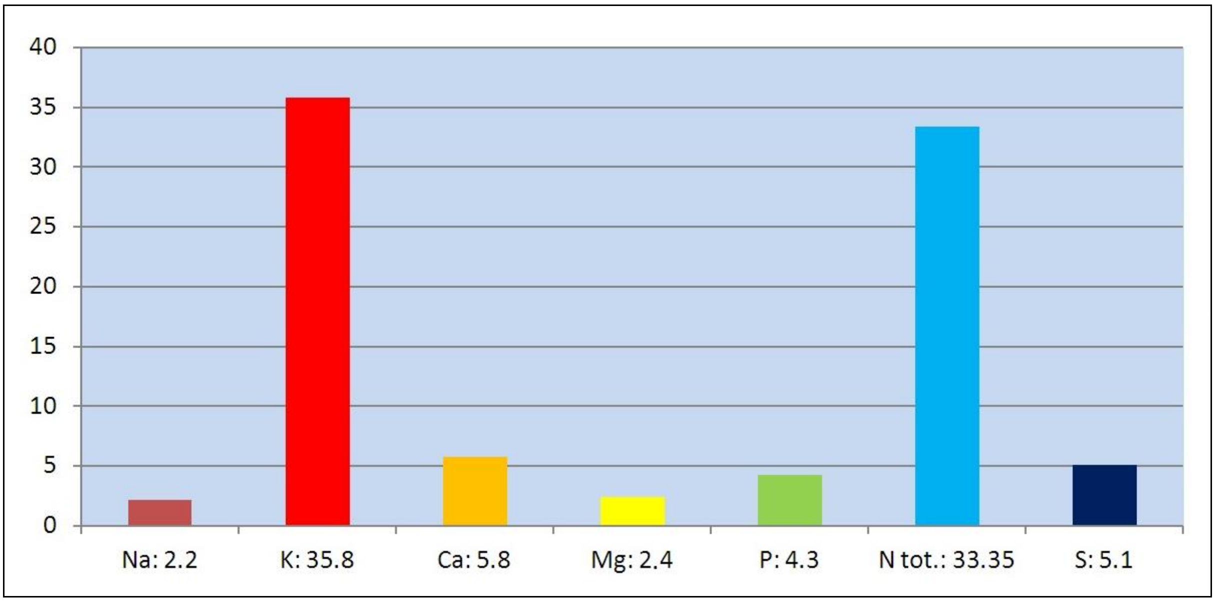


Fig. 2. Minerals and N in Dutch fresh grass (2014). Data from 60 conventional farms, g/kg DM Data from DMS

Conclusions:

➢ Potassium in this grass is far above the Dutch level for toxicity (30 g/kg DM) (CVB, 2005) and the American level for toxicity (20 g/kg DM) (Crawford, 2012).

➢ Sulphur is above the Dutch level for toxicity (CVB, 2005) and the American level for toxicity – University of California (Crawford, 2012), and University of Montana (Olson Rutz, 2014): 4. 2 and 3 gr/kg DM respectively.

In English Field trials (Chiy, Phillips, 1995) made a correction by fertilizing with sodium chloride:

➢ Their grass had a completely different balance (Figure 3).

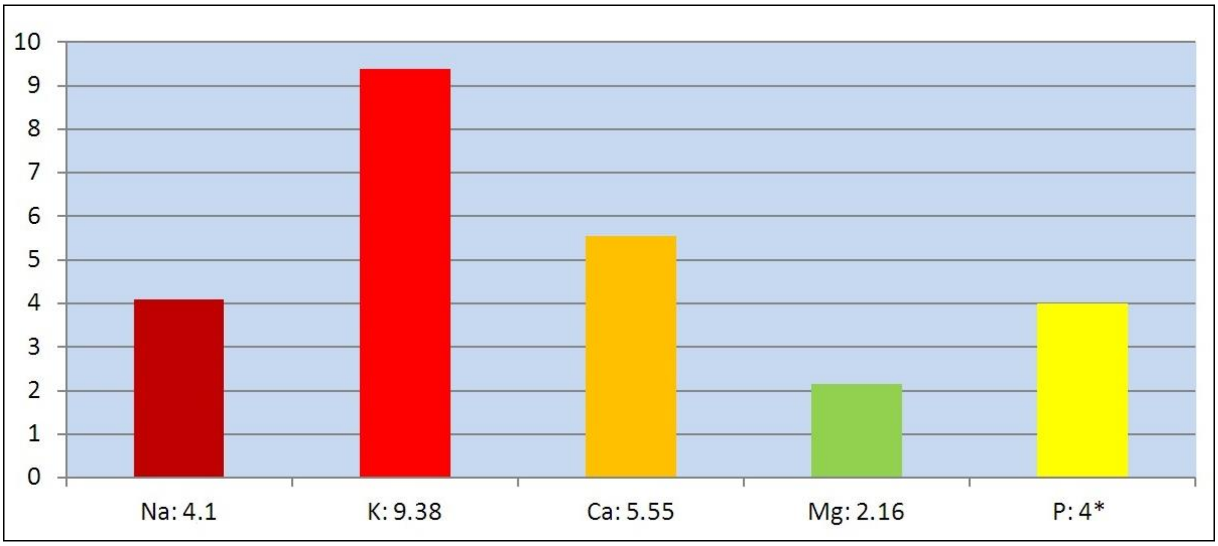


Fig. 3. Minerals in grass in a sodium trial of Chiy and Phillips (1995) (*P = estimated) (165 NaCl kg/ha)

How are the ratios of the Dutch grass and the grass of Chiy and Phillips compared with the optimal ratios (Table 3)?

Table 3. Ratios of the grass

Ratio	Optima	Dutch grass 2014	The grass of Chiy and Phillips (UK)
Potassium/**Sodium**	2–4 (max 7–10)	16.3	2.3
Potassium/magnesium	2–5 (max 7)	14.9	4.3
Calcium/Magnesium	1–2	2.4	2.56
Calcium/Phosphor	1–3	1.3	1.4
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.049	0.094
K/(Ca+Mg) in MeQ	< 2	1.9	0.52

Conclusion:

1. The Dutch grass is a health risk for the cattle;
2. The grass of Chiy and Phillips is almost measuring up to the standards. Some extra magnesium suffices. The health of the cows is not at risk. And as Chiy and Phillips stated: this grass is preferred by the cows;
3. Chiy and Phillips didn't measure sulphur.

2. Potatoes:

In 2012 The Dutch Louis Bolk institution did a trial to compare the effects of different fertilizer treatments on potato yield and potato quality (Burgt et al., 2012). In total they used thirteen treatments – organic fertilizers and inorganic fertilizers; slurry; and different compost types (CMC compost; pure vegetal composts; green composts) and different types of animal dung; and combinations. To have a good overview I selected 7 treatments. The other six don't deviate. And I calculated the ratios.

All the fertilizing systems which we apply in the Netherlands lead to comparable imbalances (Table 4).

Table 4. Potatoes

Ratio→ Treatment↓	K/Mg	K/Na	Ca/Mg	Ca/P	Mg/ (..)	K/(Ca+Mg) In Meq	N (g/kgdm)	Yield in tons/ha
Deep litter manure	25.5	230	0.77	0.23	0.033	5.41	8.8	28
Deep litter manure CMC	22.9	206	0.88	0.29	0.037	4.63	7.4	16
Deep litter manurecompost	22.7	>227	0.8	0.27	0.037	4.77	8.1	26.5
Artificial fertilizer	23	>207	1	0.34	0.037	4.46	8	24.5
Chicken dung + slurry	23.7	>213	0.88	0.29	0.036	4.79	8.8	26.5
GFT compost + slurry	24.2	>218	0.88	0.30	0.035	4.9	8.7	31.5
slurry	22.8	>205	0.88	0.32	0.037	4.61	8.1	25

Van iersel compost	22.4	202	0.88	0.29	0.037	4.54	6.9	16
Average	23.4	>200	0.87	0.29	0.036	4.76	8.1	24.25
Difference	Not great	Not great	Not great	Not great	small	There are differences	There are differences	great

- CMC is controlled microbial composting;
- GFT compost is compost prepared from residuals of vegetables, fruits and home gardens;
- Van iersel compost is compost made from wood residuals.

In the Table 5 you can find the averages of Table 4, compared with the optima of Table 2.

Table 5. Averages (Table 4) compared with the optima (Table 2)

Ratio	Optima	The average of the seven treatments:
Potassium/Sodium	2–4 (max 7–10)	>200
Potassium/magnesium	2–5 (max 7)	23.4
Calcium/Magnesium	1–2	0.87
Calcium/Phosphor	1–3	0.29
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.036
K/(Ca+Mg) in MeQ	< 2	4.76

Conclusions:
- For all the ratios the differences between the treatments are small;
- There are great differences in yields;
- The potatoes from all treatments constitute a health risk. K/Ca+Mg) in mEq is more than double the upper limit.

3. Tomatoes:
In Table 6 there are the ratios of cherry tomatoes, grown on rockwool from a dutch cherry tomato producer – so called quality tomatoes, and the ratios of average Dutch tomatoes.

Table 6. Ratios of cherry tomatoes

Ratio	Optima	Ratios of cherry tomatoes, grown on rockwool	Average Dutch tomatoes
Potassium/Sodium	2–4	131	133
Potassium/magnesium	2–5	63.7	33.2
Calcium/Magnesium	1–2	0.26	1.12
Calcium/Phosphor	1–3	0.29	0.34
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.015	0.026
K/(Ca+Mg) in MeQ	< 2	17.15	6.12

Conclusions:
- The cherry quality tomatoes are a serious risk for health, even more than the average tomatoes;
- The K/Ca+Mg) in mEq is more than eight times the safe upper limit for cherry tomatoes, and more than 3 times the safe upper limit for the average tomatoes;
- The potassium level of the cherry tomatoes is with 87 g/kg DM almost three times the Dutch upper limit (30 g/kg DM).

4. Fruits:
The average ratios in Dutch fruits are as follows (ratios of cherry tomatoes (Table 7).

Table 7. Ratios in fruits

Ratio	optima	Average ratios in Dutch fruits inclusive citrus fruits
Potassium/Sodium	2–4	198
Potassium/magnesium	2–5	16.5
Calcium/Magnesium	1–2	0.92
Calcium/Phosphor	1–3	0.58
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.052
K/(Ca+Mg) in MeQ	< 2	3.25

Conclusions:

- The average Dutch fruits are a serious risk for health, but less than the average tomatoes or the potatoes;
- The K/Ca+Mg) in mEq is too high but not that high as in tomatoes or potatoes;

The separate products is one thing, buth what do the Dutch people get on average as far as macro elements are concerned (Figure 4)?

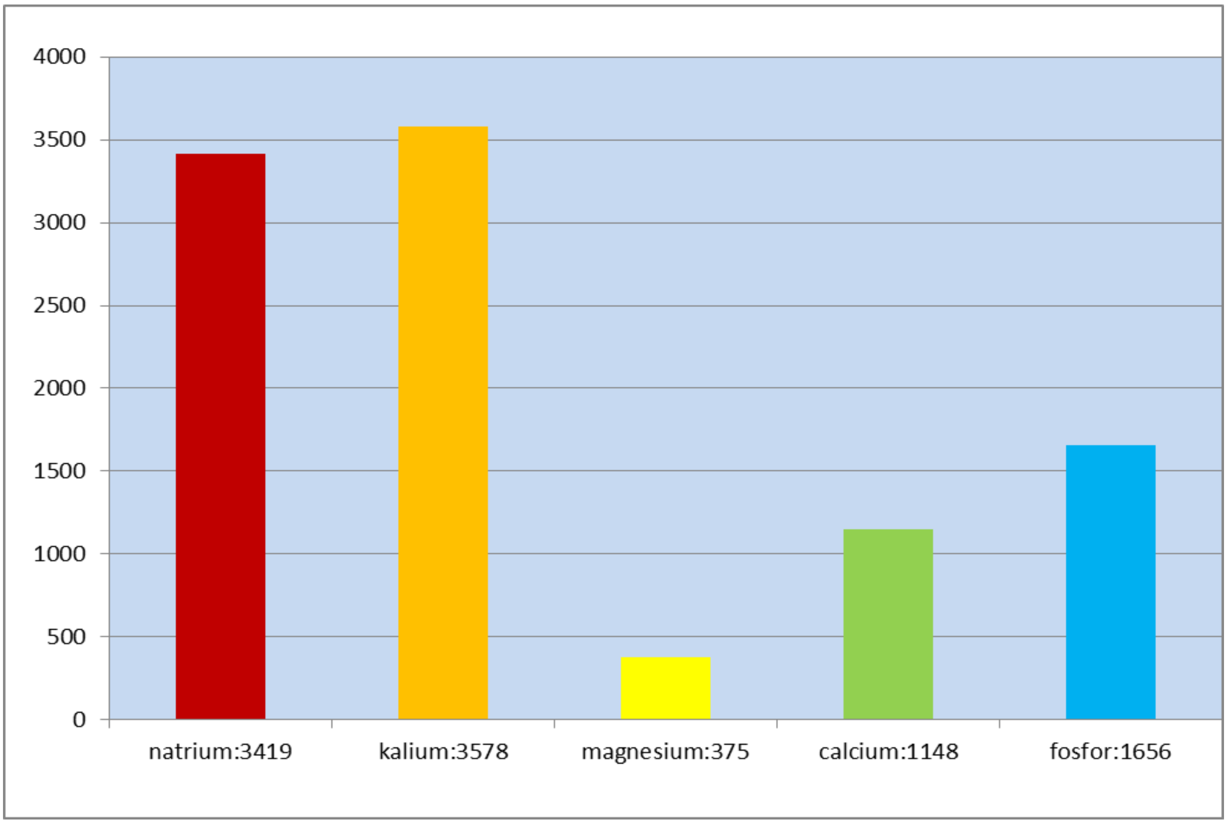


Fig. 4. The average mineral intake in the Netherlands, mg/day, 2007 – 2010
K/Na= 1; K/Mg= 9,5; Mg/(K+Ca+Na+P) = 0,038; Ca/P= 0,69; Ca/Mg=3

This is what we eat on average. But there is one complication: the phosphor here is from the food. But the food industry uses a lot of additional phosphor as taste enhancer. Finnish research estimates we get 10–50 % extra P, depending on what you eat or drink.

And calcium is high because we eat a lot of dairy products. Sodium is high because we use lots of salt. In fact we get even more calcium through supplements and food additives (Table 8).

Table 8. Ratios in Average Dutch food

Ratio	optima	Ratios in average Dutch food
Potassium/Sodium	2–4	1
Potassium/magnesium	2–5	9.5
Calcium/Magnesium	1–2	3
Calcium/Phosphor	1–3	0.69
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.038
K/(Ca+Mg) in MeQ	< 2	1

Complications: the intake of magnesium is low but the uptake of magnesium in the intestines is even much lower because high levels of calcium, potassium, and sodium diminish the uptake of magnesium. And at high levels of sodium and phosphor intake, extra magnesium is lost through the kidneys.

Another complication is that many people don't eat 'on average'. If you consume a lot of processed and refined food, then the intake of potassium, calcium and magnesium is even much lower. Then you have to live more or less on sodium, phosphor and nitrogen (see below).

Conclusions:

- 'On average' the potassium sodium balance is okay, but not for people who eat lots of processed or refined foods;
- But many people who eat processed and refined foods get too little potassium, calcium and magnesium, and too much sodium and phosphor;
- The calcium/phosphor balance is a risk for health for the average eaters, and even more for the people who eat foods and drinks with added phosphor (like in Cola);
- The calcium/magnesium ratio is too high. This increases the risk of heart diseases (Karppanen, 1981), calcification of the weak parts of the body, and of cancer;
- Mg/(K+Na+Ca+P) is much too low – a good basis for chronic diseases.

The case of refined and processed Foods.

I have collected the data on these Foods from the Dutch food website (RIVM Nevo online, 2015). *This is the official Dutch website which provides a lot of data regarding the composition of the foods in the Netherlands* (Figure 5).

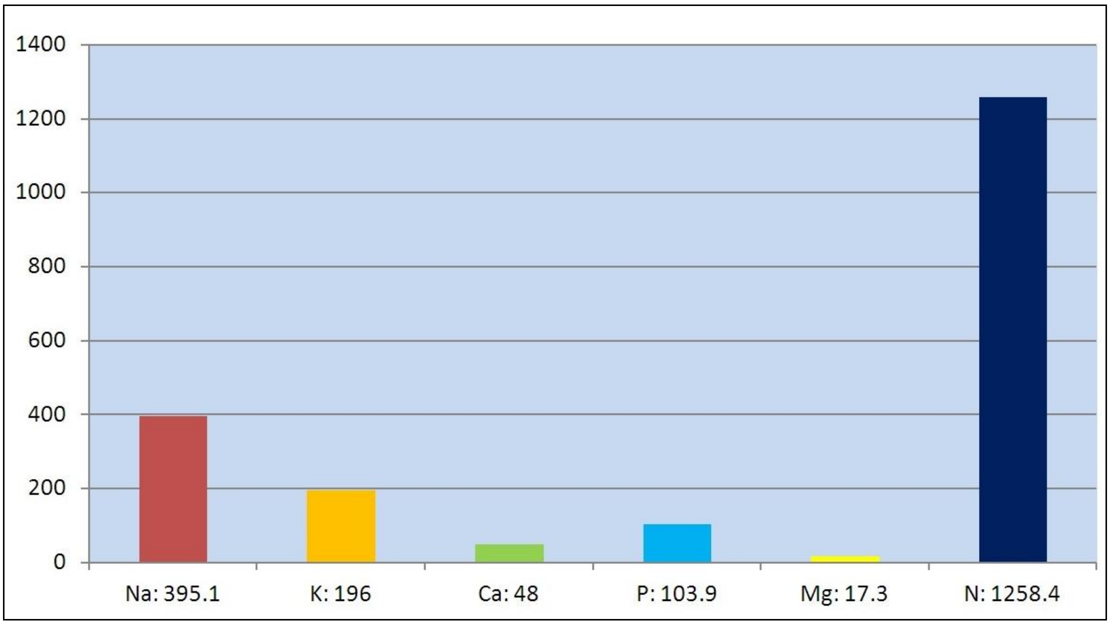


Fig. 5. The average mineral composition of four types of take away foods in the Netherlands. RIVM 2015, mg/100 g

The ratios in these processed Foods are as follows (Table 9).

Table 9. Ratios in processed Foods

Ratio in the combined daily food and fodder	optima	Ratios in four types of takeway foods
Potassium/Sodium	2–4	0.5
Potassium/magnesium	2–5	11.3
Calcium/Magnesium	1–2	2.77
Calcium/Phosphor	1–3	0.46
Mg/(K+Na+Ca+P)	0.15–0.25; min 0.10	0.023
K/(Ca+Mg) in MeQ	< 2–2.2	1.3

3. Conclusion

- Only the ratio K/(Ca+Mg) in MeQ is okay.
- The amount of N is high (but we don't know how much of it is Non Protein Nitrogen (NPN). Like for instance nitrate. In the Netherlands NPN is not measured on a regular base);
- NPN is a health risk if magnesium is too low.

People in the Netherlands get chronically ill because the food is not in balance.

So we need to rebalance the food through better fertilizing practises and less food processing and refining.

In another paper I will show that vermicomposting in combination with basaltic volcanic stone meal offers a better kind of fertilizing than the artificial fertilizers and the traditional composts and animal dungs like slurry and deep litter manure. Vermicomposts produce huge and very diverse numbers of microbes, and offer the plants the opportunity to select those elements they need. The microbes fall apart in the tiny forms mentioned above, and produce the elements for the plants as organic compounds, not as salts.The tiny microbial forms support the vitality of plants, animals and men.

References

Abraham, 1982 – *Abraham G.* (1982). The calcium controversy. *Journal of Applied Nutrition* 34(2).

Abraham, 1990 – *Abraham G.* (1990). A Total Dietary Program Emphasizing Magnesium Instead of Calcium. Effect on the Mineral Density of Calcaneous Bone in Postmenopausal Women on Hormonal Therapy. *The Journal of Reproductive Medicine* 35(5).

Abraham, 2005 – *Abraham G.* (2005). Iodine: The Universal Nutrient. *Townsend letter for Doctors & Patients* – DECEMBER 2005 [Electronic resource]. URL: www.townsendletter.com

Alexander-Jackson, 1956 – *Alexander-Jackson E.* (1956). Intracellular acid-fast microorganisms. *J. Amer. Med. Women's Ass.*, 11: 120-129.

Almquist, 1925 – *Almquist E.* (1925). Biologische Forschungen über die Bakterien Variation, Entwickelungszyklen, Sexualität, Artbildung, Lebenserhaltung, Epidemien. Stockholm P.A. Norstedt & Söner.

Altenburg, 1946 – *Altenburg E.* (1946*)*. The "Viroid" Theory in Relation to Plasmagenes, Viruses, Cancer and Plastids. *The American Naturalist*, 80(794): 559-567.

Barker, 2013 – *Barker D.* (2013). *Fetal origins of adult disease'* Chapter 8 in: 'Growing up in the UK – Ensuring a healthy future for our children'. *BMA Board of Science*, May.

Barr et al., 2013 – *Barr J.J. et al.* (2013). Bacteriophage adhering to mucus provide a non–host-derived immunity. *PNAS*, 110(26): 10775.

Béchamp, 1912 – *Béchamp A.* (1912). The blood and its third anatomical element. Application of the Microzymian theory of the living organization to the study of the anatomical and chemical constitution of the blood and to that of the phenomena of its coagulation and of its other spontaneous changes. London: Published by John Ouseley Limited, 6 Fleet Lane, Farringdon Street.

Bird, 1991 – *Bird C.* (1991). The Persecution and Trial of Gaston Naessens.Published by H.J. Kramer Inc. Tiburon Ca. [Electronic resource]. URL: https://www.amazon.com/Persecution-Trial-Gaston-Naessens-Immunologically/dp/0915811308

Bredon, 1985 – *Bredon R.M.R.* (1985). Dairying in Kwazulu-Natal: Mineral & Vitamin Nutrition Of Dairy Cattle. *Cedara Agricultural Development Institute, Province of Kwazulu Natal South Africa*.

Burgt et al., 2012 – *Burgt G. van der et al.* (2012). Mest Als Kans 2012: activiteiten en resultaten. Tussenrapportage project Bedrijfsoptimalisatie bemesting, BO-12.03-002-023, Ministerie Economische Zaken, Landbouw & Innovatie Publicatienummer 2012-044 LbP.

Cantwell, 1990 – *Cantwell A.* (1990). The cancer microbe: the Hidden Killer in Cancer, AIDS, and Other Immune Diseases, Aries Rising Press, Los Angeles.

Cantwell, 2003 – *Cantwell A.* (2003). The Russel body: the bacterial cause of cancer. Aries Rising Press, Los Angeles.

Chaboussouh, 2005 – *Chaboussouh F.* (2005). Healthy Crops: A New Agricultural Revolution. Jon Carpenter Publishing.

Chiy, Phillips, 1995 – *Chiy Pc., Phillips Cjc.* (1995). Nutritional preference of dry pregnant dairy cows for natrophilic pasture of varying metal concentration. *Annales de zootechnie, INRA/EDP Sciences,* 44(Suppl1): 114–114.

Cho et al., 2007 – *Cho H. et al.* (2007). Self-organization in high-density bacterial colonies: efficient crowd control. *PLoS Biol,* 5(11): e302. DOI: 10.1371/journal.pbio.0050302

Ciftçioğlu, 2010 – *Çiftçioğlu N.* (2010). Pathological Calcification and Replicating Calcifying-Nanoparticles: General Approach and Correlation. *Pediatric Research,* 67: 490–499. DOI: 10.1203/PDR.0b013e3181d476ce.

Crawford, 2012 – *Crawford G.* (2012). Beef animal health: avoiding Mineral Toxicity in Cattle, University of Minnesota, Beef team, extension.

Cropley, 2014 – *Cropley C.* (2014). Overcooking Protein: The Effects of Cooking on Animal Protein by Francis Pottenger Jr., M.D.

CVB, 2005 – Centraal veevoederbureau (2005). (Central office for cattle feeding: the Netherlands). “Handleiding Mineralenvoorziening Rundvee, Schapen, Geiten”. Commissie Onderzoek Minerale Voeding.

Delbet, 1945 – *Delbet P.* (1945). Politique préventive du cancer, Sciences libres 2009. [original edition: 1945].

Diehl, 1954 – *Diehl J.C.* (1954). First Report on the geographical and Geological Distribution of Carcinoma in the Netherlands. Foundation for the Study of Psycho-physics. Oegstgeest, Holland.

Diller, 1962 – *Diller I.C.* (1962). Growth and morphologic variability of pleomorphic, intermittently acid-fast organisms isolated from mouse, rat, and human malignant tissues. *Growth,* 26: 181-209.

Douglas Hume, 1948 – *Douglas Hume E.* (1948). Bèchamp ou Pasteur? Un chapitre perdu de l'histoire de la biologie: basé sur un manuscrit de Montagu R. Leverson. Editeur: Paris: Librairie Le Françoi̧s, 1948.

Hiller, 2018 – *Hiller S.* (2018). Dr Gaston Naessens. [Electronic resource]. URL: https://cancer-cures-plus.com/persecuted-heroes/dr-gaston-naessens/ (date of access 2018/02/05).

Howard, 1943 – *Howard A.* (1943). An Agricultural testament. Oxford University Press, New York and London.

Joy et al., 2014 – *Joy E.J.M. et al.* (2014). Dietary mineral supplies in Africa. *Physiologia Plantarum,* 151: 208–229.

Kajander et al., 1998 – *Kajander E.O. et al.* (1998). Nanobacteria: an alternative mechanism for pathogenic intra-and extracellular calcification and stone formation. *Proc. Nat. Acad. Sci.,* 95(14): 8274–8279.

Karppanen, 1981 – *Karppanen H.* (1981). Epidemiological studies on the relationship between magnesium intake and cardiovascular diseases. Department of Pharmacology University of Helsinki.

Khan, 2013 – *Khan S.* (2013). The potassium paradox: Implications for soil fertility, crop production and human health. *Renewable Agriculture and Food Systems,* 29(1): 3–27. DOI: 10.1017/S1742170513000318

Klieneberger-Nobel, 1949 – *Klieneberger-Nobel E.* (1949). On streptobacillus moniliformis and the filtrability of its l-form. *The Journal of hygiene,* 47(4): 393–5.

Klieneberger-Nobel, 1951 – *Klieneberger-Nobel E.* (1951). Filterable forms of bacteria. *Bacteriol Rev.,* 15(2): 77–103.

Krämer, 2012 – *Krämer E.* (2012). Leben und Werk von Prof. Dr. Phil. Günther Enderlein. Reichl Verlag St Goar. 4e Auflage.

Krasil'nikov, 1958 – *Krasil'nikov N.* (1958). Soil microorganisms and higher plants. Academy of Sciences of the USSR Publishing, Moscow.

Kutikhin et al., 2012 – *Kutikhin A.G. et al.* (2012). The role of calcifying nanoparticles in biology and medicine. *Int J Nanomed,* 7: 339–350.

Livingston, 1947 – *Livingston V.* (1947). Microorganisms associated with Neoplasms. *New York Microscopial Society Bulletin,* 2 (2).

Livingston-Wheeler, 1977 – *Livingston-Wheeler V.* (1977). The Microbiology of Cancer. Livingston-Wheeler Medical Clinic, edited and compiled by Virginia Livingston Wheeler and Owen Webster Wheeler, San Diego [Electronic resource]. URL: https://trove.nla.gov.au/work/12190271?q&versionId=14381615

Lundegardh, 1924 – *Lundegardh H.* (1924). Der Kreislauf der Kohlensäure in der Natur. Ein Beitrag zur Pflanzenökologie und zur landwirtschaftlichen Düngungslehre. Gustav Fischer.

Mattman, 1994 – *Mattman L.* (1994). Cell Wall Deficient Forms: Stealth Pathogens. *American Journal of Clinical Pathology,* 101(4 – 19940401): 549.3-549

Naessens, 1995 – *Naessens G. et al.* (1995). Do no harm: the scientific, ethical, legal and spiritual revelation of somatidian orthobiology and 714X. Rochester, NY: Writers and Research, Inc.

Neveu, 2009 – *Neveu A.* (2009). Le chlorure de magnésium dans les maladies infectieuses. Editor: Sciences libres, Bordeaux.

Olson Rutz, 2014 – *Olson Rutz K.* (2014). Phosphorus, potassium, sulfur and micronutrients. Department of Land Resources and Environmental Sciences, Montana State University, Bozeman.

Pottenger, 1937 – *Pottenger F.M.* (1937). Clinical and Experimental Evidence of Growth Factors in Raw Milk*, Certified Milk.*

Pottenger, 1939 – *Pottenger F.M.* (1939). Heat Labile Factors Necessary for the Proper Growth and Development of Cats. *The Journal of Laboratory and Clinical Medicine,* 25(3): 238–240.

Pottenger, 1946 – *Pottenger F.M.* (1946). The Effect of Heat Processed Foods and Vitamin D Metabolized Milk on the Structures of Experimental Animals. *American Journal of Orthodontics and Oral Surgery,* 32(8): A467,IN1,A475-A474,IN4,A485. DOI: https://doi.org/10.1016/0096-6347(46)90180-9

Pradeu, 2016 – *Pradeu T.* (2016). Mutualistic Viruses and the Heteronomy of Life. Studies in History and Philosophy of Biological and Biomedical Sciences. [Electronic resource]. URL: http://www.sciencedirect.com/science/article/pii/S1369848616300012

Ramesha, 1990 – *Ramesha A.* (1990). Chemoprevention of 7,12-dimethylbenz[a]anthracene-induced mammary carcinogenesis in rat by the combined actions of selenium, magnesium, ascorbic acid and retinyl acetate. *Japanese journal of cancer research: Gann,* 81(12): 1239–46.

Reinau, 1927 – *Reinau P.* (1927). Praktische KohlensäureDüngung in Gärtnerei und Landwirtschaft. Berlin Verlag von Julius Springer.

RIVM Nevo online, 2015 – *RIVM Nevo online* [Electronic resource]. URL: https://nevo-online.rivm.nl/

Robinet, 1932 – *Robinet L.* (1932). Terrains magnésiens et cancer. *Communication á l'Académie de Médecine.*

Robinet, 1934 – *Robinet L.* (1934). Suicides, tuberculose, senilité et terrains magnésiens. *Bulletin de l'Académie de medicine,* III: 501–509.

Robinet, 1939 – *Robinet L.* (1939). Terrains magnésiens et cancer. *Communication á l'Académie de Médecine.*

Rusch, 1968 – *Rusch H.P.* (1968). Bodenfruchtbarkeit. Organischer Landbau Verlag.

Russel, 1890 – *Russell W.* (1890). An Address on a Characteristic Organism of Cancer. *British Medical Journal,* 2 (1563): 1356–1360.

Schanderl, 1947 – Schanderl H. (1947). Botanische Bakteriologie und Stickstoffhaushalt der Pflanzen auf neuer Grundlage. Stuttgart Verlag Eugen Ulmer.

Schroll, 1992 – *Schroll A.* (1992). Importance of magnesium for the electrolyte homeostasis – an overview. Deutsches Herzzentrum München, KIinik für Herz- und Gefaßchirugie, Lothstr. 1 1, D-80335 München, Germany.

Seelig, 1981 – *Seelig M.* (1981). Magnesium Requirements in Human Nutrition. *Magnesium-Bulletin,* 3 (Suppl 1a).

Seibert, 1972 – *Seibert F.B. et al.* (1972). Bacteria in tumors. *Trans. NY Acad. Sci.,* 34(6): 504–533.

Swerczek, 2002 – *Swerczek T.W.* (2002). Saprotrophic Fungi and Bacteria and Commensal Bacteria that Infect Frost-Damages Pastures may be Contributing to Gut Microbial Overgrowth and Lesions Associated with the Mare Reproductive Loss Syndrome. *J. of Equine Veterinary Science,* 6: 234-237.

Swerczek, 2012 – *Swerczek T.W.* (2012). Nitrate toxicity and sodium deficiency inducing mineral and electrolyte imbalances associated with fetal and neonatal loss in herbivores and musculoskeletal abnormalities in foals. University of Kentucky, USA.

Swerczek, 2018a – *Swerczek T.W.* (2018a). Sodium for the Prevention of Grass Tetany and Fetal Losses Associated with Nitrate Toxicosis in Herbivores. *Nutri Food Sci. Int. J.,* 8(1): NFSIJ.MS.ID.555728. DOI: 10.19080/NFSIJ.2018.08.555728

Swerczek, 2018b – *Swerczek T.W.* (2018b). *Nitrate Toxicity, Sodium Deficiency and the Grass Tetany Syndrome* [Electronic resource]. URL: www.growersmineral.com/grass tetany (date of access 2018/12/05).

Tromp, 1954 – *Tromp S.* (1954). Statistical study of the possible relationship between mineral constituents in drinking-water and cancer mortality in the Netherlands (period 1900-1940). *British journal of cancer,* 8(4): 585–94.

Visser, 2010 – *Visser J.* (2010). Down to earth : a historical-sociological analysis of the rise and fall of 'industrial' agriculture and of the prospects for the re-rooting of agriculture from the factory to the local farmer and ecology. PhD thesis Wageningen University.

Voss, 2010 – *Voss R.* (2010). Dr. Maynard Murray's Story: sea minerals cure, Acres USA October, 2010.

Warburg, 1956 – *Warburg O.* (1956). On the Origin of Cancer Cells. *Science,* 123(3191): 309-314.

Wendt, 1983 – *Wendt L.* (1983). Gesund werden durch Abbau von Eiweißüberschüssen. Schnitzer Verlag, Schwarzwald.

Yaghobee, 2015 – *Yaghobee S.* (2015). What are the nanobacteria? *Biotechnology & Biotechnological Equipment*, 29(5): 826-833. DOI: 10.1080/13102818.2015.1052761